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FINAL PHASE 1 RESOURCE CONSERVATION AND RECOVERY ACT FACILITY
INVESTIGATION VOLUME 1 NS MAYPORT FL
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ABB ENVIRONMENTAL SERVICES

**VOLUME I: RESOURCE CONSERVATION AND RECOVERY ACT
(RCRA) FACILITY INVESTIGATION
PHASE 1**

**U.S. NAVAL STATION
MAYPORT, FLORIDA**

UIC: N60201

Contract No. N62467-89-D-0317

Prepared by:

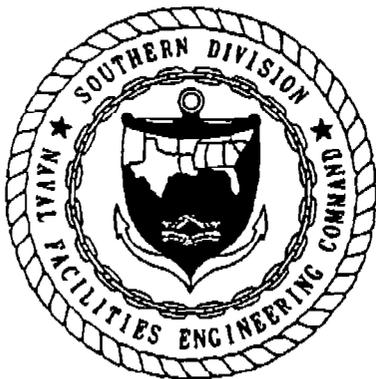
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FOREWORD

In order to meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense (DOD) initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Installation Restoration (IR) program. This program complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA). The acts, passed by Congress in 1980 and 1986, respectively, established the means to assess and clean up hazardous waste sites for both private-sector and Federal facilities. These acts are the basis for what is commonly known as the Superfund Program.

Originally, the Navy's part of this program was called the Navy Assessment and Control of Installation Pollutants (NACIP) program. Early reports reflect the NACIP process and terminology. The Navy eventually adapted the program structure and terminology of the standard IR program.

The IR program is conducted in several stages.

- The Preliminary Assessment (PA) identifies potential sites through record searches and interviews.
- A Site Inspection (SI) then confirms which areas contain contamination, constituting actual "sites". (Together, the PA and SI steps were called the Initial Assessment Study (IAS) under the Navy's old NACIP program.)

EXECUTIVE SUMMARY

ABB Environmental Services, Inc., under the Comprehensive Long-term Environmental Action, Navy (CLEAN) Contract, No. N62467-89-D-0317, is conducting a Resource Conservation and Recovery Act (RCRA) Facility Investigation on behalf of the U.S. Navy at the Naval Station (NAVSTA) Mayport. This investigation is being conducted in accordance with the Hazardous and Solid Waste Amendment (HSWA) permit identification No. FL9 170 024 260, issued by the U.S. Environmental Protection Agency (USEPA) on March 25, 1988. This draft RCRA Facility Investigation (RFI) report presents the findings, conclusions, and recommendations for Phase 1 of the RFI at NAVSTA Mayport.

NAVSTA Mayport is located in Jacksonville, Florida, in northeastern Duval County on the south shore of the confluence of the St. Johns River and the Atlantic Ocean. A RCRA Facility Assessment (RFA) for NAVSTA Mayport was conducted by the USEPA Region IV in 1989. The RFA identified 56 Solid Waste Management Units (SWMUs) and two Areas of Concern (AOC) at NAVSTA Mayport. Fifteen of these SWMUs were determined not to require further action. Twenty-three of the remaining SWMUs were determined to require further investigation. The remaining 18 SWMUs were determined to require an RFI. Of these 18 SWMUs, 17 had been previously identified in the permit. This permit required that an RFI be conducted at these 17 SWMUs. The additional SWMU determined by the USEPA during the RFA to require a RFI was the Building 1600 Blasting Area.

Due to the number of SWMUs, the diversity of their past and/or present operations, and the magnitude of the permit requirements, the USEPA recommended that a phased approach be used to implement the RFI and other corrective action activities. A Corrective Action Management Plan (CAMP; RFI Workplan; Appendix F; October 1991) was prepared in order to describe the strategy to implement the RCRA Corrective Action Program at NAVSTA Mayport. The CAMP identified operational groups of SWMUs and ranked them by their estimated risk to human health and the environment.

Phase 1 of the RFI addresses the Group I SWMUs. Although it was not identified as an SWMU in the HSWA permit, Building 1600 Blasting Area has been included in the Phase 1 RFI, as recommended in the RFA. The other Groups of SWMUs will be addressed in subsequent phases of the RFI as described in the CAMP. The following sites are identified as SWMUs in the HSWA permit and are included in the RFI at NAVSTA Mayport.

Group	Phase	SWMU	Description
I	1	2	Landfill B
		3	Landfill D
		4	Landfill E
		5	Landfill F
		13	Old Fire Training Area
		22	Building 1600 Blasting Area

these sediment samples near SWMU 5 also had detectable levels of mercury near quantitation limits. Pentachlorophenol was reported near quantitation limits for one of these two samples. The duplicate of this sample did not report pentachlorophenol. DDT, DDD, and DDE were also found in sediment samples.

A Corrective Measure Study is not recommended for the Group I SWMUs. Field and laboratory data do not indicate releases of contamination from the Group I SWMUs that would warrant a Corrective Measures Study. Data does identify areas, however, where interim measures and additional investigation are recommended.

- Soil contaminated with PCBs at SWMU 2 should be delineated and removed for treatment and disposal. Residual contamination that may present a low, long-term threat should be covered with clean fill or other engineered controls.
- An additional round of groundwater samples from the Group I monitoring wells should be collected. These samples should be analyzed for a subset of the Appendix IX Groundwater Monitoring List chemicals based on Phase 1 findings. Although general water quality in the surficial aquifer prevents potable use of groundwater, an additional sampling round will help confirm whether the observed chemicals in groundwater are random occurrences or indicate a release from the Group I SWMUs.
- Additional sediment samples upstream of locations MPT-2-SD-4, MPT-2-SD-5, and MPT-2-SD-9 should be collected to confirm if the source of PAH, pentachlorophenol, DDT (and by-products), and mercury are from SWMUs 4 and 5.
- Because of the low concentrations and frequency of detection of chemicals in soils, groundwater, and sediments, it is recommended that more background samples be collected during Phase 2. The specific number of background samples will be proposed in an addendum to the Workplan. In particular, the range of background concentrations for arsenic in groundwater and soil should be determined for the Mayport area.

The Phase 1 RFI Report for the Group I sites consists of the following volumes:

- Volume I, Phase 1 RFI Report
- Volume II, Appendices A, B, C, D, and E
 - Boring Logs
 - Hydrological Data
 - KBN Biological Inventory Report
 - Laboratory Data Summary Tables
 - Validation Summary Narratives

SWMU numbering and nomenclature are in accordance with the USEPA RFA, September 1989. Existing well and sample location designations were defined earlier during the Navy Installation Restoration (IR) program investigations. For consistency, the same well and sample location designation scheme will be maintained. Therefore, well and sample designations may vary from SWMU numbers. Navy IR program site numbers and SWMUs will be cross referenced as needed.

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
AFFF	Aqueous Film Forming Foam
AIMD	Aircraft Intermediate Maintenance Department
AOC	area of concern
APHA	American Public Health Association
ASTM	American Society of Testing and Materials
bls	below land surface
BOD ₅	5-day biochemical oxygen demand
CAA	Clean Air Act
CaCO ₃	calcium carbonate
CAMP	Corrective Action Management Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CLP	Contract Laboratory Program
cm	centimeter
CO	Corporate Officer
COC	chemical of concern
CVAA	cold vapor atomic absorption
CPF	carcinogen potency factors
CRDL	Contract Required Detection Limits
CRP	Community Relations Plan
CSF	carcinogen slope factor
CWA	Clean Water Act
°C	degrees centigrade
DFM	diesel fuel, marine
DO	dissolved oxygen
DOT	Department of Transportation
DQO	data quality objectives
EA	ecological assessment
EIC	Engineer in Charge
EP	equilibrium partitioning
EPTOX	extraction procedure toxicity
ESD	Environmental Services Division
ESE	Environmental Science and Engineering
ESI	Expanded Site Investigation
°F	degrees Fahrenheit
FAC	Florida Administrative Code
FDER	Florida Department of Environmental Regulation
FDNR	Florida Department of Natural Resources
FEMA	Federal Emergency Management Agency
FPDWS	Florida Primary Drinking Water Standards

GLOSSARY (Continued)

FTC	Fleet Training Center
ft/d	feet per day
GC	gas chromatograph
GC/MS	gas chromatograph/mass spectrometer
g/d/ft	gallon per day per foot
GFAA	graphite furnace atomic absorption
HASO	Health and Safety Officer
HASP	Health and Safety Plan
HEA	Human and Environmental Assessment
HEED	Health and Environmental Effects Document
HEEP	Health and Environmental Effects Profile
HI	Hazard Index
HSA	hollow stem auger
HSWA	Hazardous and Solid Waste Amendments of 1984
IAS	Initial Assessment Study
ICP	inductively coupled plasma
ICWW	Intracoastal Waterway
ID	inner diameter
IDL	Instrument Detection Limit
IDW	investigative derived wastes
IR	Installation Restoration
IRIS	Integrated Risk Information System
JTU	Jackson Turbidity Unit
k/m	kilometers per hour
LCS	laboratory control plasma
l/day	liters per day
MCL	maximum contaminant level
mgd	million gallons per day
μg/l	microgram per liter
μg/kg	microgram per kilogram
mg/l	milligrams per liter
mg/kg	milligrams per kilogram
ml	milliliter
mm	millimeter
mph	miles per hour
MPT	Mayport
MS/MSD	matrix spike/matrix spike duplicate
msl	mean sea level
NACIP	Navy Assessment and Control of Installation Pollutants
NADEP	Naval Aviation Depot
NAPL	nonaqueous phase liquid
NAS	Naval Air Station

GLOSSARY (Continued)

NAVSTA	Naval Station
NEESA	Naval Energy and Environmental Support Activity
NGVD	National Geodetic Vertical Datum of 1929
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NSC	Naval Supply Center
OWTP	Oily Waste Treatment Plant
OVA	organic vapor analyzer
PAH	polynuclear aromatic hydrocarbon (also, polycyclic aromatic hydrocarbon)
PARCC	precision, accuracy, representativeness, comparability, and completeness,
PCB	polychlorinated biphenyl
PM	Program Manager
PPE	personal protective equipment
PVC	polyvinyl chloride
QA	quality assurance
QAO	Quality Assurance Officer
QAP	Quality Assurance Project
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act of 1976, as amended
RFA	RCRA Facility Assessment
RfD	reference dose
RFI	RCRA Facility Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RRF	Relative Response Factor
RSD	risk-specific dose
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SAS	Special Analytical Services
SCS	Soil Conservation Service
SDG	Sample Delivery Group
SDWA	Safe Drinking Water Act
SOUTHNAV- FACENCOM	Southern Division, Naval Facilities Engineering Command
SI	Site Inspection
SIMA	Shore Intermediate Maintenance Activity
SMP	Site Management Plan
SOP	Standard Operating Procedure
SOW	Statement of Work
SPHEM	Superfund Public Health Evaluation Manual
SQC	Sediment Quality Criteria

GLOSSARY (Continued)

STORET	Storage and Retrieval of Water Quality Information
SUPSHIP	Supervisor of Shipbuilding
SVOC	semivolatile organic compound
SWDA	Solid Waste Disposal Act
SWMU	Solid Waste Management Unit
TBC	to be considered
TCL	target compound list
TD	Technical Director
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TOC	total organic carbon
TOM	task order manager
TRB	Technical Review Board
TSCA	Toxic Substances Control Act
TSS	Total Suspended Solids
UCL	Upper Confidence Limit
USACE	U.S. Army Corps of Engineer
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
USCS	Unified Soil Classification System
USSCS	Soil Conservation Service
USDA	U.S. Department of Agriculture
VOC	Volatile organic compound
VSI	Visual Site Inspection
WOW	We-Cycle Office Wastepaper
YTD	Year to date
ZHE	Zero Headspace Extraction

1.0 INTRODUCTION

This report presents a summary of field activities, field data, laboratory data, findings, conclusions, and recommendations for Phase 1 of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the U.S. Naval Station (NAVSTA), Mayport, Florida. ABB Environmental Services, Inc. (ABB-ES) conducted the Phase 1 RFI on behalf of the Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) under contract number N62467-89-D-0317. Due to the number and complexity of investigation sites [solid waste management units (SWMUs)], the RFI at NAVSTA Mayport is being conducted in phases. This RFI report addresses the Group I SWMUs investigated as part of Phase 1 of the RFI.

The Phase 1 RFI was conducted at NAVSTA Mayport in compliance with the requirements of the Hazardous and Solid Waste Amendments (HSWA) permit issued March 25, 1988, and the approved Corrective Action Management Plan (U.S. Navy, 1991a). The following sites have been identified as SWMUs and are included in the RFI at NAVSTA Mayport. Phase 1 of the RFI addresses Group I SWMUs. The other Groups will be addressed in subsequent phases of the RFI as described in the Corrective Action Management Plan.

Group	Phase	SWMU	Description
I	1	SWMU 2	Landfill B
		SWMU 3	Landfill D
		SWMU 4	Landfill E
		SWMU 5	Landfill F
		SWMU 13	Old Fire Training Area
		SWMU 22	Building 1600 Blasting Area
II	2	SWMU 6	Waste Oil Pit
		SWMU 7	Oily Waste Treatment Plant Sludge Beds
		SWMU 8	Oily Waste Treatment Plant Percolation Pond
		SWMU 9	Oily Waste Treatment Plant
		SWMU 10	RCRA Hazardous Waste Storage Area
		SWMU 11	Fuel Spill Area
		SWMU 12	Neutralization Basin
		SWMU 15	Old Pesticide Handling Area
		SWMU 16	Old Transformer Storage Yard
III	3	SWMU 1	Landfill
		SWMU 14	Mercury-Oily Waste Spill Area
		SWMU 17	Carbonaceous Fuel Boiler

1.1 BACKGROUND. The NAVSTA Mayport, Florida, was commissioned in 1942 on approximately 700 acres of land. The original mission of the station included use by patrol craft, target boats, and rescue boats. The station was placed in caretaker status from 1946 to 1948. In 1948 the station reopened, and in 1952 an aircraft carrier was assigned to the station. NAVSTA Mayport is presently the homeport for one aircraft carrier and various other surface ships and now occupies more than 3,400 acres. A Naval Air Station is also located on Naval Station Mayport. Naval Station Mayport supports the surface fleet, and Naval Air Station Mayport supports naval air operations. For the purposes of this

document, Naval Station Mayport will refer to both commands because they share common facilities. General wastes generated by the base are those normally associated with ship, on-shore maintenance, and flight operation activities.

Eighteen SWMUs have been identified under permit by the U.S. Environmental Protection Agency (USEPA) at NAVSTA Mayport. Under provisions of the HSWA of 1984, permit identification number FL9 170 024 260 was issued by Region IV USEPA on March 25, 1988, that requires an RFI to determine the nature and extent of releases and potential pathways of contamination emanating from these sites via soil, sediments, surface water, or groundwater.

1.2 PURPOSE. This RFI report describes: (1) the Phase 1 data gathering activities at the Group I SWMUs (2, 3, 4, 5, 13, and 22), (2) their sources of possible contaminants, (3) nature and extent of hazardous constituents, (4) actual or potential receptors, and (5) risk assessments, which are presented in the Health and Environmental Assessment (HEA), Chapter 5.0. The HEA evaluates the potential impacts of releases of contaminants at NAVSTA Mayport on human and ecological receptors. The need for a Corrective Measures Study is determined based on the HEA evaluation and conclusions.

1.3 SCOPE. Phase 1 RFI field activities occurred between January 1992 and April 1992. Field activities at the Group I SWMUs during Phase 1 included the following tasks:

- monitoring well and piezometer installation;
- borehole soil sample collection;
- surface soil sample collection;
- surface water sample collection;
- sediment sample collection;
- groundwater sample collection;
- monitoring well, piezometer, and sample location topographic survey;
- *in-situ* slug testing of aquifer properties at monitoring wells and piezometers;
- tidal studies of selected monitoring wells and piezometers;
- monthly groundwater elevation measurements (February, March, and April, reported);
- biological inventory of terrestrial and aquatic habitats; and
- laboratory analyses of selected Appendix IX Groundwater Monitoring List Compounds (40 Code of Federal Regulations [CFR] 264).

Table 1-1 summarizes the number of monitoring wells and piezometers installed at or near each Group I SWMU. Table 1-2 summarizes the type of samples, number of samples, and type of laboratory analyses conducted during the Phase 1 investigations. Tables 1-3 through 1-6 presents the selected Appendix IX Groundwater Monitoring List (40 CFR 264) compounds analyzed during this investigative phase. Selected groundwater samples were also analyzed by USEPA Method 8010 in order to obtain detection limits compatible with State of Florida Primary Drinking Water Standards.

As required by Permit Condition II.C.3. and Section I.B.2. of Appendix A of the HSWA Permit, all methods of sample analyses followed USEPA document SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1986). To assure that the data collected during the RFI meet the investigative objectives, the

**Table 1-1
Summary of Group I Piezometer and Monitoring Well Installations**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU Number	Piezometer and Monitoring Well No.	Phase	Diameter (inches)	Total Depth (feet)	Screened Interval (feet bis)
2	MPT-2-5	ESI	2	10	3 - 10
	MPT-2-9S	ESI	2	11	3 - 10
	MPT-2-9D	ESI	2	25	15 - 25
	MPT-2-10	ESI	2	15	5 - 10
	MPT-2-P5	Phase 1 RFI	2	11	6 - 11
3	MPT-2-6	ESI	2	10	3 - 10
	MPT-2-8	ESI	2	10	3 - 10
	MPT-2-MW16DD	Phase 1 RFI	4	100	90 - 100
	MPT-2-MW16S	Phase 1 RFI	2	12	2 - 12
4	MPT-2-1	ESI	2	10	3 - 10
	MPT-2-3	ESI	2	15	5 - 15
	MPT-2-7S	ESI	2	12	3.5 - 10.5
	MPT-2-7D	ESI	2	25	15 - 25
	MPT-2-P1	Phase 1 RFI	2	8	3 - 8
	MPT-2-P2	Phase 1 RFI	2	9	4 - 9
	MPT-2-P3	Phase 1 RFI	2	32	27 - 32
	MPT-2-P4	Phase 1 RFI	2	35	¹ 30 - 35
	MPT-2-P7	Phase 1 RFI	2	10	5 - 10
	MPT-2-P9	Phase 1 RFI	2	35	¹ 30 - 35
	MPT-2-P10	Phase 1 RFI	2	35	¹ 30 - 35
	MPT-2-P11	Phase 1 RFI	2	35	¹ 30 - 35
	MPT-2-P12	Phase 1 RFI	2	30	¹ 25 - 30
	MPT-2-MW17DD	Phase 1 RFI	4	125	115 - 125
	MPT-2-MW17S	Phase 1 RFI	2	13	3 - 13
MPT-2-MW4R	Phase 1 RFI	2	13	3 - 13	
5	MPT-2-2	ESI	2	10	3 - 10
	MPT-2-P6	Phase 1 RFI	2	10	5 - 10
	MPT-2-P8	Phase 1 RFI	2	10	5 - 10
	MPT-2-P13	Phase 1 RFI	2	10	5 - 10
	MPT-2-MW11S	Phase 1 RFI	2	11	2 - 12
	MPT-2-MW12D	Phase 1 RFI	2	24.5	14 - 24
	MPT-2-MW12S	Phase 1 RFI	2	12	2 - 12
	MPT-2-MW15DR	ESI/Phase 1 RFI	2	25	15 - 25
	MPT-2-MW15SR	ESI/Phase 1 RFI	2	15	5 - 15
13	MPT-13-1	ESI	2	10	3 - 10
	MPT-13-2	ESI	2	10	3 - 10
	MPT-13-3	ESI	2	10	3 - 10
	MPT-13-MW4	Phase 1 RFI	2	12	2 - 12
	MPT-13-MW5	Phase 1 RFI	2	13	3 - 13
	MPT-13-MW6	Phase 1 RFI	2	12	2 - 12
	MPT-13-P1	Phase 1 RFI	2	10	5 - 10
	MPT-13-P3	Phase 1 RFI	2	10	5 - 10
	MPT-13-P4	Phase 1 RFI	2	10	5 - 10
	MPT-13-P5	Phase 1 RFI	2	10	5 - 10
	MPT-13-P6	Phase 1 RFI	2	10	5 - 10
22	MPT-22-MW1	Phase 1 RFI	2	12	2 - 12

¹Installed on top of dredge spoils berms.

Notes: SWMU = solid waste management unit.

bis = below land surface.

ESI = Expanded Site Investigation; E.C. Jordan; conducted September 1987 to October 1987.

Phase 1 RFI = Phase 1 Resource Conservation and Recovery Act (RCRA) Facility Investigation; ABB Environmental Services; conducted January 1992 to March 1992.

**Table 1-2
Summary of Chemical Analyses**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Source	Media	U.S. Environmental Protection Agency SW-846 ¹					Totals
		Method 8240 VOC	Method 8270 SVOC	Method 6010, 7470, 7480 Metals	Method 8080 Pest/PCB	General Parameters (soil)	
Background	Sediment ²	4	4	4	4		16
	Groundwater ²	2	2	2	2		10
	Surface water ²	4	4	4	4		20
SWMUs 2, 3, 4, 5, and 22	Soil ²	14	14	14	³ 58	5	100
	Sediment ²	7	7	7	7		28
	Groundwater ²	24	24	24	24		120
	Surface water ²	7	7	7	7		35
SWMU 13	Soil ²	4	4	4	4	3	19
	Sediment ²	4	4	4	4		16
	Groundwater ²	6	6	6	6		30
Total Environmental Samples	Soil ²	18	18	18	62	8	116
	Sediment ²	15	15	15	15		60
	Groundwater ²	32	32	32	32		124
	Surface water ²	11	11	11	11		55
Rig blank	Water	1	1	1	1		4
Sampler blanks	Water	14	14	14	14		56
Field blanks	Water	6	6	6	6		24
Trip blanks	Water	12	0	0	0		12
Total QA/QC Samples	Water	33	21	21	21		96

¹ Selected Appendix IX Groundwater Monitoring List Compounds as analyzed by method indicated.

² Includes field duplicate samples.

³ Includes 44 polychlorinated biphenyls (PCB) soil samples collected from field north of SWMU 2.

Notes: VOC = volatile organic aromatics.
 SVOC = semivolatile organic aromatics.
 Pest/PCB = organochlorine pesticides and polychlorinated biphenyls.
 SWMU = solid waste management unit.
 QA/QC = quality assurance/quality control.

**Table 1-3
Selected Volatile Organic Compounds from Appendix IX Groundwater Monitoring
List (40 CFR 264)**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

CAS Number	Common Name	SW-846 USEPA Method
74-87-3	Chloromethane	8240/8010
74-83-9	Bromomethane	8240/8010
75-01-4	Vinyl chloride	8240/8010
75-00-3	Chloroethane	8240/8010
75-09-2	Methylene chloride	8240/8010
67-64-1	Acetone	8240
75-15-0	Carbon disulfide	8240
75-69-4	Trichlorofluoromethane	8240/8010
75-35-4	1,1-Dichloroethylene	8240/8010
75-34-3	1,1-Dichloroethane	8240/8010
540-59-0	1,2-Dichloroethene (total)	8240
67-66-3	Chloroform	8240/8010
107-06-2	1,2-Dichloroethane	8240/8010
78-93-3	2-Butanone	8240
71-55-6	1,1,1-Trichloroethane	8240/8010
56-23-5	Carbon tetrachloride	8240/8010
108-05-4	Vinyl acetate	8240
75-27-4	Bromodichloromethane	8240/8010
78-87-5	1,2-Dichloropropane	8240/8010
10061-01-5	cis-1,3-Dichloropropene	8240/8010
79-01-6	Trichloroethene	8240/8010
124-48-1	Dibromochloromethane	8240/8010
79-00-5	1,1,2-Trichloroethane	8240/8010
71-43-2	Benzene	8240
10061-02-6	trans-1,3-Dichloropropene	8240/8010
110-75-8	2-Chloroethylvinylether	8240/8010
75-25-2	Bromoform	8240/8010
591-78-6	2-Hexanone	8240

See notes at end of table.

**Table 1-3 (Continued)
Selected Volatile Organic Compounds from Appendix IX Groundwater Monitoring
List (40 CFR 264)**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

CAS Number	Common Name	SW-846 USEPA Method
108-10-1	4-Methyl-2-pentanone	8240
127-18-4	Tetrachloroethene	8240/8010
79-34-5	1,1,2,2-Tetrachloroethane	8240/8010
108-88-3	Toluene	8240
108-90-7	Chlorobenzene	8240/8010
100-41-4	Ethylbenzene	8240
100-42-5	Styrene	8240
1330-20-7	Xylene (total)	8240
541-73-1	1,3-Dichlorobenzene	8240/8010
106-46-7	1,4-Dichlorobenzene	8240/8010
95-50-1	1,2-Dichlorobenzene	8240/8010
107-02-8	Acrolein	8240
74-88-4	Iodomethane	8240
107-13-1	Acrylonitrile	8240
74-95-3	Dibromomethane	8240
97-63-2	Ethyl methacrylate	8240
96-18-4	1,2,3-Trichloropropane	8240
110-57-6	trans-1,4-Dichloro-2-butene	8240
75-05-8	Acetonitrile	8240
107-05-1	3-Chloropropene	8240
107-12-0	Propionitrile	8240
126-98-7	Methacrylonitrile	8240
123-91-1	1,4-Dioxane	8240
80-62-6	Methyl methacrylate	8240
106-93-4	1,2-Dibromoethane	8240
630-20-6	1,1,1,2-Tetrachloroethane	8240
96-12-8	1,2-Dibromo-3-chloropropane	8240
76-01-7	Pentachloroethane	8240
78-83-1	Isobutyl alcohol	8240
126-99-8	Chloroprene	8240

Notes: CAS = chemical abstract service.
USEPA = U.S. Environmental Protection Agency.

**Table 1-4
Selected Semivolatile Organic Compounds from Appendix IX Groundwater
Monitoring List (40 CFR 264)**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

CAS Number	Common Name	SW-846 USEPA Method
62-75-9	N-Nitrosodimethylamine	8270
108-95-2	Phenol	8270
62-53-3	Aniline	8270
111-44-4	bis(2-Chloroethyl)ether	8270
95-57-8	2-Chlorophenol	8270
541-73-1	1,3-Dichlorobenzene	8270
106-46-7	1,4-Dichlorobenzene	8270
100-51-6	Benzyl alcohol	8270
95-50-1	1,2-Dichlorobenzene	8270
95-48-7	2-Methylphenol	8270
39638-32-9	bis(2-Chloroethyl)ether	8270
106-44-5	4-Methylphenol	8270
621-64-7	N-Nitroso-di-n-propylamine	8270
67-72-1	Hexachloroethane	8270
98-95-3	Nitrobenzene	8270
78-59-1	Isophorone	8270
88-75-5	2-Nitrophenol	8270
105-67-9	2,4-Dimethylphenol	8270
65-75-0	Benzoic acid	8270
111-91-1	bis(2-Chloroethoxy)methane	8270
120-83-2	2,4-Dichlorophenol	8270
120-82-1	1,2,4-Trichlorobenzene	8270
91-20-3	Naphthalene	8270
106-47-8	4-Chloroaniline	8270
87-68-3	Hexachlorobutadiene	8270
59-50-7	4-Chloro-3-methylphenol	8270
91-57-6	2-Methylnaphthalene	8270
77-47-4	Hexachlorocyclopentadiene	8270
88-06-2	2,4,6-Trichlorophenol	8270
95-95-4	2,4,5-Trichlorophenol	8270
91-58-7	2-Chloronaphthalene	8270

See notes at end of table.

Table 1-4 (Continued)
Selected Semivolatile Organic Compounds from Appendix IX Groundwater
Monitoring List (40 CFR 264)

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

CAS Number	Common Name	SW-846 USEPA Method
88-74-4	2-Nitroaniline	8270
131-11-3	Dimethyl phthalate	8270
208-96-8	Acenaphthylene	8270
606-20-2	2,6-Dinitrotoluene	8270
99-09-2	3-Nitroaniline	8270
83-32-9	Acenaphthene	8270
51-28-5	2,4-Dinitrophenol	8270
100-02-7	4-Nitrophenol	8270
132-64-9	Dibenzofuran	8270
121-14-2	2,4-Dinitrotoluene	8270
84-66-2	Diethyl phthalate	8270
7005-72-3	4-Chlorophenyl phenyl ether	8270
86-73-7	Fluorene	8270
100-10-6	4-Nitroaniline	8270
534-52-1	4,6-Dinitro-2-methylphenol	8270
86-30-6	N-Nitrosodiphenylamine	8270
122-66-7	1,2-Diphenylhydrazine	8270
101-55-3	4-Bromophenyl phenyl ether	8270
118-74-1	Hexachlorobenzene	8270
87-86-5	Pentachlorophenol	8270
85-01-8	Phenanthrene	8270
120-12-7	Anthracene	8270
84-74-2	Di-n-butyl phthalate	8270
206-44-0	Fluoranthene	8270
129-00-0	Pyrene	8270
85-68-7	Butyl benzyl phthalate	8270
91-94-1	3,3'-Dichlorobenzidine	8270
56-55-3	Benzo[a]anthracene	8270
218-01-9	Chrysene	8270
117-81-7	bis(2-Ethylhexyl) phthalate	8270
117-84-0	Di-n-octyl phthalate	8270

See notes at end of table.

Table 1-4 (Continued)
Selected Semivolatile Organic Compounds from Appendix IX Groundwater
Monitoring List (40 CFR 264)

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

CAS Number	Common Name	SW-846 USEPA Method
205-99-2	Benzo[b]fluoranthene	8270
207-08-9	Benzo[k]fluoranthene	8270
50-32-8	Benzo[a]pyrene	8270
193-39-5	Indeno(1,2,3-cd)pyrene	8270
53-70-3	Dibenz[a,h]anthracene	8270
191-24-2	Benzo[ghi]perylene	8270
109-06-8	2-Picoline	8270
66-27-3	Methyl methanesulfonate	8270
62-50-0	Ethyl methanesulfonate	8270
98-86-2	Acetophenone	8270
100-75-4	N-Nitrosopiperidine	8270
122-09-8	Phenyl-tert-butylamine	8270
87-65-0	2,6-Dichlorophenol	8270
924-16-3	N-Nitrosodi-n-butylamine	8270
55-18-5	N-Nitrosodiethylamine	8270
930-55-2	N-Nitrosopyrrolidine	8270
92-87-5	Benzidine	8270
95-94-3	1,2,4,5-Tetrachlorobenzene	8270
608-93-5	Pentachlorobenzene	8270
134-32-7	1-Naphthylamine	8270
91-59-8	2-Naphthylamine	8270
58-90-2	2,3,4,6-Tetrachlorophenol	8270
122-39-4	Diphenylamine	8270
62-44-2	Phenacetin	8270
92-67-1	4-Aminobiphenyl	8270
82-68-8	Pentachloronitrobenzene	8270
23950-58-5	Pronamide	8270
60-11-7	p-(Dimethylamino)azobenzene	8270
57-97-6	7,12-Dimethylbenz[a]anthracene	8270
56-49-5	Methylcholanthrene	8270
110-86-1	Pyridine	8270

See notes at end of table.

Table 1-4 (Continued)
Selected Semivolatile Organic Compounds from Appendix IX Groundwater
Monitoring List (40 CFR 264)

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

CAS Number	Common Name	SW-846 USEPA Method
10595-95-6	N-Nitrosomethylethylamine	8270
59-89-2	N-Nitrosomorpholine	8270
95-53-4	o-Toluidine	8270
108-39-4	3-Methylphenol	8270
1888-71-7	Hexachloropropene	8270
106-50-3	p-Phenylenediamine	8270
94-59-7	Safrole	8270
120-58-1	Isosafrole	8270
130-15-4	1,4-Naphthoquinone	8270
99-65-0	1,3-Dinitrobenzene	8270
99-55-8	5-Nitro-o-toluidine	8270
99-35-4	1,3,5-Trinitrobenzene	8270
56-57-5	4-Nitroquinoline 1-oxide	8270
91-80-5	Methapyrilene	8270
119-93-7	3,3'-Dimethylbenzidine	8270
53-96-3	2-Acetylaminofluorene	8270
70-30-4	Hexachlorophene	8270

Notes: CAS = chemical abstract service.
 USEPA = U.S. Environmental Protection Agency.

**Table 1-5
Selected Organo-chlorine Pesticides and Polychlorinated Biphenyls
(PCBs) From Appendix IX Groundwater Monitoring List (40 CFR 264)**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

CAS Number	Common Name	SW-846 USEPA Method
319-84-6	alpha-BHC	8080
319-85-7	beta-BHC	8080
319-86-8	delta-BHC	8080
58-89-9	gamma-BHC; lindane	8080
76-44-8	Heptachlor	8080
309-00-2	Aldrin	8080
1024-57-3	Heptachlor epoxide	8080
959-98-8	Endosulfan I	8080
60-57-1	Dieldrin	8080
72-55-9	4,4'-DDE	8080
72-20-8	Endrin	8080
33213-65-9	Endosulfan II	8080
72-54-8	4,4'-DDD	8080
7421-93-4	Endrin aldehyde	8080
1031-07-8	Endosulfan sulfate	8080
50-29-3	4,4'-DDT	8080
72-43-5	Methoxychlor	8080
53494-70-5	Endrin ketone	8080
57-74-09	Chlordane	8080
8001-35-2	Toxaphene	8080
12674-11-2	Aroclor-1016	8080
11104-28-2	Aroclor-1221	8080
11141-16-5	Aroclor-1232	8080
53469-21-9	Aroclor-1242	8080
12672-29-6	Aroclor-1248	8080
11097-69-1	Aroclor-1254	8080
11096-82-5	Aroclor-1260	8080
510-15-6	Chlorobenzilate	8080
2303-16-4	Diallate	8080
465-73-6	Isodrin	8080
143-50-0	Kepone	8080

**Table 1-6
Selected Metals and Inorganic Compounds from Appendix IX
Groundwater Monitoring List (40 CFR 264)**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

CAS Number	Common Name	SW-846 USEPA Method
7440-36-0	Antimony	6010
7440-38-2	Arsenic	6010
7440-39-3	Barium	6010
7440-41-7	Beryllium	6010
7440-43-9	Cadmium	6010
7440-47-3	Chromium	6010
7440-48-4	Cobalt	6010
7440-50-8	Copper	6010
7440-92-1	Lead	6010
7440-97-6	Mercury	7470
7440-02-0	Nickel	6010
7440-49-2	Selenium	6010
7440-22-4	Silver	6010
7440-28-0	Thallium	6010
7440-31-5	Tin	7870
7440-62-2	Vanadium	6010
7440-66-6	Zinc	6010
5955-70-0	Cyanide	9010

Notes: CAS = chemical abstract service.
USEPA = U.S. Environmental Protection Agency.

Naval Energy and Environmental Support Activity (NEESA) Level C Quality Control standards were used for field activities and laboratory analyses. Level C corresponds with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Level III data quality objectives, and is recommended for sites that are located near populated areas, not on the National Priorities List (NPL), and have a low probability of litigation. It is also consistent with standards defined by RCRA for RFIs (USEPA, 1989b).

Data qualifiers defined by USEPA Functional Guidelines (USEPA, 1988; 1990) are used in reporting validated data. Fully usable data are reported without qualifiers and are equivalent to RCRA Level 1 data (USEPA, 1988). Data qualified as estimated values are flagged with a "J," and are equivalent to RCRA Level 2 data. Data that are determined to be unusable for the intended use or are questionable due to significant Quality Assurance/Quality Control (QA/QC) variances are flagged with an "R," and are equivalent to RCRA Level 3 data.

Chapter 2.0 provides general background information for NAVSTA Mayport. Literature and previous investigative data are presented for regional geography, climate, soils, geology, and hydrogeology. Much of this information has been previously presented in the RFI Workplan (U.S. Navy, 1991a).

Chapter 3.0 describes the Group I field activities that occurred during the Phase 1 RFI. In general, these activities were in accordance with the RFI Workplan (U.S. Navy, 1991a). Variances that occurred are discussed in Section 3.3. Chapter 3.0 also provides an assessment of data quality based on field QA/QC and laboratory performances.

Chapter 4.0 presents the findings from field measurements and chemical analyses of media samples collected during the Phase 1 RFI. It presents the investigation-specific findings for geology, hydrogeology, biology, and chemical distribution in soil, surface water, sediments, and groundwater for Group I on a SWMU-by-SWMU basis.

Chapter 5.0 is the crux of the investigative analysis, presenting an assessment of risks to human and ecological receptors on a SWMU-by-SWMU basis, as appropriate. Section 5.1 presents an analysis and assessment of potential human health effects. Section 5.2 presents a similar analysis for ecological receptors.

Chapter 6.0 concludes the report by summarizing the major findings and presenting recommendations for further investigations or corrective measures.

2.0 BACKGROUND INFORMATION

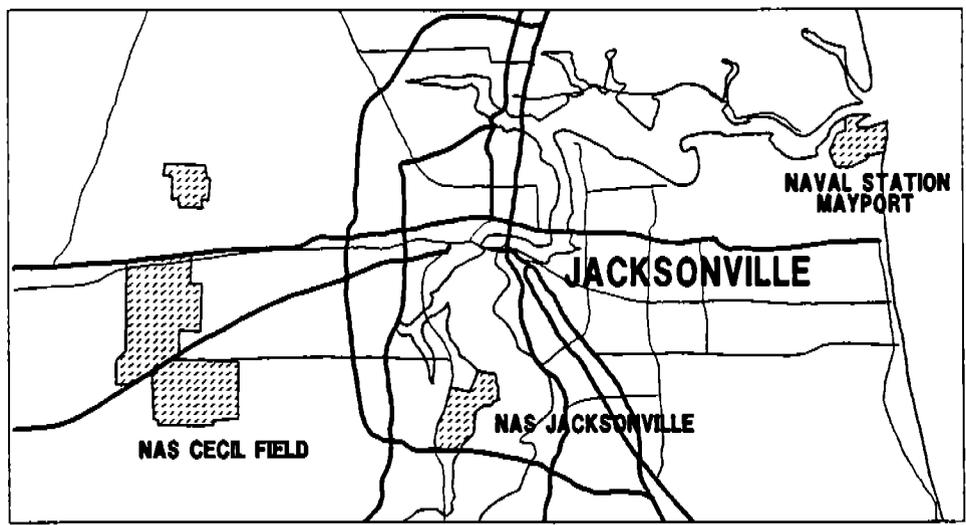
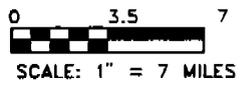
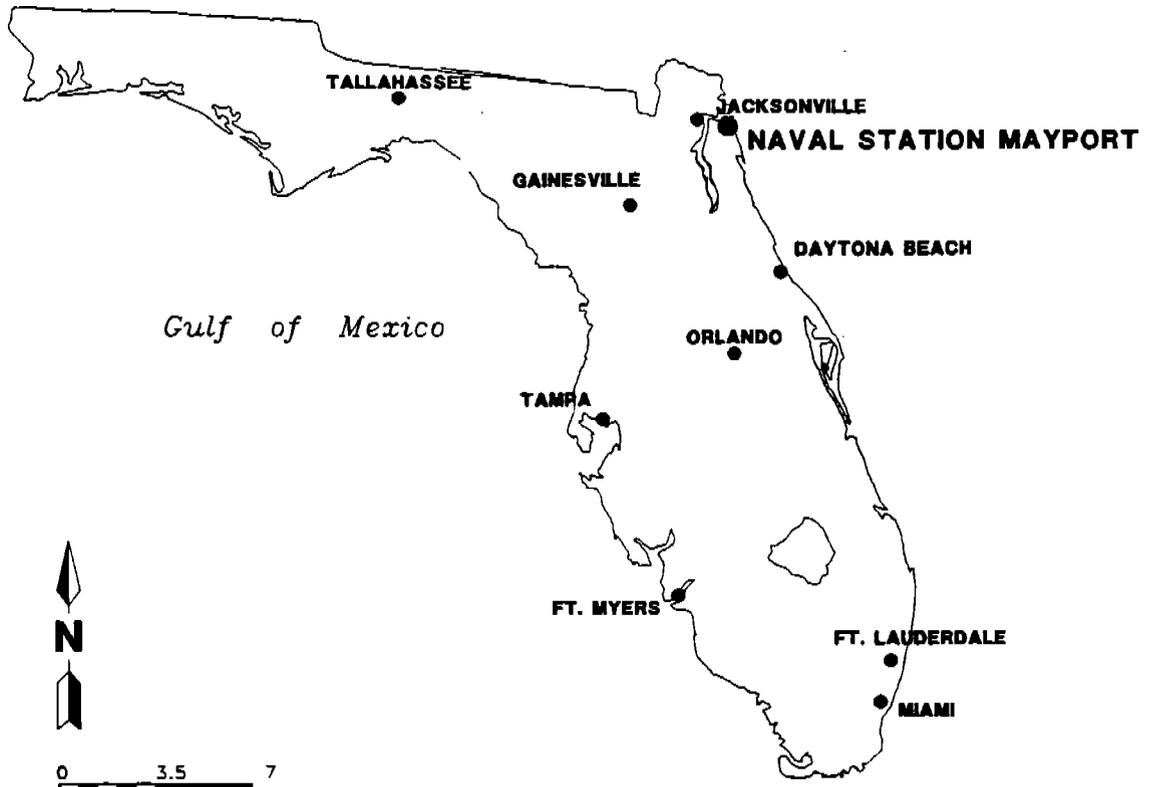
2.1 FACILITY DESCRIPTION. The NAVSTA Mayport is located within the corporate limits of the city of Jacksonville, Duval County, Florida, approximately 12 miles to the northeast of downtown Jacksonville (Figure 2-1). The facility is located on the northern end of a peninsula bounded by the Atlantic Ocean to the east and the St. Johns River to the north and west. NAVSTA Mayport occupies the entire northern part of the peninsula except for the Town of Mayport to the west between the base and the St. Johns River. Mayport Basin is an improved harbor surrounded on three sides by ship piers and located at the northern end of the peninsula.

NAVSTA Mayport supports the surface fleet and naval air operations. The support operations at the base, such as the Public Works Department, provide support for both of these functions. The ship facilities are located in the northern and eastern areas of the complex near the Mayport Basin, and the air facilities are located in the central and western areas near the runway.

NAVSTA Mayport is the fourth largest Navy homeport in the United States, employing approximately 20,000 active duty personnel and 3,000 civilians. Currently, destroyers, frigates, an aircraft carrier, a destroyer tender, and minesweepers are homeported at NAVSTA Mayport. NAVSTA Mayport is home to five helicopter squadrons, with approximately 200,000 take-offs and landings on the 8,000-foot runway per year.

NAVSTA Mayport provides all necessary support services for the ships and aircraft stationed at or visiting NAVSTA Mayport. Services include personnel support, facilities support, and ship and aircraft repair and maintenance. The major industrial operations conducted at the NAVSTA Mayport involve intermediate level maintenance for both ships and aircraft, and vehicle maintenance and repair. For ships, any maintenance activities that can be conducted without putting a ship into drydock are considered intermediate. For aircraft, maintenance conducted is primarily upkeep.

Maintenance and repair operations for ships are carried out by five organizations on the base; two of them are Navy organizations. The Navy organizations are Shore Intermediate Maintenance Activity (SIMA) and Supervisor of Shipbuilding (SUPSHIP). SIMA conducts repair and maintenance operations onboard ships at the piers and in the SIMA operations building. SUPSHIP is a contracting organization that contracts out maintenance and repair work. Three organizations currently under contract with SUPSHIP have facilities at the NAVSTA Mayport. Jacksonville Shipyards, North Florida Shipyards, and Atlantic Marine, Inc., carry out maintenance work onboard ships while they are docked at the piers surrounding Mayport Basin as well as work on removable parts at their facilities. Aircraft maintenance is largely conducted in the hangar buildings by squadron personnel. One Navy organization, Naval Aviation Depot (NADEP), conducts small maintenance operations on aircraft and launching arresting systems in its own building on base. In addition to the ship and aircraft support activities, the base maintains housing and recreational facilities for the active duty personnel and their families.



**FIGURE 2-1
FACILITY LOCATION MAP**



**RCRA FACILITY
INVESTIGATION REPORT
PHASE I**

**U.S. NAVAL STATION
MAYPORT, FLORIDA**

Wastes generated and disposed of at the base include waste oils, fuels, lubricants, solvents, paints, and general refuse associated with ship, aircraft, vehicle, and building maintenance activities. From 1942 to 1979, all wastes were disposed of in landfills on the base. Some of the landfilled wastes were burned at the site to reduce their volume. Waste oils were used for mosquito control around the base. Since 1979, all burnable wastes have been incinerated in a carbonaceous fuel boiler. Incinerator ash, unburnable debris, construction rubble, and large scrap materials were landfilled on the base until early 1985, when all onsite landfills were closed.

2.2 EXISTING SITE CONDITIONS. The following subsections present a summary of existing conditions common to all SWMUs located at NAVSTA Mayport including the Group I sites. It is compiled from readily available information from the technical literature and previous investigations. Group I SWMU-specific information collected during Phase 1 investigations is presented in Chapters 3.0 and 4.0.

2.2.1 Geography and Land Use NAVSTA Mayport lies on the south bank of the St. Johns River at its confluence with the Atlantic Ocean (Figure 2-2), formerly the site of Ribault Bay. Parts of the bay were dredged for construction of the Mayport Basin. Other areas of the bay were filled to accommodate on-shore construction. Most of the station located west of Route A1A and the area south of the dredge spoil areas is comprised of coastal marsh and tidal creeks.

The installation encompasses 3,401 acres, of which approximately half (1,667 acres) is brackish marsh, sand spits, beach (vegetated and nonvegetated), and dredge spoil areas. Other land-use types on NAVSTA Mayport include regularly mowed lawns, roadsides, and a golf course (527 acres); irregularly mowed road and runway shoulders (420 acres); buildings and pavement (387 acres); and managed forest (285 acres). The station also has one 20-acre freshwater lake, Lake Wonderwood.

2.2.2 Physiography and Topography NAVSTA Mayport is situated in the southeastern Coastal Plain physiographic province. The topography of the Coastal Plain in northeastern Florida is controlled by a series of ancient marine terraces, which formed during the Pleistocene when sea level was higher than at present (Leve, 1966). Seven terraces are located in northeast Florida. Moving from west to east and decreasing in elevation, these terraces are the Coharie, Sunderland, Wicomico, Penholoway, Talbot, Pamlico, and Silver Bluff terraces. NAVSTA Mayport lies upon remnants of the Pamlico and the Silver Bluff terraces, which form a low coastal plain throughout most of the central and eastern part of northeast Florida. Elevations of the plain range from slightly above mean sea level (msl) to 25 feet above msl. These original terraces have been modified by sand dune development, stream erosion, and especially by the dredging and filling activities at NAVSTA Mayport.

The land surface exhibits little relief and elevations on station range from about 0 to 30 feet above msl. Many areas at NAVSTA Mayport have been filled with dredge spoil resulting from the construction and maintenance of the turning basin. The elevations of the runway are higher than most of the surrounding land to provide drainage, and they serve as a drainage divide between the southeast and northwest areas of the station.

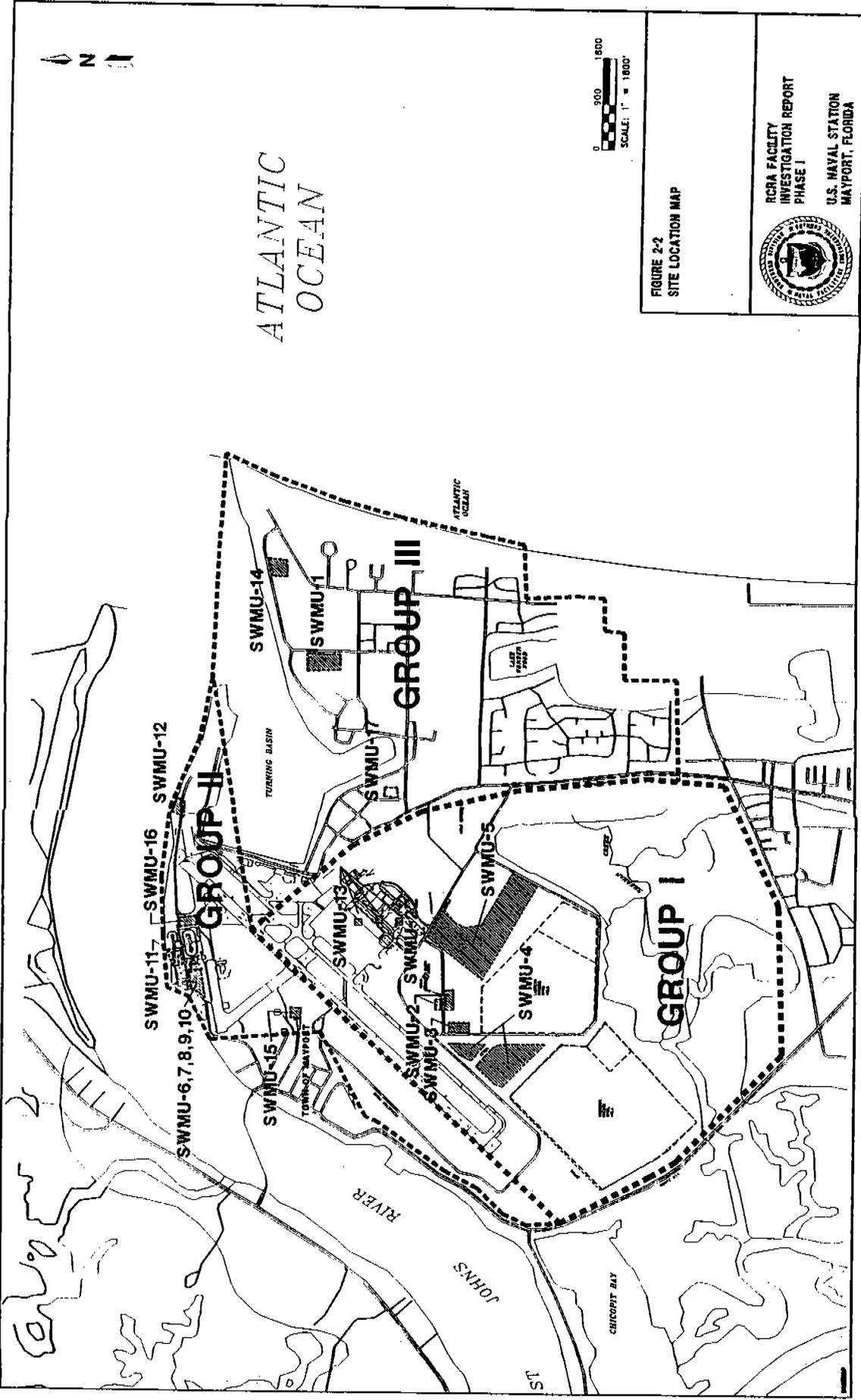


FIGURE 2-2
SITE LOCATION MAP



RCRA FACILITY
INVESTIGATION REPORT
PHASE I
U.S. NAVAL STATION
MAYPORT, FLORIDA

2.2.3 Climate NAVSTA Mayport is located in the northeastern part of Duval County on the Atlantic Coast. Duval County is in the temperate zone, 7 degrees latitude north of the torrid zone, resulting in a climate that tends to be more tropical than temperate. The area is located near the northern boundary of the trade winds, which dominate summer season climate patterns. During winter months, the southerly penetration of the North American Polar Front jet stream dictates the number and intensity of polar air mass penetrations into Florida. Table 2-1 summarizes important weather measurements for the Jacksonville area for the 30-year period between 1941 to 1970 (National Oceanographic and Atmospheric Administration [NOAA], 1979).

The atmosphere is moist with an average relative humidity of about 75 percent, ranging from about 90 percent in the early morning hours to about 55 percent during the afternoon. The average daily sunshine is from 5.5 hours in December to 9.0 hours in May (NOAA, 1983).

Jacksonville's temperatures are more varied than in the more subtropical part of peninsular Florida. The annual mean temperature for Jacksonville is approximately 20 degrees Centigrade (°C). June, July, and August are the hottest months, with temperatures averaging near 27 °C; December, January, and February are the coolest months, with mean temperatures near the 10 °C (NOAA, 1983). Extreme high temperatures are normally associated with low rainfall and drought conditions. Temperatures in excess of 30 °C are not common, but have occurred in every month from May through September. The highest temperature recorded in Jacksonville, 40.5 °C, occurred in July 1942.

Mean annual precipitation for the area is 130.8 centimeters (cm) (NOAA, 1983). From November to February, monthly rainfall normally ranges between 5 and 7 cm; however, monthly accumulations of more than 27.9 cm have occurred during this period. Jacksonville's rainy season is from June to September with monthly rainfall accumulations typically between 15.2 and 20.3 cm. Extreme accumulations of more than 48.3 cm per month have occurred; however, these extremes are generally associated with the passage of tropical storms. Rainfall of 2.5 cm or more in 24 hours normally occurs 14 times a year (NOAA, 1983).

Prevailing winds are northeasterly in the fall and winter months, and southwesterly in spring and summer (NOAA, 1983). The annual mean wind speed is 14.3 kilometers per hour (k/h). Wind speeds of less than 19.3 k/hr can be expected 99 percent of the time. Although Jacksonville lies within the Hurricane Belt, it has been fortunate in escaping hurricane-force winds with the exception of Hurricane Dora in 1964, which produced winds of 132 k/hr (NOAA, 1983).

Snow has fallen in measurable amounts twice since 1871: 14.3 cm in 1899 and 3.8 cm in 1958. Sleet and freezing rainstorms, likewise, have only been recorded twice: once in 1879 and a 16-hour storm in 1962 (NOAA, 1983).

2.2.4 Soils In the vicinity of NAVSTA Mayport, soils consist predominantly of sand, shells, and clay with organic peats in the salt marsh areas. The western area of the station has been built up by dredge spoil material from the St. Johns River and the NAVSTA Mayport Turning Basin. The dredge spoil materials range from sand to silt. According to the U.S. Department of Agriculture, Soil Conservation Service (USSCS) survey (USSCS, 1978) for the City of Jacksonville, Duval County, Florida,

**Table 2-1
Aggregate Weather Measurements for Duval County and Vicinity
(years between 1941 and 1970)**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Measurement	Value	Measurement	Value
Temperature (°C)		Precipitation (millimeters)	
January		Normal	
Daily maximum	18.1	Wettest month	200
Daily minimum	6.9	Driest month	45
July		Annual	1,384
Daily maximum	32.2	Extremes	
Daily minimum	20.2	Wettest month	492
Annual Extremes		Driest month	trace
Length (years)	38	Maximum in 24 hours	258
Record highest	40.6		
Record lowest	-11.1		
Normal heating degree days		Snow (millimeters)	
January	193	Mean total	
Seasonal	737	January	trace
		Seasonal	trace
		Extremes	
		Maximum in 24 hours	38
Wind speed (m/sec)		Sunshine (percent possible)	
Mean speed		January	57
January	3.8	July	61
July	3.3		
Relative humidity (percent)		Annual mean number of days	
January		Sunrise to sunset	
7 a.m. EST	87	Clear	98
1 p.m. EST	57	Partly cloudy	127
7 p.m. EST	74	Cloudy	140
July		Precipitation	
7 a.m. EST	88	0.25 mm or more	116
1 p.m. EST	58	Snow, sleet, or hail	
7 p.m. EST	75	0.25 mm or more	
		Thunderstorms	64
		Heavy fog	37
		Temperature	
		> 32.2 °C	81
		< = 0 °C	14
		< = -17.9 °C	0

Source: National Oceanic and Atmospheric Administration (1979).

Notes: mm = millimeter.
m/sec = meters per second.
°C = degrees centigrade.
EST = Eastern Standard Time.

14 soil types are recognized in the immediate vicinity of NAVSTA Mayport (Figure 2-3). These soils can be placed into three groups:

- soils of the sand ridges,
- soils of the tidal marsh, and
- soils of the flatwoods.

Soils of the sand ridges are sandy to a depth of 80 inches or more and are well drained, occurring on nearly level to moderately steep terrain. At NAVSTA Mayport, these soils cover approximately two-thirds of the station and have been filled or reworked by dredging and earth moving operations. At the station, sand ridge soils are represented by Aquic Quartzipsamments; Arents and sanitary landfill arents; and several soil series comprised of fine-grained sand including beach sand, Mandarin fine sand, Fripp fine sand, and Canaveral fine sand (USSCS, 1978).

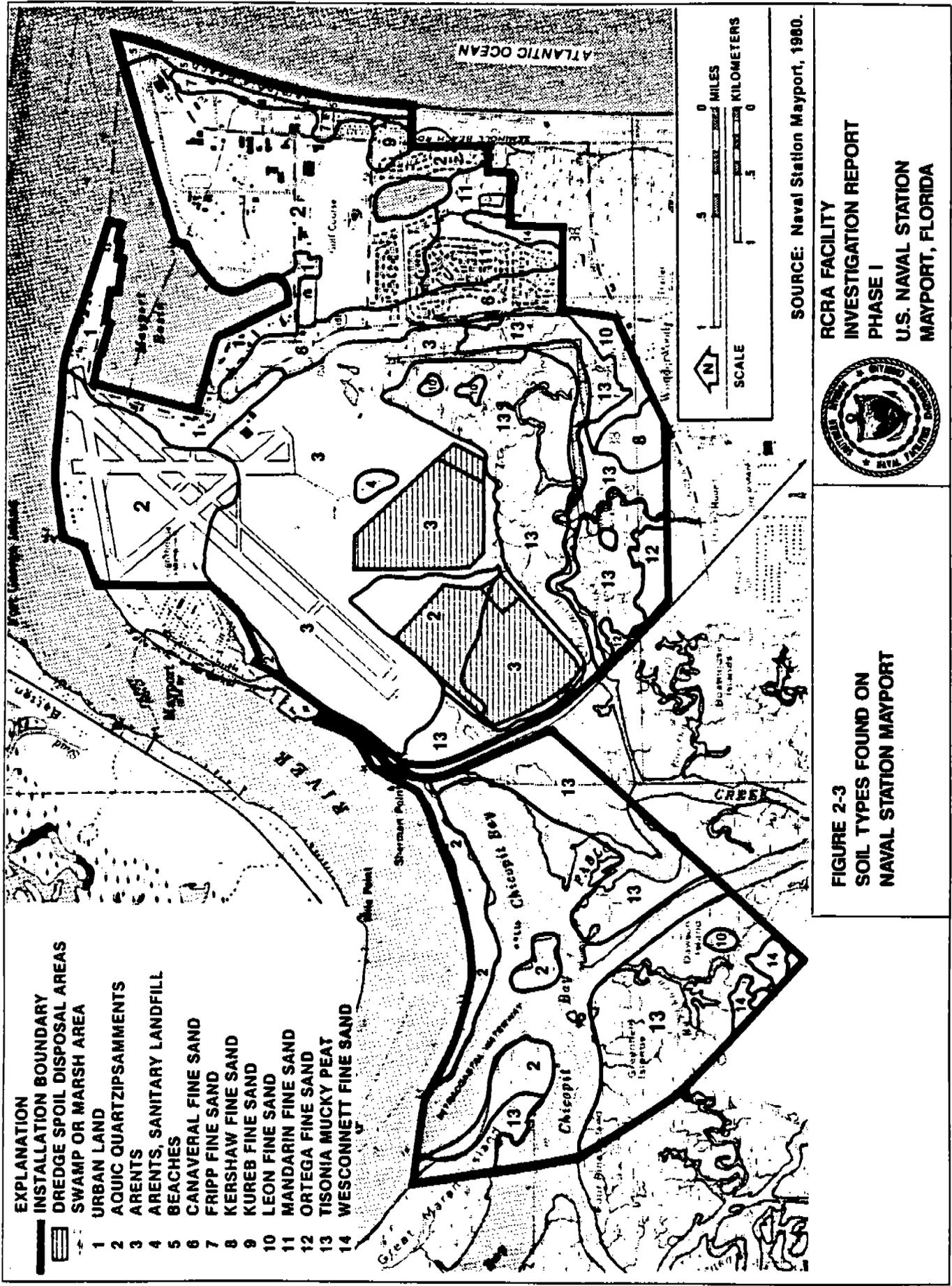
Aquic Quartzipsamments are sandy soils that are variable in composition. Thicknesses of layers range from 2 to 12 feet and under natural conditions these soils have very rapid permeabilities. Arents soils are nearly level, poorly drained soils that have been altered by earth-moving operations. Layers of these soils are typically 2 to 20 feet thick, variable in permeability, and consist of mixed soil material, fine-grained sand, sandy loam, and sandy clay loam (USSCS, 1978). Sanitary landfill Arents soils are similar to Arents but are distinguished by the fact that they overlie sanitary landfill cells.

Beach soils consist of narrow strips of nearly level sand along the Atlantic Ocean. Compositionally they are a mixture of quartz sand, heavy minerals (i.e., rutile and ilmenite), and seashell fragments. The Mandarin fine sand is a nearly level, somewhat poorly drained soil found on narrow to broad ridges slightly higher than the adjacent flatwoods. The soil is composed of fine-grained sand with organic coatings and exhibits moderate to rapid permeabilities (Environmental Science and Engineering [ESE], 1986).

Fripp fine sand is a gently sloping to sloping, excessively drained soil on narrow to broad ridges along the Atlantic Coast. Generally the surface 6 inches is fine-grained sand that changes to fine-grained sand containing horizontal bands of black, heavy minerals below 6 inches. Permeability is rapid throughout the soil. Canaveral fine sand is a nearly level to gently sloping, well to poorly drained soil on a broad ridge near the Atlantic Coast. Permeability is very rapid and the soil consists of fine-grained sand that grades to a mix of fine-grained sand and shell fragments.

Soils of the tidal marsh make up most of the remainder of the soils on NAVSTA Mayport and generally occur in broad expanses of tidal marsh. At NAVSTA Mayport, these soils are represented by the *Tisonia* mucky peat, which is underlain by clay.

Soils are nearly level, poorly drained, and permeability is rapid in the peat and very slow in the clay.



Soils of the flatwoods are sparse at NAVSTA Mayport and are represented by the Wesconnet fine-grained sand found within the tidal marshes. This soil occurs on nearly level to gently sloping terrain, is very poorly drained, and is typically composed of a thin, black, fine-grained sand layer underlain by fine-grained sand. Permeabilities are moderate to rapid.

2.2.5 Regional Geology In northeastern Florida, the distribution of sediments is controlled by the Peninsular Arch and the Southeast Georgia Embayment. NAVSTA Mayport lies at the boundary of this embayment. More than 1,500 feet of Eocene and younger age sediments were deposited in the region underlying the station.

The limestones of Eocene age composed of the Ocala Group are the principal consolidated formations of concern near Mayport (Figure 2-4). The limestone formations of Eocene age in the western part of Duval County, sloping northeastward, and in the eastern part of the county, sloping northwestward, form an irregular trough or basin extending from south-central Duval County northeastward into northeastern Nassau County.

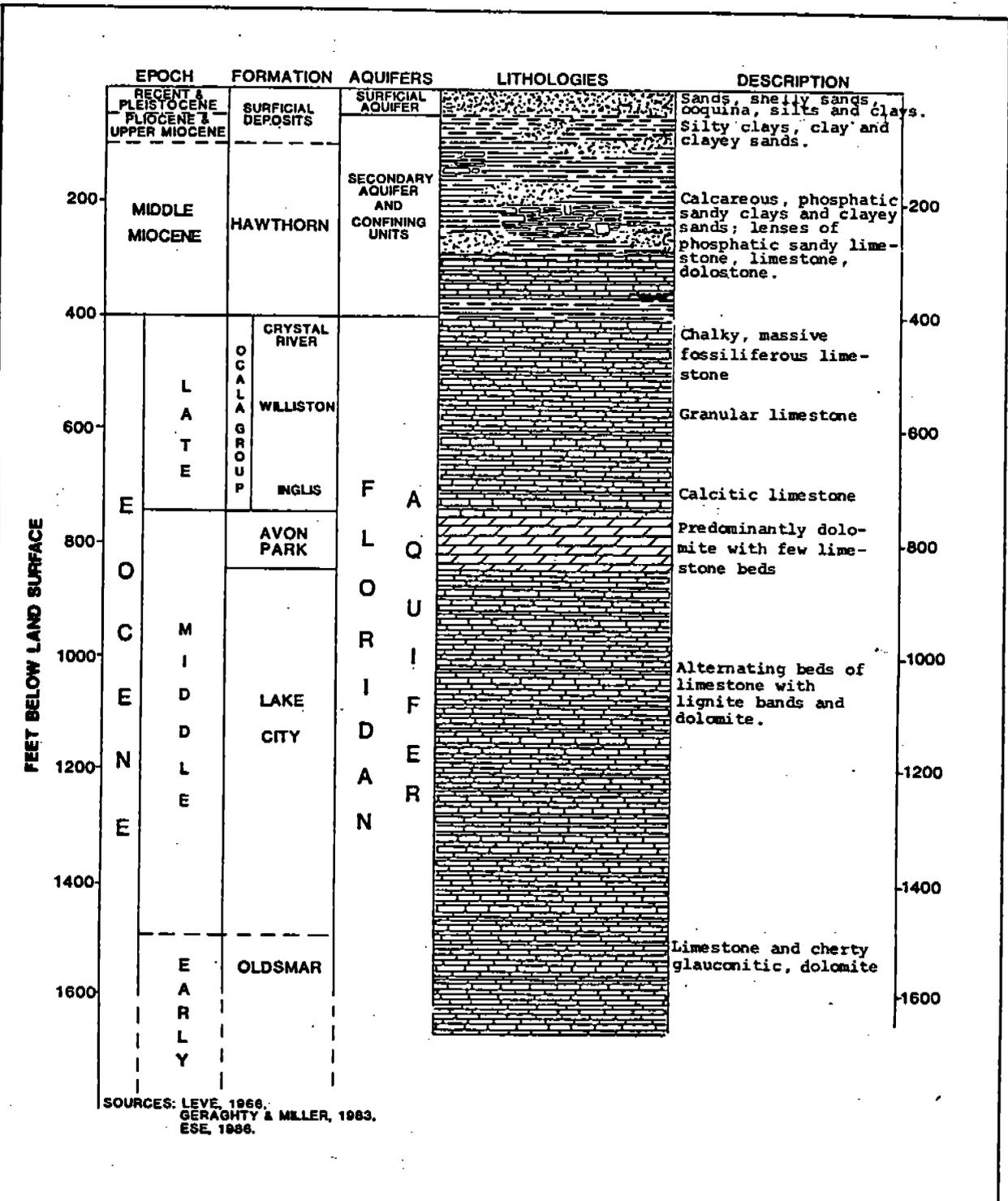
The underlying geologic sequence consists of flat-lying unconsolidated deposits of sands, silts, and clays overlying a thick sequence of marine carbonates. Essentially, there are three discernible geologic units underlying the station as described below (see also Figure 2-4).

- Surficial deposits form a unit approximately 40 to 100 feet thick and are of late Miocene to Recent age.
- The Hawthorn Group is approximately 300 feet thick and of middle Miocene age.
- Marine carbonate sequences of the Floridan aquifer system are of Eocene age and comprise a unit greater than 1,000-feet thick.

These geologic units are described in more detail in the following sections.

2.2.5.1 Surficial Deposits The surficial deposits consist of sediments of upper Miocene age and younger. These deposits can be divided into undifferentiated sediments of Pleistocene and Recent age and sediments of upper Miocene and Pliocene age. These sediments were deposited in lagoon and estuarine environments. The Pleistocene and Recent age sediments extend from the surface to about 40 feet below land surface (bls) and comprise the shallow aquifer. These highly variable sediments include sands, shelly sands, coquina, silts, clay, and shell beds. The upper Miocene and Pliocene sediments consist of silty clays, clay, and clayey sands. The contact between the upper Miocene and Pliocene deposits and the underlying Hawthorn Group is an unconformity marked by a coarse phosphatic sand and gravel bed (Leve, 1966).

2.2.5.2 Hawthorn Group Lithologically the Hawthorn Group is quite variable and consists of calcareous, phosphatic sandy clays and clayey sands interbedded with thin discontinuous lenses of phosphatic sand, phosphatic sandy limestone, limestone, and dolostones. The limestone and dolostone lenses are thicker and more prevalent near the base of the Hawthorn. The permeable sand and limestone layers within the Hawthorn's confining clays form the secondary artesian aquifer. The Hawthorn Group serves as a confining layer that separates the shallow aquifer



SOURCES: LEVE, 1966.
GERAGHTY & MILLER, 1983.
ESE, 1986.

FIGURE 2-4
GENERALIZED GEOLOGIC COLUMN



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from the underlying Floridan aquifer system. It lies unconformably above the Ocala Group (Crystal River Formation).

2.2.5.3 Marine Carbonate Sequences (Floridan Aquifer System) The marine carbonate sequences that make up the Floridan aquifer system beneath NAVSTA Mayport consists of the following formations in descending order:

- the Ocala Group, which consists of the Crystal River Formation, the Williston Formation, and the Inglis Formation;
- the Avon Park Limestone;
- the Lake City Limestone; and
- the Oldsmar Limestone.

These formations range in age from the late Eocene Crystal River Formation to the early Eocene Oldsmar Limestone.

The Crystal River Formation is a white to cream, chalky, massive fossiliferous limestone and is the youngest Eocene formation underlying NAVSTA Mayport. The Williston Formation, which lies conformably between the overlying Crystal River Formation and the underlying Inglis Formation, is a tan to buff granular limestone. The Inglis Formation, of early late Eocene age, is lithologically a tan to buff calcitic limestone that is very similar to the Williston Formation (Leve, 1966).

The Avon Park Limestone, of late middle Eocene age, unconformably underlies the Ocala Group. It consists of alternating beds of tan, hard, massive dolomite and brown to cream, granular, calcitic limestone. The Lake City Limestone unconformably underlies the Avon Park Limestone and is early middle Eocene in age. Lithologically, it consists of alternating beds of white to brown, chalky to granular limestone with lignite bands and gray to tan dolomite. Below the Lake City Limestone is the Oldsmar Limestone of early Eocene age. It consists of a cream to brown, soft, granular limestone and cherty, glauconitic, massive to finely crystalline dolomite (Leve, 1966).

2.2.6 Regional Hydrology

2.2.6.1 Surface Water NAVSTA Mayport is situated at the mouth of the St. Johns River on the south bank (see Figure 2-2). Average discharge of the St. Johns River is estimated to be between 6,000 and 8,300 cubic feet per second (cfs) or about 3,900 million gallons per day (mgd) (Heath and Conover, 1981; U.S. Geological Survey [USGS], 1967). The facility is bordered on the east by the Atlantic Ocean and to the north and northwest by the St. Johns River. To the south and southwest, an extensive tract of tidal marsh exists within the boundaries of the facility.

The facility has one manmade, freshwater lake, Lake Wonderwood, located in the onbase housing area. Lake Wonderwood occupies approximately 20 acres and was created to provide fill for the adjacent housing area. The lake has a depth of approximately 20 feet and is used by facility personnel for recreation.

The other dominant surface water feature on base is the turning basin, i.e., Mayport Basin. The turning basin was constructed during the early 1940's by dredging the eastern part of Ribault Bay. Dredge spoil was pumped behind the west bulkhead to fill the old bay in order to elevate the land surface. Subsequent maintenance dredge spoil has been used to fill in other areas of the facility. Originally Mayport Basin was dredged to a depth of 29 feet. In 1952 the basin was deepened to a depth of 40 feet to provide access to larger ships.

Surface runoff from NAVSTA Mayport enters Mayport Basin, the St. Johns River, Lake Wonderwood, Sherman Creek, Pablo Creek, Chicopit Bay, and the Atlantic Ocean. The runways provide an artificial drainage divide between the northwest and southeast parts of the facility. To the north, soils along the St. Johns River tend to be very sandy and have high infiltration capacities. In this area there exists little surface runoff and few drainage features are evident.

To the south of the runways, soils are underlain by less permeable deposits and the topography is flatter and lower in elevation. The predominate drainage feature in this area is Sherman Creek.

The St. Johns River is the major freshwater surface feature near Mayport. The lower St. Johns River flows along a floodplain that in places exceeds 10 miles in width. The lower part of the river averages about 1 mile in width. The river is strongly affected by tides. Storage capacity of the main channel is high because of the size of the stream, the low gradient, the wide floodplain, and upstream lakes. The range in stage, which averages 8.3 feet, represents considerable volumes of water temporarily held in storage over the broad, flat floodplain, prior to discharge into the Atlantic Ocean.

Strong tidal action in the lower reaches of the river makes the determination of flow characteristics difficult. Average flow, as estimated by the USGS (1967), is 8,300 cfs based on average unit runoff values determined in upstream and downstream flow measurements with maximums to 130,000 cfs (Florida Department of Natural Resources [FDNR], 1967).

The St. Johns River area south of Jacksonville has good water quality, as do many of the upper parts of the tributaries to the St. Johns. However, tributaries in the residential and commercial parts of Jacksonville have fair to poor water quality and the St. Johns River, which drains these polluted areas, has degraded to fair water quality. Cedar River, Wills Branch, Butcher Pen Creek, and Strawberry Creek are the Jacksonville area creeks with the worst overall quality. Studies by the Northeast District Office of the Florida Department of Environmental Regulation (FDER) have indicated that Goodby's Creek also has very poor water quality. Pablo Creek is part of the Intracoastal Waterway (ICWW) near NAVSTA Mayport and water quality is generally good along its reach up to the confluence with the St. Johns River. The specific water quality problems in these areas include elevated nutrient and bacterial concentrations and low levels of dissolved oxygen due to the urban character of the watershed. Elevated levels of bacteria are more uniformly distributed throughout Duval County. No general overall trends are evident for nutrients and dissolved oxygen; however, bacteria concentrations show a marked improvement from 1973 through 1978 due to improved sewage treatment (FDER, 1986).

Data for seven Storage and Retrieval of Water-Related Data (STORET) water quality sites from 1975 to 1979 (monitoring at these sites has ceased; therefore, more recent data are not available) indicate that metals exceeded the State water quality criteria 141 times for cadmium (approximately 73 percent of times sampled), 110 times for copper (53 percent), 11 times for chromium (37 percent), once for mercury (10 percent), and 22 times for lead (10 percent) (FDER, 1986).

The North Florida Atlantic coastline is also subject to hurricane hazards with an average return frequency of approximately 5 years between major storm events. Major flooding can occur in low lying coastal areas during a hurricane as a result of storm surges caused by low-pressure-induced high tides and "water-piling" caused by high winds, shallow shores, and the landfall aspect of the storm.

According to the National Flood Insurance Program (Federal Emergency Management Agency [FEMA], 1989), the immediate shoreline area of NAVSTA Mayport is subject to potential coastal flooding with velocity hazards (wave action). No base flood elevations were determined for these areas. The southern areas in close proximity to Sherman Creek have base flood elevations of 7 to 8 feet and are within the 100-year floodplain. The majority of NAVSTA Mayport, which includes all SWMUs, are outside the 500-year floodplain.

2.2.6.2 Surficial Aquifer The surficial aquifer extends to a depth of approximately 70 feet bls (Causey and Phelps, 1978; Franks, 1980). It is comprised of unconsolidated deposits of sand, shells, and clay, which vary in lithology, thickness, and permeability throughout the facility. Causey and Phelps (1978) report that the surficial aquifer under most of Duval County is composed of an upper and a lower zone that are separated by deposits of lower permeability at a depth from 25 to 50 feet bls. Franks (1980), however, found no evidence of this confining bed in the eastern part of NAVSTA Mayport.

Throughout much of NAVSTA Mayport, surficial groundwater flow is generally radial towards the major surface water features. These water bodies include the Atlantic Ocean to the east, the St. Johns River to the north and west, and Sherman Creek to the south. Detailed discussions addressing facility, Group I, and SWMU-specific hydrogeology are presented in Chapter 4.0.

Geraghty & Miller (1984), citing the work of Causey and Phelps (1978), report that groundwater in the surficial aquifer at NAVSTA Mayport is fresh in the upper part but becomes brackish below a depth of 40 feet. This was also confirmed by Frazee and McClaugherty (1979) in other areas near NAVSTA Mayport. General groundwater quality data collected during the Phase 1 investigations confirm the trend of increasing total dissolved solids with depth. Detailed discussions are presented in Chapter 4.0.

2.2.6.3 Secondary Artesian Aquifer The secondary artesian aquifer consists of sand and limestone lenses interbedded in the clayey sands and sandy clays of the Hawthorn Group and is situated between the surficial aquifer and the underlying Floridan aquifer system. Spechler (1982) noted that the most productive zone, a limestone layer in the upper part of the Hawthorn, is notably absent in the Mayport area. Water levels in the secondary artesian aquifer indicate that groundwater flow in the Mayport area is towards the northeast (Fairchild, 1972).

2.2.6.4 **Floridan Aquifer System** The Floridan aquifer system is the principal source of freshwater in northeast Florida. It is comprised in part or all by the Oldsmar, Lake City, and Avon Park Limestones; the Ocala Group; and a few discontinuous thin water bearing zones in the lower part of the Hawthorn Group. Figure 2-4 presents a generalized geologic column for the northwest Florida region.

The Ocala Group is a homogeneous sequence of permeable, hydraulically connected, marine limestone beds that contain few hard dolomite or limestone beds to restrict the vertical movement of water. The Avon Park Limestone consists almost entirely of hard, relatively impermeable, dolomite beds that restrict the vertical movement of water between the overlying and underlying permeable zones. The Lake City and Oldsmar Limestone each contain alternating hard, relatively impermeable dolomite confining beds and soft, permeable limestone and dolomite water-bearing zones.

The top of the Floridan aquifer occurs at a depth of about 400 feet bls at NAVSTA Mayport. Published transmissivities of the Floridan aquifer in eastern Duval County range from approximately 85,000 to 160,000 gallons per day per foot (g/d/ft) (Leve, 1966).

Geraghty & Miller (1983) report that groundwater in the Floridan aquifer in the vicinity of Mayport is moving southward toward areas of heavy pumpage along the coast. Floridan aquifer wells in the vicinity of NAVSTA Mayport are under sufficient artesian pressure to flow at the surface. Water quality in the Floridan aquifer system is potable in the Mayport area. The concentration of total dissolved solids is approximately 400 milligrams per liter (mg/l) and the concentration of chlorides is around 25 mg/l.

The potentiometric surface of the Floridan aquifer exists at elevations above land surface, resulting in a net upward hydraulic gradient between the Floridan and surficial aquifers (Geraghty & Miller, 1983). This information indicates that the secondary artesian aquifer located in the Hawthorn Group receives recharge from the Floridan aquifer.

According to Fairchild (1972), the potentiometric surface of the secondary artesian aquifer roughly follows the configuration of the land surface. This indicates that no hydraulic gradient can be observed between the surficial aquifer and the secondary artesian aquifer. Recharge to the secondary artesian aquifer comes primarily from upward leakage from the Floridan aquifer.

2.3 PREVIOUS INVESTIGATIONS. Two investigations of SWMUs at NAVSTA Mayport have been conducted under the Navy's Installation Restoration (IR) program and its predecessor, the Navy Assessment and Control of Installation Pollutants (NACIP) program. An Initial Assessment Study (IAS) was conducted in late 1985 by ESE (1986), and an Expanded Site Investigation (ESI) was conducted in late 1987 by E.C. Jordan Company (1988).

The purpose of the IAS was to identify and assess sites posing a potential threat to human health or the environment due to contamination from past hazardous waste operations. The IAS included a records search both at the base and at other government agencies followed by an onsite survey and interviews with facility personnel. Each site identified during this process was then evaluated for

contamination characteristics, migration pathways, and potential receptors. Recommendations were made regarding the need for additional investigations. The IAS identified 17 potentially contaminated sites at NAVSTA Mayport, and recommended 8 for further study.

The purpose of the ESI was to determine whether specific toxic and hazardous materials are present at suspected waste disposal sites and to recommend further action if required. Ten sites identified in the IAS were investigated during the ESI. The investigations included a terrain conductivity survey; 30 soil borings; installation of 28 monitoring wells; and collection and analysis of 4 surface water and sediment samples, 30 groundwater samples, and 27 soil samples. Based on evaluation of the data, the ESI recommended remedial action at one site based on high levels of polychlorinated biphenyls (PCB) in the soil. Additional investigations were recommended for two sites to further clarify the site conditions and verify the presence of contamination. Risk assessments were recommended at seven sites based on elevated levels of pesticides or metals found in groundwater or surface water samples.

Sampling procedures and rationale used for previous sampling strategies were presented in the final ESI report (E.C. Jordan, 1988). The samples collected during the ESI were analyzed for priority pollutant base-neutral extractable compounds, priority pollutant acid extractable compounds, priority pollutant pesticides and PCBs, USEPA Method 624 volatile organic compounds, and extraction procedure toxicity (EPTOX) metals, cadmium, chromium, lead, and mercury because limited quantitative data existed to characterize suspected contaminants at the Navy IR program sites.

Although the Navy IR program ESI was a thorough investigation within its goal and objectives, insufficient information exists to adequately assess the quality of the data. The data was therefore used only to assist in defining the scope of the RFI Workplan (U.S. Navy, 1991a). Because the ESI data is of unknown quality it has only been used qualitatively for site characterization and risk assessment.

An RCRA Facility Assessment (RFA) for NAVSTA was conducted in 1989 on behalf of the USEPA Region IV by their contractor, A.T. Kearney, Inc. The RFA identified 56 SWMUs and 2 Areas of Concern (AOC) at the NAVSTA Mayport facility. Fifteen of these SWMUs were determined not to require further action. Twenty-three of the remaining SWMUs were determined to require further investigation. The remaining 18 SWMUs were determined to require an RFI. The two AOC consist of petroleum underground storage tanks and appurtenances and are being managed under a different program of RCRA (e.g., 40 Code of Federal Regulation [CFR] 280, per RCRA, Subtitle C, Regulation of Underground Storage Tanks).

Of the 18 SWMUs, 17 had been previously identified in an HSWA permit (H016-118598) issued by the USEPA on March 25, 1988. This permit required that an RFI be conducted at these 17 SWMUs. The Navy prepared a Draft Final RFI Workplan (U.S. Navy, 1989) in response to the HSWA permit requirements addressing these 17 SWMUs. The Draft Final RFI Workplan was reviewed by applicable regulatory agencies and their comments were sent to the Navy on May 6, 1991. The additional SWMU determined by the USEPA during the RFA to require an RFI was the Building 1600 Blasting Area. The USEPA reported in their May 6, 1991, comments to the existing Draft Final RFI Workplan that they would address the 39 additional

SWMUs, identified during the RFA under revised permit conditions, at a later date.

The revised RFI Workplan addressed the original 17 SWMUs identified in the HSWA Permit of March 28, 1988. In addition, RFA SWMU 22 (Building 1600 Blasting Area) was included in the RFI. The management strategy for addressing remaining SWMUs was described in the Corrective Action Management Plan (CAMP), Appendix F, Volume I (U.S. Navy, 1991a).

The CAMP prioritized the SWMUs into four groups based on existing site knowledge and a preliminary assessment of the potential relative risks posed by each group. The Phase 1 RFI activities described in this report address the Group I SWMUs identified in the HSWA permit and SWMU 22 (Figure 2-5). These SWMUs include:

- SWMU 2, Landfill B;
- SWMU 3, Landfill D;
- SWMU 4, Landfill E;
- SWMU 5, Landfill F;
- SWMU 13, Old Fire Training Area; and
- SWMU 22, Building 1600 Blasting Area.

Table 2-2 lists all Group I SWMUs identified in the HSWA permit and identifies whether they were included in the IAS and the ESI.

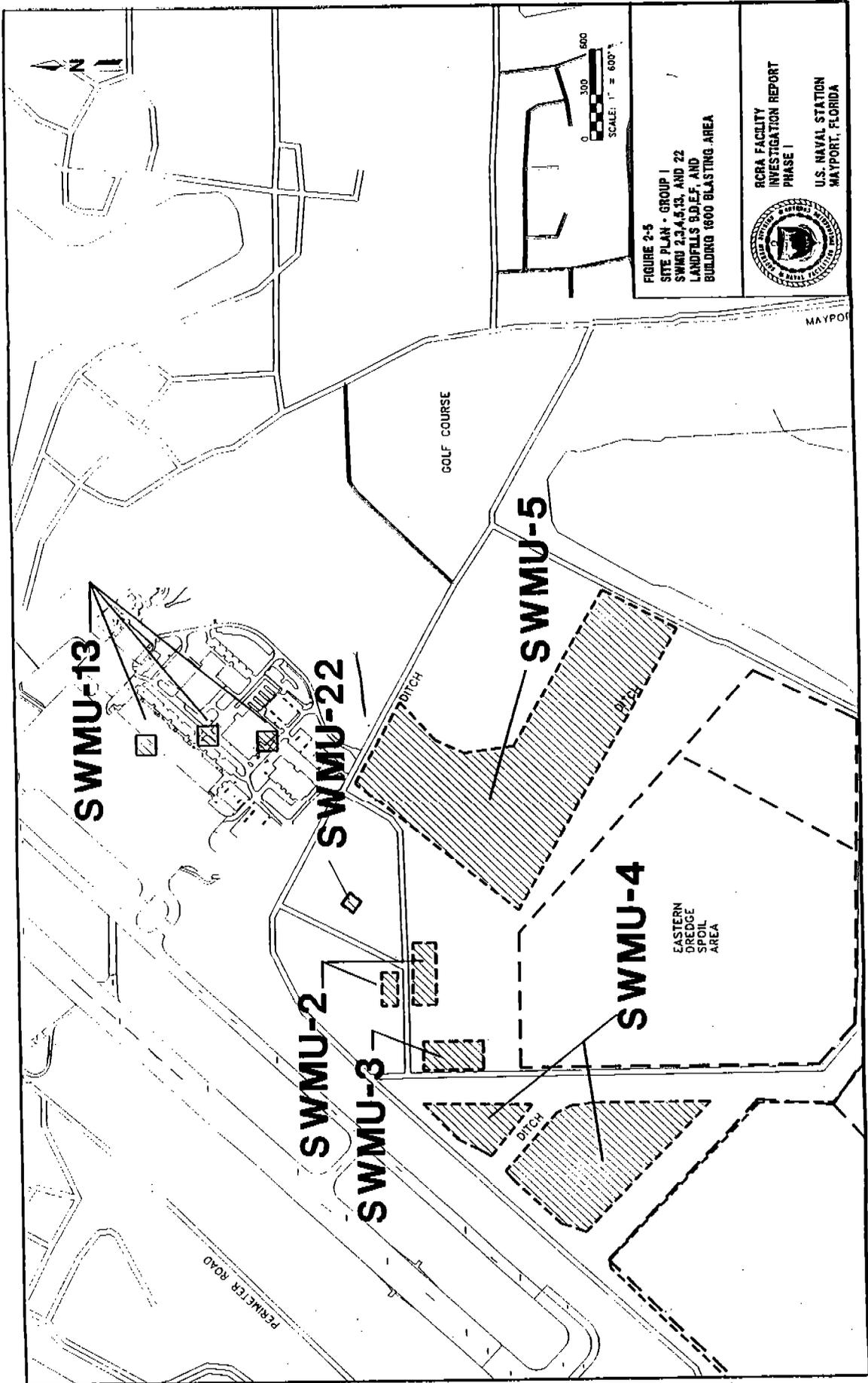


FIGURE 2-5
 SITE PLAN - GROUP I
 SWMU 2, 3, 4, 5, 13, AND 22
 LANDFILLS B.D.E.F. AND
 BUILDING 1800 BLASTING AREA



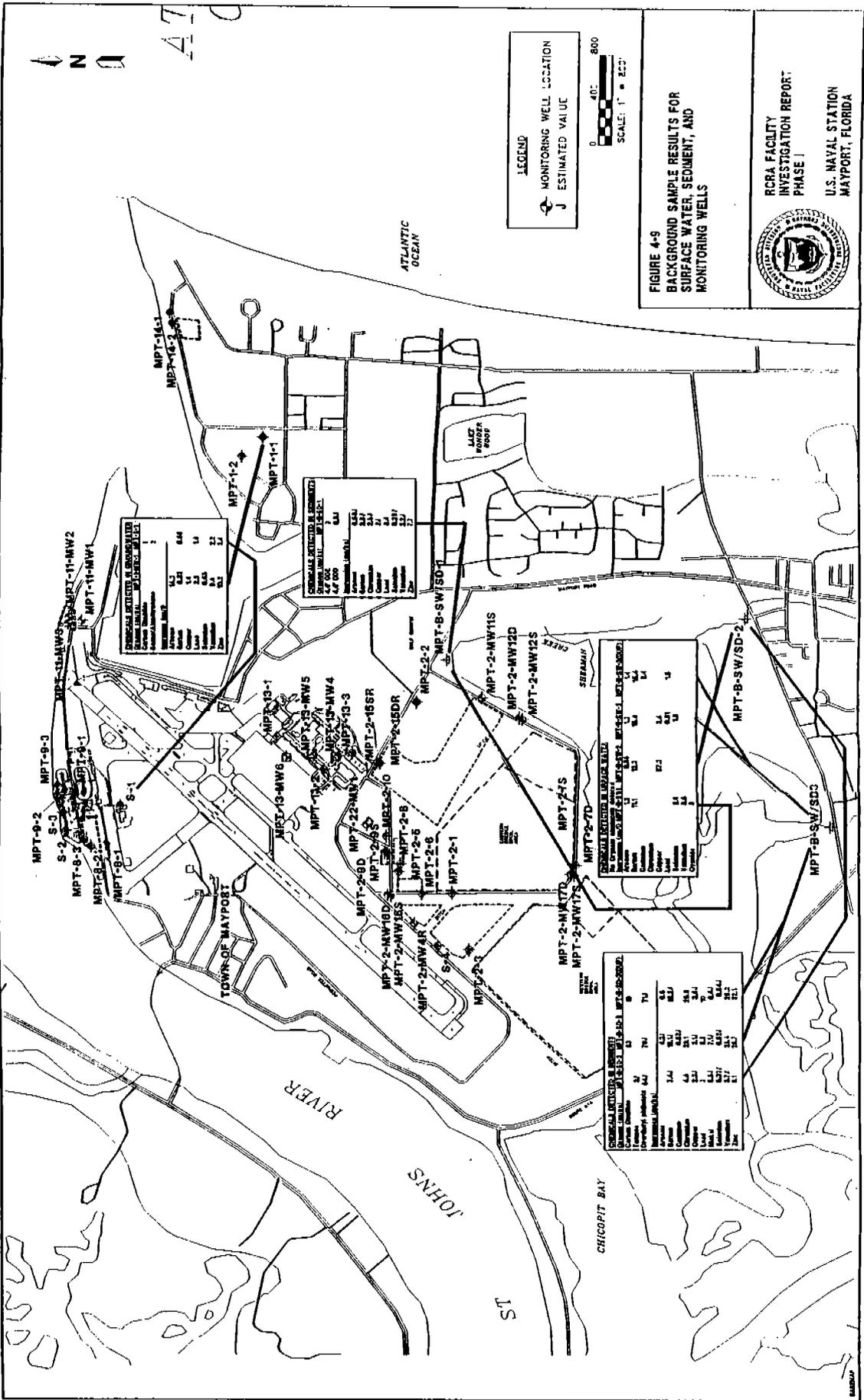
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**Table 2-2
Group I Solid Waste Management Units (SWMUs)**

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RFA SWMU No.	HSWA SWMU No.	NIRP Site No.	Site Name	IAS	ESI	RFI Required
2	B	2	Landfill B	Yes	Yes	Yes
3	C	4	Landfill D	Yes	Yes	Yes
4	D	5	Landfill E	Yes	Yes	Yes
5	E	6	Landfill F	Yes	Yes	Yes
13	M	13	Old Fire Training Area	Yes	Yes	Yes
22	NA	NA	Building 1600 Blasting Area	No	No	Yes

Notes: RFA = Resource Conservation and Recovery Act (RCRA) Facility Assessment, A.T. Kearney, 1989 (draft).
 SWMU = Solid Waste Management Unit.
 HSWA = Hazardous and Solid Waste Amendments Permit No. H016-118598.
 NIRP = Naval Installation Restoration Program.
 IAS = Initial Assessment Study, Environmental Science and Engineering, 1986.
 ESI = Expanded Site Investigation, E.C. Jordan Company, 1988.
 RFI = RCRA Facility Investigation.



3.0 PHASE 1 RCRA FACILITY INVESTIGATION (RFI) ACTIVITIES

This section provides a summary of the field activities conducted during the Phase 1 RFI. As discussed in Chapter 1.0, the Phase 1 RFI at NAVSTA Mayport is designed to: (1) determine the nature and extent of releases from Group I area SWMUs; (2) characterize the potential pathways of contaminant migration in the soil, surface water, and groundwater; (3) identify potential receptors; and (4) assess potential risks to human health and the environment. The need for a Corrective Measures Study will be determined based on the findings and conclusions of the investigation.

Activities undertaken during the Phase 1 RFI were divided into facility-wide activities and SWMU-specific activities. Facility-wide activities included background characterization and identification of potential receptors and are applicable to all phases of the RFI. Background characterization consisted of collecting background water and sediment samples and installation of piezometers in areas other than the Group I SWMU area. SWMU-specific investigations include monitoring well and piezometer installation, well measuring point and potentiometric surface survey, aquifer hydraulic properties testing, a tidal influence study, and collection and analysis of soil, sediment, surface water, and groundwater samples.

Site investigations were planned using existing data (e.g., ESI) as the basis for explorations. Adjustments in the field to procedures described in the RFI Workplan were documented with change orders made during the RFI as additional data became available or when procedures were modified to meet site-specific field conditions. These modifications were in compliance with standard procedures described in the RFI Workplan and the Quality Assurance Project Plan (U.S. Navy, 1991b).

3.1 DATA COMPILATION. This subsection describes the data collection, management, and assessment process used during the Phase 1 Mayport RFI. The goal of the data gathering process is to obtain site characterization data of known quality. These data are used to identify possible hazards and corrective measures at the Group I SWMUs, as well as supplement future environmental investigations at NAVSTA Mayport. Specific actions and findings are discussed in subsequent sections. The seven basic elements of the data compilation process are:

- background data search,
- field activities,
- laboratory analyses,
- data validation,
- data reduction and organization,
- data analysis and conclusion, and
- report and data presentation.

Background data were collected prior to field activities during the investigation planning phase. Much of this initial information was used to define the scope of the work described in the RFI Workplan (U.S. Navy, 1991b). Background information was obtained from previous investigative data, technical literature, and regional sources in Federal, State, and local regulatory agencies (for

example, FEMA, FDER, and Duval County agricultural extension service). Additional background data were collected during field activities such as facility utility drawings in AutoCAD™ format, USGS digital maps, and other facility-specific information. Risk assessment and environmental regulatory standards were reviewed to assure that current information was used at the time of analysis.

Field activities focused on sample collection, measurements, and observations. QA/QC field controls described in the Workplan were implemented to minimize sampling and measurement errors. Samples were collected and transported under chain of custody to the laboratory each day of collection. Field, rinsate, and trip blanks were collected and sent to the laboratory for analysis. Field data were recorded in standardized forms and logbooks. Electronic data-loggers were also used during tidal measurements. Field activity records were maintained in an onsite file.

Soil, sediment, and water samples were sent to an USEPA certified laboratory for analysis of selected Appendix IX analytes. Wet chemistry analyses were specified for selected surface and groundwater samples. Bore-hole soil samples were also analyzed for physical parameters such as particle size distribution, cation exchange capacity, total organic content, and others.

Modified USEPA Contract Laboratory Program (CLP) Form A data packages obtained from the laboratory were sent to independent data validators for assessment of laboratory data quality in accordance with Naval Energy and Environmental Support Activity (NEESA) Level C. Data validators manually edited the Form I's for each sample delivery group and provided a narrative describing data validation findings.

Field data such as borehole and well construction logs were reviewed and edited. Proprietary software packages (GTGS™ and AQTESOLV™) were used to analyze slug test data and to construct final borehole and well construction logs. Laboratory data were up-loaded into an electronic relational database (Paradox™) for future retrieval and manipulation. Base maps were constructed (AutoCAD™) using USGS digital maps enhanced with site-specific utility and topographic survey data. Physical files were established and maintained for storage and retrieval of project documents.

Data were analyzed to verify regional and site-specific geologic, hydrogeologic, and ecological conditions. Validated chemical data were reviewed to confirm data usability. Validated chemical data were assessed to characterize SWMUs for extent of contamination. Chemicals of concern were identified, and risks associated with expected exposure scenarios were estimated for human and ecological receptors. Recommendations for future actions were formulated.

Data were compiled in a report format incorporating narratives, summary tables, figures, and appendices of supporting information. A multi-disciplinary peer review process provided independent criticism of the data assessment, findings, conclusions, and recommendations. Corrective measures were implemented and revisions made prior to production of the final document.

3.2 SUMMARY OF EXPLORATION AND SAMPLING PROGRAM. To characterize the extent of contamination within the Group I area and to identify potential receptors, the investigation included both facility-wide and SWMU-specific explorations. The facility-wide activities focused on defining background levels of contaminants found at NAVSTA Mayport, identifying potential receptors, and assessing risks. These activities are discussed further in Chapter 5.0. The exploration and sampling program included seven subtasks:

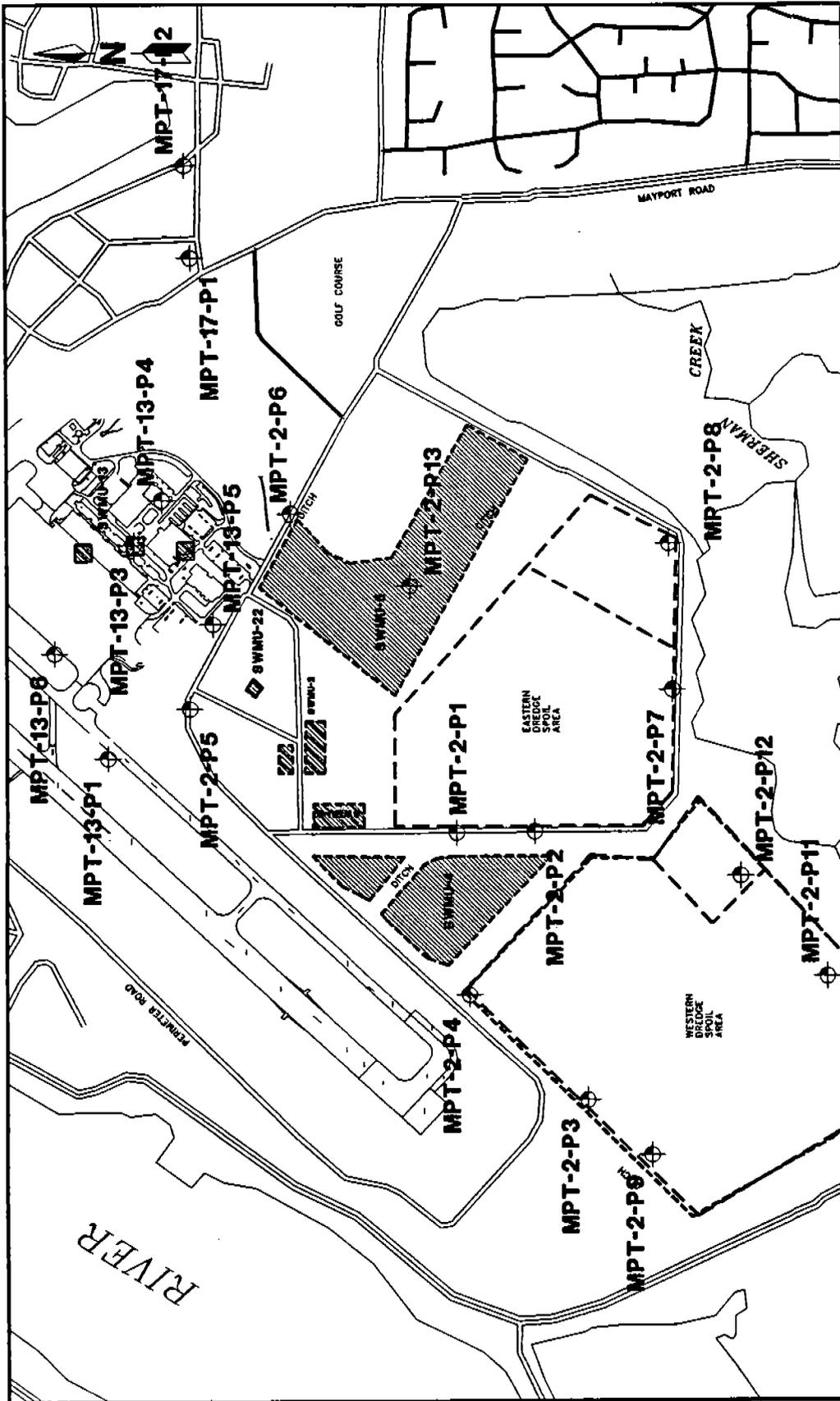
- piezometer and monitoring well installation,
- soil sampling,
- surface water and sediment sampling,
- groundwater sampling,
- background characterization,
- hydrological investigations, and
- biological investigations.

3.2.1 Piezometer and Monitoring Well Installation Prior to Phase 1 field activities, 15 wells had been installed in the Group I area by others. During Phase 1, 11 additional monitoring wells and 18 piezometers were installed within the Group I area at NAVSTA Mayport. These wells were distributed among three paired-well clusters and five individual monitoring wells. Three monitoring wells installed during previous investigations were replaced due to damage. These wells consisted of one two-well cluster and an individual well. In addition, 10 piezometers were installed in Group II and III areas to: (1) augment the potentiometric surface mapping, (2) increase the effectiveness of the tidal influence study, and (3) analyze hydrogeology during subsequent RFI phases. In total, 15 monitoring wells and 28 piezometers were installed during Phase 1 field activities.

The wells and piezometers were installed to assess groundwater quality at each SWMU and to characterize groundwater flow direction and hydraulic gradient. Boring logs and well construction diagrams for all existing and newly installed wells are presented in Appendix A. Monitoring well and piezometer locations are shown in Figures 3-1 and 3-2, respectively. New wells installed during this phase of the RFI are listed in Table 3-1. New wells also contain "MW" within their alpha-numeric identification. All piezometers are new and were installed during this phase of investigations.

The monitoring wells were installed during the RFI in accordance with the following standards:

- *U.S. Environmental Protection Agency Standard Operating Procedures and Quality Assurance Manual*, Environmental Compliance Branch, Region IV, February 1, 1991;
- *Guidelines for Groundwater Monitoring Well Installation*, March 27, 1989, SOUTHNAVFACENGCOM; and
- *Environmental Protection Board (EPB) Rule 8, Proposed Amendments, Groundwater Resource Management, City of Jacksonville*, EPB, September 28, 1990.



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FIGURE 3-2
 PIEZOMETER LOCATIONS



**Table 3-1
Summary of Phase 1 Monitoring Well Installations**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU Number	Monitoring Well No.	Diameter (inches)	Total Depth (feet)	Screened Interval (feet bls)
2, 3, 4, 5, and 22	MPT-2-MW4R	2	13	3 - 13
	MPT-2-MW11S	2	11	2 - 11
	MPT-2-MW12D	2	24.5	14 - 24
	MPT-2-MW12S	2	12	2 - 12
	MPT-2-MW15DR	2	25	15 - 25
	MPT-2-MW15SR	2	15	10 - 15
	MPT-2-MW16DD	4	100	90 - 100
	MPT-2-MW16S	2	12	2 - 12
	MPT-2-MW17DD	4	125	115 - 125
	MPT-2-MW17S	2	13	3 - 13
	MPT-22-MW1	2	12	2 - 12
	11	MPT-11-MW3	2	17
13	MPT-13-MW4S	2	12	2 - 12
	MPT-13-MW5S	2	13	3 - 13
	MPT-13-MW6S	2	12	2 - 12

Notes: SWMU = solid waste management unit.
bls = below land surface.
S = shallow surficial aquifer.
D = deep surficial aquifer.
DD = secondary aquifer.
R = monitoring well replacement.

The total depth of wells range from 12 feet to 125 feet bls. Table 3-1 lists the monitoring well installation specifications for all wells installed during the Phase I RFI field program. Table A-1 in Appendix A lists the locational survey data for these monitoring wells. Table 1-1 summarized all well and piezometer specification for both the Expanded Site Investigation (ESI) and the Phase I RFI.

The monitoring wells were installed from January 1992 through February 1992. Boreholes for shallow and intermediate monitoring well installation (maximum depth of 25 feet bls) were advanced using the hollow-stem auger (HSA) technique. Boreholes for secondary aquifer monitoring wells were advanced by a combination of HSA and mud rotary techniques. Continuous split-spoon samples were collected from the land surface to the water table using a 2-foot long, 1.75-inch inner diameter (ID) split-spoon sampler. Thereafter, the split-spoon samples were collected at 5-foot intervals. Soil samples from the split spoons were screened for volatile organic compounds using a Foxboro™ organic vapor analyzer (OVA).

The samples were described by the ABB-ES field geologist who recorded the texture, color, grain size, and other characteristics of the soils recovered from the borings. Standard penetration tests (American Society of Testing Materials [ASTM] D1586-84) were conducted at 5-foot intervals throughout each boring. The soils were classified using the Unified Soil Classification System (USCS). The information was used to provide a detailed record and to assist in the determination of the depth interval to install the monitoring well screen.

A flush-mount steel well protector was installed and secured with concrete into the ground over all wells for protective purposes. Each well was provided with a gas tight lockable expansion plug and "keyed-alike" brass padlock. A concrete pad was placed at land surface around each protective casing to secure the casing and to prevent surface runoff from entering the borehole. Wells were identified using Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) identification scheme (U.S. Navy, 1989). Four protective steel posts were installed around the monitoring wells in vehicular traffic areas in accordance with SOUTHNAVFACENGCOM's specifications guideline. Well installation and development were performed in accordance with SOUTHNAVFACENGCOM guidelines.

At least 24 hours after the monitoring well installation was completed, each well was developed by pumping and surging until the well produced sediment-free groundwater. The following is a detailed description of the procedures used to install piezometers and shallow, intermediate, and deep monitoring wells at NAVSTA Mayport. The rationale for well depths and screen placement are presented in Volume 1, RFI Workplan (U.S. Navy, 1991a).

3.2.1.1 Installation of Piezometer Network Prior to monitoring well installation, the network of 32 shallow piezometers was installed to collect groundwater elevation data in the surficial aquifer. Piezometers were installed vertically so that they penetrated the aquifer to a depth that is below the expected low water table elevation. To compensate for potential variations caused by tidal influences, piezometers were installed at least 5 feet below the observed groundwater elevations found during installation. The initial information obtained from piezometer groundwater measurements was then used to assess whether the previously chosen locations for the new additional monitoring wells would intercept potential contaminant plumes if present. The initial piezometer measurements verified the previously selected well locations as

adequate based on field estimates of groundwater gradients obtained from the piezometers.

Temporary piezometers were installed at predetermined locations modified by site-specific conditions. Boreholes for the piezometer installation were advanced to 5 feet below water surface using the HSA technique. Piezometers were constructed of 2-inch ID, Schedule 40 polyvinyl chloride (PVC) with a 5-foot section of 0.010-inch slotted PVC well screen. The annulus around the screen was packed using 20/30 grade silica sand. Once the piezometers are installed, they were surveyed and water level measurements were obtained and plotted to determine groundwater flow direction.

Overall average piezometer depth was about 10 feet bls; however, individual piezometer depths varied from installation to installation. Piezometers installed on the berms around the dredge spoil areas typically penetrated approximately 25 to 30 feet of dredge fill material prior to encountering the water table. In contrast, the water table was encountered within 3 feet of the ground surface in areas near tidal creeks. Piezometer locations are presented in Figure 3-2.

3.2.1.2 Installation of Shallow and Intermediate Surficial Aquifer Monitoring Wells Shallow monitoring wells (less than 15 feet, identified with "S" suffix) and intermediate aquifer wells (16 to 25 feet, identified with "D" suffix) were installed inside the augers. The augers were removed slowly during the placement of the 20/30 grade sand pack around the annulus of the well screen. This procedure minimized formation caving. In intermediate well installations, the sandpack was placed through a tremie pipe. Well screens for the shallow monitoring wells (0 to 15 feet) were placed from approximately 2 to 3 feet above the water table to approximately 8 feet below the water table. The annulus around the screen was packed using 20/30 grade silica sand to approximately 6 inches above the screen. Shallow wells have a 6- to 12-inch bentonite layer placed over the silica sand pack to prevent the grout mixture from influencing groundwater quality. This is a change from the original Workplan specifications that stated a 6-inch layer of fine-grained sand was to be used. Portland cement was tremied into the remaining annular space up to the ground surface to prevent direct infiltration of surface water into the well.

All monitoring wells, with the exception of deep wells, were constructed using threaded 2-inch ID Schedule 40, PVC well casing. The well screens were typically 10 feet in length and constructed of 2-inch diameter PVC with 0.010-inch slots. Each well riser extended above ground level. A surface flush, protective steel casing was installed and cemented into the ground over the PVC well riser. The PVC riser is equipped with a locking expansion plug and steel access cover. Concrete pads were placed around each protective casing to prevent surface runoff from entering the borehole. Four steel posts painted Department of Transportation (DOT) yellow were placed around monitoring wells located in areas near vehicular traffic.

3.2.1.3 Installation of Deep Monitoring Wells Two double-cased deep wells (100 feet and 125 feet in depth) were completed to the top of the Hawthorn Group prior to the installation of the shallow and intermediate monitoring wells. The lithology in these borings was sampled at 5-foot intervals for their entire depth to obtain stratigraphic information on subsurface geology. The shallow and

intermediate wells were later constructed using knowledge of the stratigraphy recorded during the previous studies and the installation of the deep wells and piezometers. This confirmed that well depths and screened intervals were appropriate as specified in the Workplan. The deep wells constructed to the top of the Hawthorn Group are identified with a "DD" suffix.

An initial 12-inch diameter borehole was bored through the overburden in an attempt to penetrate the first clay confining layer (estimated to be between 25 to 50 feet bls depending on the location at the site). The borehole was advanced by mud rotary techniques to approximately 60 feet bls where a 10-inch PVC casing consisting of 20-foot lengths was placed. This material specification is an exception to SOUTHNAVFACENGCOM's guidelines to use steel due to the corrosive nature of the high dissolved solids in the surficial aquifer. The 20-foot lengths were joined using stainless-steel screws, a PVC cap was installed at the bottom of the 60-foot casing assembly, and the PVC casing was filled with tap water to counter buoyancy of drilling mud in the open boring.

The annulus was filled with grout by placing a tremie tube in the annular space and pumping the grout from the bottom of the borehole to the surface. The grout used to seal the outer annular space was a cement-bentonite grout (90/10 by weight). The drilling contractor verified the mixture in the field using a mud scale. The casing was held in place with the weight of the rig until the grout had set.

After the grout had cured, the boring to install the inner casing was advanced through the protective outer casing seal using an 8-inch mud-rotary bit. While drilling through the PVC cap, care was taken to prevent cracking, shattering, and/or washing out the PVC casing and grout seal. The drilling fluid was circulated to remove the fines after advancing the boring to the screened interval depth.

The inner casing of the deep monitoring wells was constructed of 4-inch ID, flush-threaded, Schedule 40 PVC with machine-slotted PVC well screen (0.01-inch slot size) 10 feet in length. The annulus around the screen was filled with 20/30 grade silica sand. Sand (20/30) was placed around the screen using a tremie pipe to a depth of approximately 2 feet above the screened interval. A very fine-grained flour sand was installed in the same manner to seal the sand pack from the grout, which was then installed from the top of the upper sand pack to the surface using a tremie tube. Drilling fluids that had entered the well along with fines were removed during the subsequent development process.

3.2.1.4 Disposal of Soil Cuttings, Well Water, and Drilling Fluids Chemical analyses of soil cuttings and drilling fluid samples generated during monitoring well construction and sampling indicated that they were non-hazardous waste.

Soil cuttings were disposed onsite within the assumed area of contamination (USEPA, 1991c) near the well location where they were generated. Cuttings were spread to prevent creating a nuisance condition, physical hazard, or drainage problem. The cuttings were placed so they would not be eroded by surface water or rainfall to become sediment loads in nearby surface waterways such as ditches, curbs, or swales.

Well water from drums identified as being non-hazardous waste were disposed of onsite within the assumed area of contamination. Non-hazardous well water was disposed of as near as possible to the well location from which it was produced. The method of disposal was pouring the well water onto the ground surface and allowing the water to percolate into the surficial aquifer. Care was taken to assure that the well water did not flow into surface waterways such as ditches, curbs, or swales. Well water from MPT-2-MW17DD had an abnormally high pH (\approx pH 10) due to drilling fluids introduced during well construction. This water was treated using sodium sulfite (commercially available home pool chemical) to lower the pH to approximately 7 prior to disposal.

The drilling fluids generated by the placement of the two deep wells were disposed of in a shallow excavation 15 feet square by 3 feet deep approximately 50 feet west of MPT-2-MW-16DD within an assumed area of contamination. After construction of the shallow excavation and placement of the drilling fluids, the drilling mud was covered with the spoils from the excavation, field compacted using a backhoe, and graded to aid runoff from the excavated area.

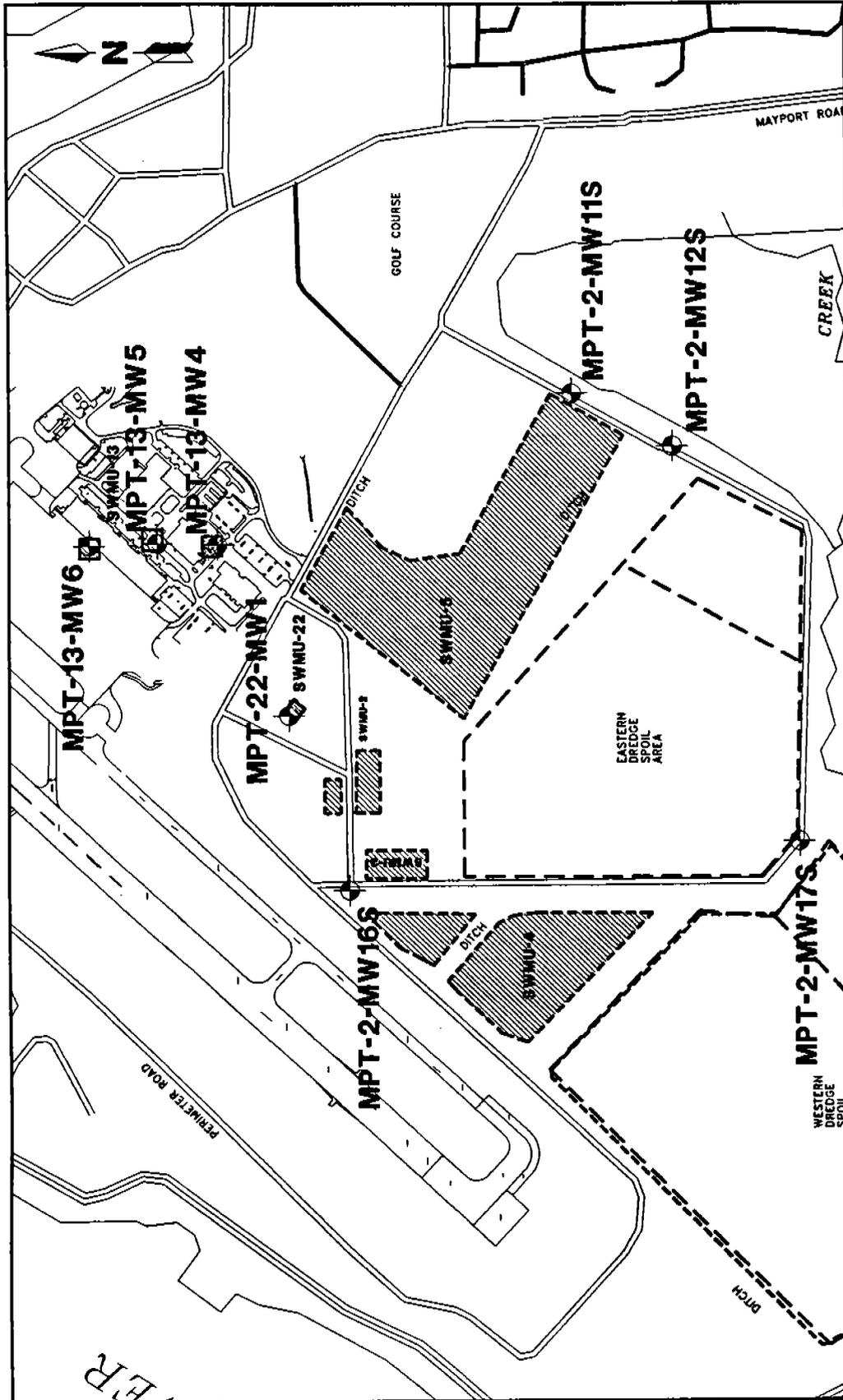
Personal protective equipment (PPE) not contaminated with RCRA hazardous wastes was collected and placed in double, heavy duty polyethylene bags and disposed of in a dumpster used for non-hazardous industrial debris designated by Navy personnel. PPE suspected of being contaminated with potential RCRA hazardous waste was given to the NAVSTA Mayport hazardous waste management coordinator for proper disposal.

Empty drums were transported and stacked in the "lay-down" area near MPT-2-MW-16DD for reuse in subsequent phases of the RFI. The drums were stored in a manner that minimized the area required while maintaining easy access.

3.2.2 Soil Sampling Surface or near-surface soil samples were collected from six SWMUs and other selected locations (SWMUs 2, 3, 4, and 5; SWMU 13; SWMU 22; the PCB-contaminated area adjacent to SWMU 2; and background sediment sampling stations) under investigation at NAVSTA Mayport. The objective of the soil program is to assess the concentration of contaminants in the soil due to past releases of contaminants at NAVSTA Mayport. Data derived from this investigation are used in the Health and Environmental Assessment, Chapter 5.0.

Surface and subsurface soil samples were collected from the locations described in Section 3.3 of the Sampling and Analysis Plan (U.S. Navy, 1991b). The general sample locations are presented in Figure 3-3. All samples were sent to the laboratory for analyses of selected compounds listed in Section 3.4 of the Sampling and Analysis Plan (U.S. Navy, 1991b). All soil samples were collected in accordance with procedures discussed in Section 6.6.4 of the Quality Assurance Project Plan (QAPP) (Appendix A) and the site-specific Quality Assurance Plan (QAP) (Appendix B) (U.S. Navy, 1991b). Eight soil samples (excluding duplicates) were collected from boreholes during monitoring well construction. Eight soil samples (excluding duplicates) were collected from shallow hand-auger borings at MPT-22. Forty-two surface soil samples (excluding duplicates) were collected at the PCB soil area near SWMU 2 for laboratory analysis (SW846 USEPA Method 8080 for PCBs).

Samples for volatile organic compound (VOC) analysis were collected directly from the auger bucket. Samples collected for other analyses were thoroughly mixed in



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FIGURE 3-3
 SUBSURFACE SOIL SAMPLES
 (COLLECTED DURING NEW MONITOR
 WELL CONSTRUCTION)

a glass bowl with a stainless-steel spoon to obtain homogeneous samples. Each sample fraction was then placed in the appropriate container for shipment to the analytical laboratory.

All sampling equipment was thoroughly decontaminated in accordance with procedures presented in Appendix B of the USEPA, Environmental Services Division (ESD) Region IV Standard Operating Procedures (SOPs) (USEPA, 1991b) and the Project specific QAP, RFI Workplan, Volume II (U.S. Navy, 1991b).

3.2.3 Surface Water and Sediment Sampling Marshes, ditches, and the St. Johns River are the primary water bodies that receive groundwater and surface water. Surface water and sediment samples for laboratory analysis were obtained from these surface water features at: SWMUs 2, 3, 4, and 5; SWMU 13; and the background stations. The intent of the program was to evaluate whether the surrounding wetlands and rivers have been affected by contamination from the Group I SWMUs at NAVSTA Mayport. Data derived from this subtask are used in the Health and Environmental Assessment.

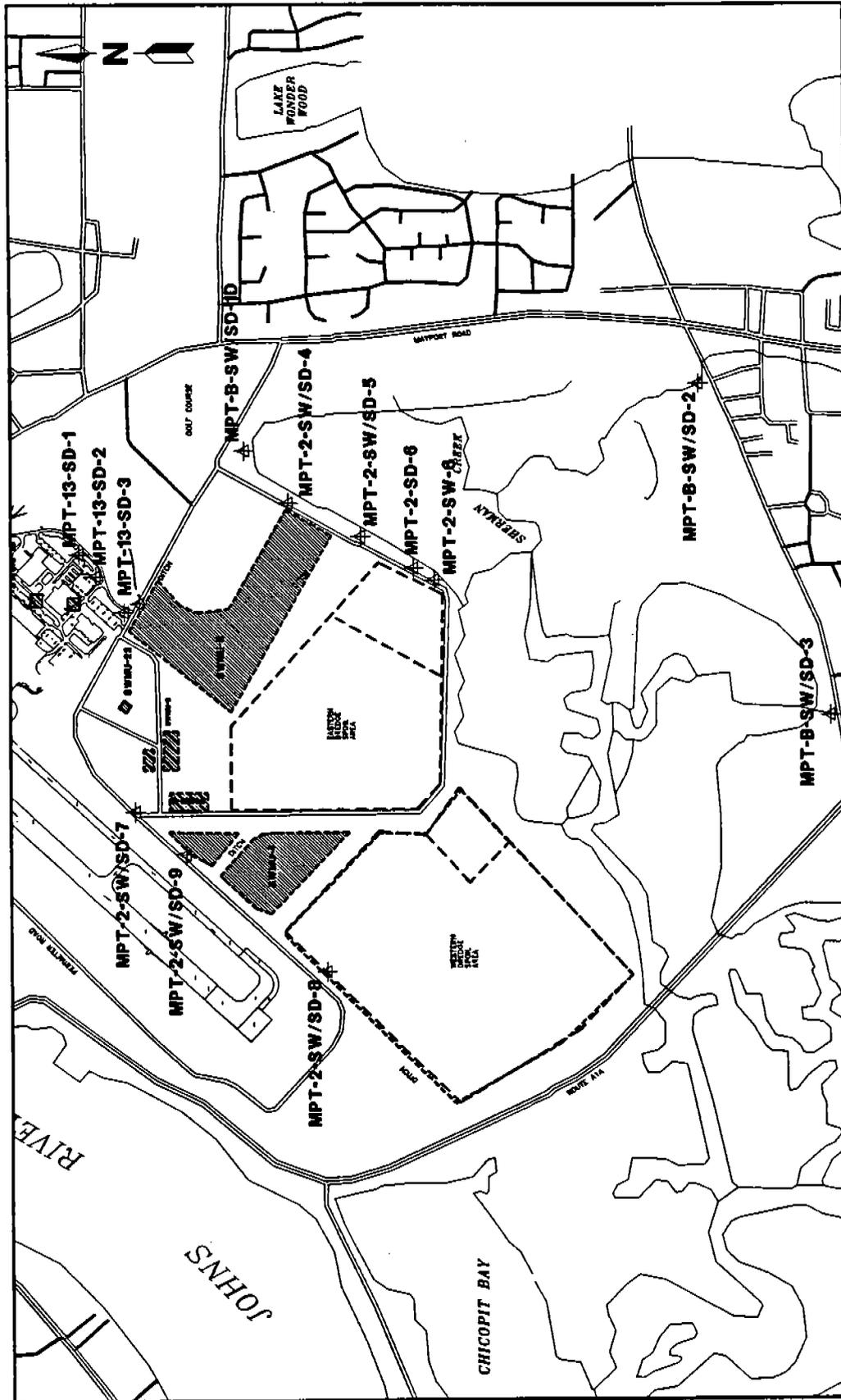
In order to assess chemical constituents in surface water, a total of 9 surface water and 12 sediment samples with duplicates and QA/QC samples were collected from the stations. These sample stations are presented on Figure 3-4. All samples were sent to the laboratory for analyses of the selected Appendix IX constituents.

Samples were collected in accordance with procedures discussed in Sections 6.7.3 (surface water) and 6.6.5 of the QAPP (Appendix A) and the site-specific QAP (Appendix B) of the RFI Workplan (U.S. Navy, 1991b). Surface water samples were collected by dipping a pre-decontaminated sampling container directly into the water. Where the water was not sufficiently deep to permit the use of this approach, a decontaminated glass beaker was used to transfer the sample into the container.

Sediment samples were collected using a 2-inch diameter stainless-steel tube. The sediments were transferred to a glass bowl for mixing and placed into the sample container(s). Sediment samples for volatile organic analysis were removed from the sampling tube and deposited directly into 2-ounce precleaned glass jars equipped with Teflon[™]-lined lids prior to mixing. All samples were placed on ice for shipment to the laboratory.

3.2.4 Groundwater Sampling To assess groundwater quality, a total of 28 groundwater samples were collected from the new and existing monitoring wells located at the Phase I sites under investigation at NAVSTA Mayport. Background and duplicate groundwater samples were also collected. All samples were collected in accordance with procedures discussed in Section 6.7.2 of the QAPP (Appendix A; U.S. Navy, 1991b) of the RFI Workplan.

All monitoring wells were purged to remove at least five well volumes of water prior to sampling. Measurements of pH, specific conductance, and temperature were recorded for each well to confirm that adequate water volumes had been purged and that representative groundwater samples were being collected. Precleaned Teflon[™] bailers and monofilament lines were used to collect the samples. Samples were collected in the following order: VOCs, semivolatile

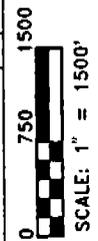


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FIGURE 3-4
SURFACE WATER AND SEDIMENT
SAMPLE LOCATIONS



organic compounds (SVOCs), pesticides, PCBs, and metals. Groundwater samples were packed in ice and shipped to the laboratory for analysis.

3.2.5 Background Characterization In order to document the concentration of chemicals in areas of the base that were not affected by past waste management practices, background samples of sediment, surface water, and groundwater were collected and analyzed.

Three background sediment samples were collected. Two background sediment samples were collected from tributaries to Sherman Creek just outside the base boundary (MPT-B-SW/SD-2 and MPT-B-SW/SD-3) and one was collected from a drainage ditch west of the perimeter road and south of the golf course (MPT-B-SW/SD-1).

During Phase 2 of the RFI, background soil samples will be collected from the area west of the main runway (MPT-B-SS-1, MPT-B-SS-2, and MPT-B-SS-3), in the wooded area between Mayport Road and the golf course (MPT-B-SS-4), south of Lake Wonderwood in the base housing area (MPT-B-SS-5), and in a wooded area in the northeast corner of the base (MPT-B-SS-6).

Monitoring well MPT-1-1 and Geraghty & Miller well S-1 were used as background groundwater sampling locations. Monitoring well MPT-1-1 is located just south of the Jacksonville Shipyards at SWMU 1 and is upgradient of that site. No contaminants were observed in monitoring well MPT-1-1 during the ESI. Geraghty & Miller monitoring well S-1 is located south of SWMUs 8 and 10, and is upgradient of those sites. A background groundwater sample was not collected from Duval County monitoring well DS-263 as specified in the Workplan. This well could not be located; it is believed to be a fountain at the entrance of a local park off Wonderwood Drive.

All background samples were analyzed for selected Appendix IX metals, VOCs, SVOCs, organochlorine pesticides, and PCBs using USEPA SW-846 Methods.

3.2.6 Hydrogeologic Investigations Groundwater hydraulic characteristics were investigated by (1) development of an average potentiometric surface map, (2) a tidal study to determine tidal fluctuation effects on the water table aquifer and groundwater movement, and (3) slug tests to estimate the spatial variability of hydraulic conductivity within the surficial aquifer. These three investigations are described below.

3.2.6.1 Average Potentiometric Water Surface Water levels were measured in all existing and newly installed wells and piezometers relative to a common datum (National Geodetic Vertical Datum of 1929 [NGVD 1929]). Groundwater levels were measured on three separate occasions: February 16, March 25, and April 20, 1992. The initial event on February 16 was conducted in conjunction with the 48-hour tidal survey study. The groundwater levels were measured after each well had reached equilibrium with atmospheric pressure. All wells were typically measured within a 4-hour period in an attempt to minimize tidal influences on groundwater elevation measurements. Wells located near tidally influenced water bodies were measured first to minimize variation due to tides.

The groundwater elevation was obtained by direct reading from an electric tape suspended in the well and read from a designated point marked on the PVC riser (the north side of the riser). Measurements were recorded in a field book. The

water indicator probe was then decontaminated prior to subsequent use as specified in the RFI Workplan (U.S. Navy, 1991b).

Data from the groundwater elevation survey were plotted on maps of the Mayport facility for each event. A map was also produced by contouring the average total hydraulic head values of the three events (this map is presented as Figure 4-4 in Chapter 4.0 in the discussion of findings). Hydraulic gradients ($\Delta h/\Delta L$) were determined in selected directions.

3.6.2.2 Tidal Survey A tidal influence study was conducted at NAVSTA Mayport on February 15 and 16, 1992. These dates were near a waxing full moon when the tidal range was near its maximum. The tidal study included water level measurements from selected monitoring wells near the St. Johns River and the tidal creeks near SWMUs 2 and 5. Wells were monitored for a 48-hour period. Four wells and one piezometer were monitored electronically with pressure transducers and data loggers. Other wells were measured manually on varying schedules depending on their observed response to tidal influences. Monitoring for a 48-hour period ensured that the data covered a minimum of two complete tidal cycles. The raw data were tabulated, and water level data reduced and analyzed.

3.2.6.3 Aquifer Slug Test Subsequent to sampling monitoring wells, initial hydraulic conductivity tests (slug tests) were conducted in 33 piezometers and monitoring wells to determine the hydraulic conductivity of the surficial aquifer. A set of three rising and three falling head slug tests were performed in each well tested. Only rising head tests were performed in wells that are screened across the water table. The slug test consists of either the introduction or withdrawal of a slug (PVC tube filled with sand) that displaces a known volume of water and the measurement of the change in water level in the well with respect to time. The rates of recovery were measured with a pressure transducer and a digital data logger. The time versus water level recovery data were then processed by a computer program (AQTESOLV™) that employs the method of Bouwer and Rice (1976) to calculate hydraulic conductivity for unconfined aquifers.

3.6.2.4 Well Elevation and Location Survey A well elevation and location survey was conducted by a Florida-registered professional land surveyor. The horizontal location and elevation of water level measuring points were surveyed for each new and existing monitoring well and piezometer installed at NAVSTA Mayport. Third-order accuracy was specified for the survey. Horizontal locations were surveyed to an accuracy of 0.1 foot and elevations were surveyed to an accuracy of 0.01 foot. Horizontal locations of monitoring wells and piezometers are referenced to the State Plane coordinate system. All elevations are based on the NGVD 1929 datum.

3.2.7 Biological Field Investigations Biological field investigations were completed at NAVSTA Mayport during the week of January 20, 1992. The biological field investigations were conducted by KBN Engineering and Applied Sciences (KBN). The objectives of the investigations included:

- identification and characterization of the ecological setting, including aquatic and terrestrial habitats;

- identification of organisms (receptors) within those habitats; and
- identification of potential areas of ecological effects in the aquatic habitats.

Investigative objectives were accomplished by conducting a qualitative aquatic survey, quantitative macroinvertebrate sampling, and terrestrial field surveys at selected locations at NAVSTA Mayport. The aquatic surveys included qualitative sampling of fish, invertebrates, and plants, and quantitative sampling of benthic macroinvertebrates. The terrestrial surveys included identification and characterization of terrestrial wildlife habitats on and around the SWMUs, identification of wetlands, and documentation of any wildlife sighted.

All components of the biological investigation were conducted by KBN according to the RFI Workplan (U.S. Navy, 1991b). The biological investigation report from KBN is included as Appendix C. The results of the investigation are discussed in Chapter 4.0 and are used in Chapter 5.0 to support the Ecological Assessment.

3.2.7.1 Aquatic Biological Surveys Twelve stations were chosen for the aquatic survey (Figure 3-5) including three reference stations (MPT-B-BIO-1, MPT-B-BIO-2, and MPT-B-BIO-3). Six aquatic survey stations (MPT-2-BIO-2, MPT-2-BIO-4, MPT-2-BIO-5, MPT-2-BIO-6, MPT-2-BIO-8, and MPT-2-BIO-9) are located near SWMUs 2, 3, 4, 5 (Navy IR program Sites 2, 4, 5, and 6), and three stations (MPT-13-BIO-1, MPT-13-BIO-2, and MPT-13-BIO3) are near SWMU 13. The aquatic survey included qualitative sampling at all 12 stations. Quantitative macroinvertebrate samples were collected at all stations except the stations near SWMU 13 (Navy IR program Site 13) (i.e., MPT-13-BIO-1, MPT-13-BIO-2, and MPT-13-BIO-3). These latter three locations are associated with aquatic habitats in drainage ditches, which serve the adjacent golf course area and SWMU 13 watershed.

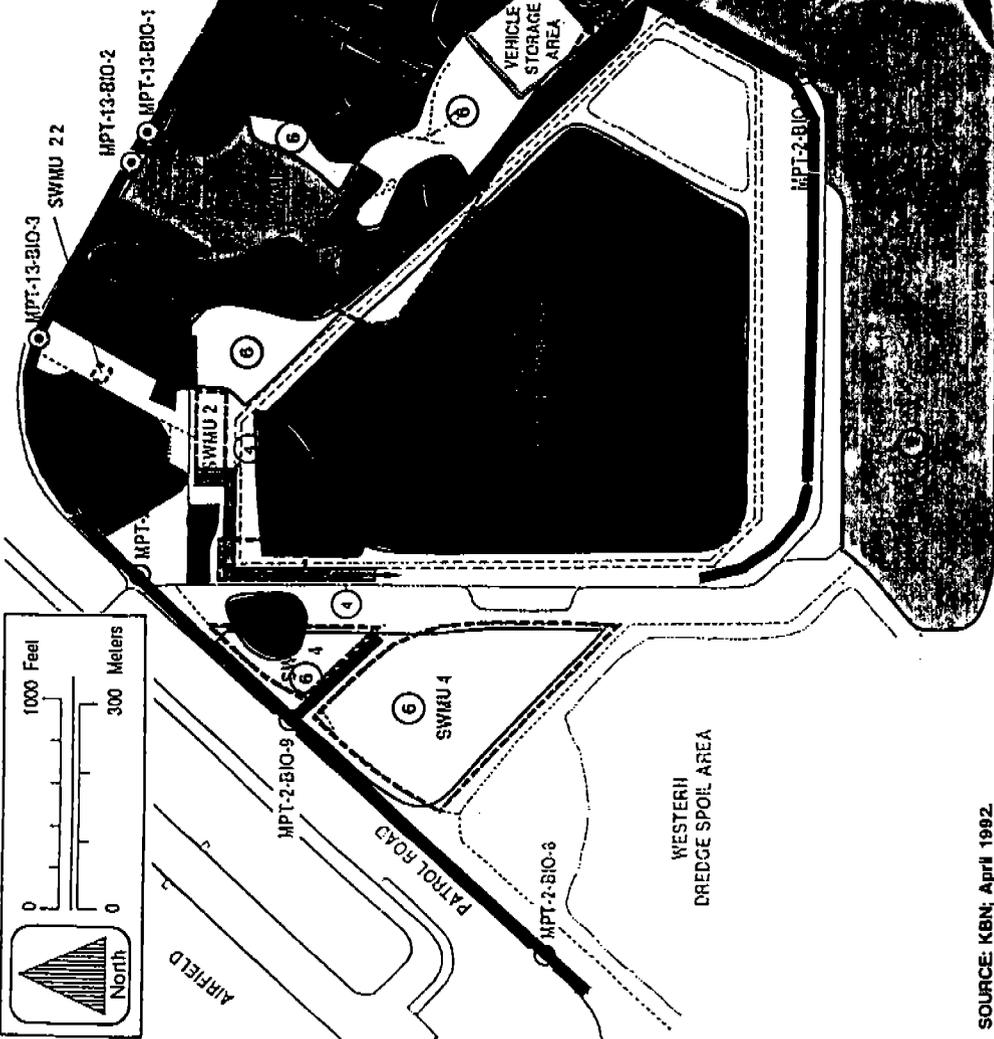
Qualitative Aquatic Survey. The qualitative survey included measurements of basic water quality parameters, descriptions of habitats, and collection of organisms at each station. Water quality parameters collected include: depth, width, bottom substrate type, water clarity, water flow, conductivity, salinity, pH, temperature, and dissolved oxygen levels. Conductivity, salinity, pH, temperature, and dissolved oxygen levels were measured using a Hydrolab Corporation Surveyor® II. Water flow was estimated using a drogoue timed over a measured distance. Calibration and use of instrumentation are described in Volume II, Appendix C.

Fish and macroinvertebrates were collected from as many different habitats as possible at each station using D-frame aquatic dip nets and seines. These samples were fixed with 10 percent formalin. Phytoplankton and zooplankton were collected using a 2-inch (5.1 centimeter [cm]) PVC tube to collect a surface to near bottom water column sample. A minimum of five water column samples were pooled to collect approximately 1,000 millimeters (ml) of water for analysis. Samples were fixed with a 2 percent Lugol solution. Preserved aquatic organisms were sorted in the laboratory and identified to the lowest practical taxonomic level. The results are discussed in 4.4.

Quantitative Macroinvertebrate Sampling. The objective of the quantitative part of the aquatic survey was to identify whether water quality and sediment impacts

LEGEND

	SWAMP BOUNDARY
	AQUATIC BIOLOGICAL SAMPLING STATION
	SPOIL AREA
	DRAINAGE DITCH INDICATING DIRECTION OF FLOW
	DIRT ROAD
	DEEM
	OPEN FIELD



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**FIGURE 3-5
LOCATION OF TERRESTRIAL HABITATS
IN RELATION TO SWMUS AND AQUATIC
BIOLOGICAL SAMPLING STATIONS**

SOURCE: KBN, April 1992.

to aquatic biota and community structure were evident due to releases from SWMUs 2, 3, 4, and 5 (Navy IR program Sites 2, 4, 5, and 6), by comparison to reference stations. An additional objective was to identify possible indicator species if present. To accomplish this, benthic macroinvertebrates were collected from stations in the study area and the three reference stations by three replicate quantitative grab samples of sediments using a petite ponar dredge. The sediment samples were sieved through a 0.5 millimeter (mm) screen and fixed in 10 percent formalin with Rose Bengal stain added. Organisms were recovered from the preserved sediment samples in the laboratory, sorted, and identified to the lowest practical taxonomic level.

Surface water quality is reflected in macroinvertebrate species composition and diversity, population density and biomass, and physiological condition of indigenous communities of aquatic organisms (USEPA, 1990). Quantitative grab samples of the benthic macroinvertebrate community at the survey stations provides data on standing crop (biomass or numbers), species richness (number of taxa), and species composition. Standing crop and species richness in a community are highly sensitive to natural and anthropogenic disturbances, such as the introduction of contamination. Toxic substances, siltation, and low pH generally reduce standing crop and species richness, whereas inorganic nutrients or low dissolved oxygen (DO) increase standing crop and reduce richness (USEPA, 1990).

For each station, basic parameters of standing crop (density in number of individuals per square meter), species richness (number of taxa), and species composition (percent of composition of dominant taxa) were recorded. The structure and function of aquatic benthic communities (e.g., biological integrity) are defined in Chapter 17-3, Florida Administrative Code (FAC), in terms of the Shannon-Weaver diversity index of benthic macroinvertebrates (FAC, 1992). Chapter 17-3, FAC, states that for surface waters of Class III and above, biological integrity shall not be reduced to less than 75 percent of background. The Shannon and Weaver index and an additional four indices (Margalef's Index, Equitability Index, Evenness Index, and Community Loss Index) of community structure and function were calculated. The calculated indices are presented and discussed in Section 4.4. Formulas for the indices are presented in Appendix C.

3.2.7.2 Terrestrial Survey Qualitative terrestrial ecological surveys were conducted on January 23, 1992, to obtain information on wetlands and terrestrial vegetation on and around SWMUs 2, 3, 4, 5, and 13 (Navy IR program Sites 2, 4, 5, 6 and 13). The results of the surveys were used in Section 5.2 to characterize wildlife habitats, identify receptors, and identify potential exposure pathways for the receptors.

Wetlands. Wetland identifications were made following guidelines of the U.S. Army Corps of Engineers (USACE, 1989) and the FDER (Chapter 17-301, FAC). Each site was examined for topographic features and vegetation that would characterize the area as wetlands. The wetlands identified are characterized in Section 4.4 based on vegetation. This is not a full wetland identification as soil type and hydrology were not characterized.

Terrestrial Wildlife. A terrestrial survey was completed by a wildlife biologist and a wetland biologist to identify terrestrial wildlife habitat and wildlife (Figure 3-5). The one-day terrestrial survey was accomplished by systematic

walkover throughout each SWMU. During the survey, wildlife species were identified through actual observations, as well as from tracks, scat, and bird calls. SWMUs were visually inspected for evidence of listed endangered species, threatened species, or species of special concern, as well as habitats in which they could reasonably be expected to occur. The terrestrial survey information obtained was augmented by observations of the field personnel conducting the aquatic sampling.

Prior to the survey, the IAS (ESE, 1986) was examined for information on reported habitats and wildlife species. A list of endangered species, threatened species, and species of special concern for Duval County, Florida, was obtained from the Florida Natural Areas Inventory (Muller, 1990). Those species that may live in habitats found near the SWMUs were reviewed. The habitats identified and wildlife observed are discussed in Chapter 4.4.

3.3 DEVIATIONS FROM FINAL WORKPLAN. The following deviations from the RFI Workplan were made during the field program in response to encountered field conditions to enable the investigation to continue in an expeditious manner.

During soil sampling at MPT-2-16S, it was noted that the 2-foot stainless-steel sampling sleeve was not filling completely. This allowed the development of head space within the sample tube, which would cause the potential loss of volatile components from the samples. Alternate methods of obtaining the sample using the sleeve were not successful so the tube system was abandoned. Therefore, the well was placed and the sample was obtained later using a decontaminated stainless-steel hand auger at the appropriate depth. The borings for monitoring wells MPT-2-11S, MPT-2-12S, MPT-2-16S, MPT-2-17S, MPT-13-4, MPT-13-5, MPT-13-6, and MPT-22-1S were sampled in the same manner. The analytical results obtained from adjacent sampling locations should provide sufficient information regarding contaminant migration and concentration at that location and sample depth.

Development of MPT-2-MW-17DD was not successful. This well is 125 feet deep. It has a 4-inch ID and an average water column of 121 feet. The well requires approximately 48 hours to recharge to 90 percent of capacity. Water withdrawn from the well during development did not reach equilibrium as measured by pH. The average pH of water removed did not register below 10 due to drilling fluids introduced during well construction (e.g., grout). Three separate attempts were made to develop the well, including swabbing the well in an effort to increase permeability of the sand pack, thereby increasing the recharge rate. More than 600 gallons of water were removed during these efforts and stored on location. Consequently, sampling of the well was not possible during this phase of the investigation. Water elevation data were collected from this well after full recharge and used in the hydrologic assessment. Well development and sampling will be attempted during a subsequent phase of the RFI.

3.4 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC). The goal of this section is to summarize the overall quality of the sample results from Phase 1 of the RFI. It describes the field and laboratory QA/QC procedures followed during the investigation and provides an overall assessment of data quality based on the data validation process. Data validation is the technical review of individual analytical results relative to the criteria defined by the data quality objectives and the QAPP. The data quality objective (DQO) for the Phase 1 RFI was to obtain Neesa Level C data. The data validation process described in this

section assessed each data package individually for laboratory performance, but did not evaluate the analytical results relative to other QA/QC samples such as trip, field, or rinsate blanks. The evaluation of the analytical results relative to their applicable QA/QC samples is summarized separately for validated data obtained for specific samples and target compounds.

3.4.1 Field QA/QC

3.4.1.1 Field QA/QC Samples Three types of field blank QA/QC samples were used to monitor the existence and magnitude of contamination problems introduced by field activities. The three types were as follows.

- Equipment Rinsate Blank. After a piece of sampling equipment was decontaminated, it was rinsed with ASTM Type II water (provided by the analytical laboratory); a sample of this final rinse water was submitted as an equipment rinsate blank. This blank was used to monitor contamination that may have been introduced because of incomplete equipment decontamination. One rinsate blank per day was analyzed for the same analytical parameters as the corresponding samples.
- Field Blank. This was a sample of the water that was used for rinsing equipment. This blank was used to monitor contamination that may have been introduced by the rinse water. One field blank for each batch of decontamination water, or one per field event, was analyzed for the same parameters as the corresponding field samples.
- Trip Blank. This was used to monitor possible VOC contamination during the sample container trip. This blank consisted of a VOC sample container (40 ml vial) that was filled in the analytical laboratory with ASTM Type II water before being sent to the field. The trip blank sample container was not opened in the field and was shipped back to the laboratory in a cooler containing field samples for VOC analyses. One trip blank was included in each shipping container that contained samples for NEESA Level C VOC analysis.

Additionally, one duplicate field sample was collected for every 10 field samples of the same matrix. Field duplicate samples were used to monitor sampling accuracy and precision. In addition to field duplicate samples, additional samples were collected for laboratory matrix spike and matrix spike duplicates.

3.4.1.2 Field QA/QC Review Tables 3-2 and 3-3 summarize the organic and inorganic field blank results.

Because QC samples were collected by the day rather than by site, an extra column has been added to the summary table that specifies the source of the QC sample. One trip blank was included in each cooler that contained samples for VOC analysis. If more than one cooler containing samples for VOC analysis was shipped on a given day, then trip blanks were included in all the coolers. One equipment rinsate blank was collected each day that NEESA Level C samples were collected. The source of the equipment rinsate blank (bailer, split spoon, or hand auger) is indicated in the second column. One field blank was collected from each source of decontamination water used during each field event. The

Table 3-2
Organic Blank Contamination

Phase 1 RCRA Facility Investigation
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Sample Designation, SDG Number	Date and Type of Sampling Event	Contract Required Detection Limit (µg/l)														
		Acetone	bis(2-Ethyl-hexyl) phthalate	Bromo-dichloro-methane	Bromo-form	2-Butanone	Carbon disulfide	Chloro-benzene	Chloro-form	Dibrom-o-chloro-methane	Di-n-butyl-phthalate	Di-ethyl-phthalate	Methylene chloride	Toluene		
MPT-ER-1 20723	1/21/92 Sediment ¹	4 BJ	10	5	5	5	5	5	5	5	10	5	5	5	6 BJ	
MPT-ER-2 20722	1/22/92 Sediment ¹	5 BJ				7 BJ									3 BJ	
MPT-ER-3 20740	1/23/92 Sediment ¹	8 BJ				7 BJ						5 BJ			9 BJ	
Rig water 20735	1/24/92	8 BJ		12	2 J	9 BJ			11	9		10 B			9 B	
Rinsate 20735	1/24/92 Soil ²	12 B				8 BJ			3			9 BJ			7 B	1 J
Field blank 2 20753	1/24/92	9 BJ				8 BJ						7 BJ			3 BJ	
Trip blank 4 20753	1/29/92	5 BJ				9									4 BJ	
MPT-RB-01 20837	2/05/92 Baller rinsate ³	7 BJ							6							
Travel blank 20837	2/05/92	10 B													8	
MPT-FB-01 20837	2/05/92	7 BJ													2 J	

See notes at end of table.

Table 3-2 (Continued)
Organic Blank Contamination

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Designation, SDG Number	Date and Type of Sampling Event	Acetone	Bis(2-ethyl-hexyl) phthalate	Bromo-dichloro-methane	Bromo-form	Butanone	Carbon disulfide	Chloro-benzene	Chloro-form	Chloro-dibromo-methane	Di-n-butyl-phthalate	Di-ethyl-phthalate	Methylene chloride	Toluene
		10	10	5	5	10	5	5	5	5	10	10	5	5
Contract Required Detection Limit														
MPT-RB-02 20866	2/09/92 Bailer rinsate ^a	12 B	78					8			4 BJ		9 B	
MPT-FB-02 20866	2/09/92	10 B	51				8				5 BJ		2 BJ	
Trip blank 20884	2/11/92	13 B											8 B	
Trip blanks 20877	2/10/92	21 B											9 B	
MPT-RB-02 20902	2/12/92 Soil ²	5 BJ	6 J					12					9	
MPT-RB-03 20902	2/12/92 Bailer rinsate ^a	7 BJ	3 J					5					6	
MPT-RB-05 20902	2/12/92 Bailer rinsate ^a	5 BJ						12			3 BJ		6	
MPT-RB-06 20931	2/14/92 Bailer rinsate ^a	3 BJ						6	1 J				4 J	
Trip blank 20902	2/14/92												7	
Travel blank 20931	2/14/92	5 BJ											4 J	

See notes at end of table.

Table 3-2 (Continued)
Organic Blank Contamination

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Designation, SDG Number	Date and Type of Sampling Event	Acetone	bis-(2-Ethyl-hexyl) phthalate	Bromo-dichloro-methane	Bromo-form	2-Butanone	Carbon disulfide	Chloro-benzene	Chloro-form	Dibromo-chloro-methane	Di-n-butyl-phthalate	Dl-ethyl-phthalate	Methylene chloride	Toluene
		10	10	5	5	10	5	5	5	5	10	10	5	5
Contract Required Detection Limit														
MPT-2-QS-1 21018	2/24/92 Soil ²													
MPT-FB-1 20723	2/24/92	5 BJ			8 BJ								10 B	
MPT-2-FB-2 21060	2/27/92 Soil ²		4 BJ								3 J			
MPT-RB-01 21171	3/11/92 SWMU 22 Soil ²	21					9	6	2 BJ				9	
Trip blank 1 21171	3/11/92	8 J					2 J		1 BJ				5	
MPT-FB-04 21171	3/11/92	23 B						7				7 J	10 B	

¹Sediment sampling equipment includes: hand auger, stainless-steel spoon, stainless-steel tube, and glass bowl.

²Soil sampling equipment includes: hand auger, stainless-steel spoon and glass bowl.

³Water sampling equipment is Teflon[®] bailer.

All detected compounds reported in micrograms per liter.

Notes: FB = field blank.

ER = equipment rinsate.

QS = equipment rinsate.

RB = equipment rinsate.

Rig water = water from drill rig portable tank.

B = Compound was detected in QC blank.

J = Reported value less than quantitation limit.

SDG = Sample Delivery Group.

The rinsate was poured over all equipment used in the sampling event for each matrix.

**Table 3-3
Inorganic Blank Contamination**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Designation, SDG Number	Date and Type of Sampling Event	Sb	As	Ba	Be	Cd	Cr	Cu	CN	Pb	Ni	Se	Ag	Zn
		60	10	200	5	5	10	25	10	3	40	5	10	20
Contract Required Detection Limit														
MPT-ER-1 20723	1/21/92 Sediment ¹	47.5 J												
MPT-ER-2 20722	1/22/92 Sediment ¹	50.4												
MPT-ER-3 20740	1/23/92 Sediment ¹				0.66 J			1.7 J					3 J	6.4 J
Rig water 20735	1/24/92			24.5 J	0.64 J			22.3 J		2.4 J				23.9 J
Rinseate 20735	1/24/92 Soil ²				0.87 J				8.9 J					
Field blank 2 20753	1/24/92				0.64 J									
MPT-RB-01 20837	2/05/92 Bailer rinsate ³											1.4 J		
MPT-FB-01 20837	2/05/92											1.5 J		31.9 J
MPT-RB-02 20866	2/09/92 Bailer rinsate ³								4.3 J					
MPT-FB-02 20866	2/09/92			1.2 J										
MPT-RB-02 20902	2/12/92 Soil ²													2.2 J
See notes at end of table.														

Table 3-3 (Continued)
Inorganic Blank Contamination

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Designation, SDG Number	Date and type of Sampling Event	Sb	As	Ba	Be	Cd	Cr	Cu	CN	Pb	Ni	Se	Ag	Zn
		60	10	200	5	5	10	25	10	3	40	5	10	20
Contract Detection Limit														
MPT-RB-03 20902	2/12/92 Bailler rinsate ³													5.3 J
MPT-RB-05 20902	2/12/92 Bailler rinsate ³									0.7 J				3.5 J
MPT-RB-06 20931	2/14/92 Bailler rinsate ³													2.7 J
MPT-2-QS-1 21018	2/24/92 Soil ²													
MPT-FB-1 20723	2/24/92							18.4 J						
MPT-2-FB-2 20866	2/27/92 Soil ²													
MPT-RB-01 21171	3/11/92 SWMU 22 Soil ²									2.7 J	6 J			
MPT-FB-04 21171	3/11/92		0.88 J				2.5 J							7.1 J

¹Sediment rinsate equipment includes hand auger, stainless-steel spoon, stainless-steel tube, and glass bowl.

²Soil rinsate equipment includes hand auger, stainless-steel spoon, stainless-steel tube, and glass bowl.

³Bailler rinsate equipment includes TeflonTM bailer.

All detected compounds reported in micrograms per liter.

Notes: All detected compounds reported in micrograms per liter.

SDG = Sample Delivery Group.

FB = field blank.

ER = equipment rinsate.

OS = equipment rinsate.

RB = equipment rinsate.

Rig water = water from drill rig portable tank.

J = Reported value was less than CRDL but greater than or equal to instrument detection level.

source of the water (tap water or ASTM Type II water from the laboratory) is indicated in the second column. Low concentrations of both acetone and methylene chloride appeared in many of the field QC samples. Both of these chemicals are used as extraction solvents in the laboratory, and, hence are very common laboratory contaminants. The concentrations of acetone and methylene chloride are less than 10 times the concentrations detected in the corresponding laboratory method blanks. Therefore, the acetone and methylene chloride samples can be attributed to laboratory contamination. These and other organic and inorganic compounds suspected of being laboratory or field sampling contaminants are discussed in Section 3.4.9.

3.4.2 Laboratory QA/QC

3.4.2.1 Laboratory QA/QC Samples Method blanks were analyzed for Level C samples before the field samples and during sample analysis at a frequency outlined in the appropriate analytical method (SW-846). A method blank is ASTM Type II water that is treated as a sample in that it undergoes the same analytical process as the corresponding field samples. Method blanks were used to monitor laboratory performance and contamination introduced during the analytical process.

Level C laboratory QC samples can be categorized as either organic or inorganic QC samples. The two types of organic QC samples were as follows.

- Surrogate Spikes. Surrogate spike recoveries served to estimate accuracy and were added to every sample. Surrogate compounds are structural homologs of target compounds, often with deuterium substituted for hydrogen, and are therefore expected to behave in a similar manner during analysis. Spike recoveries were used to monitor both matrix effects and laboratory performance.
- Matrix Spike/Matrix Spike Duplicates (MS/MSDs). MS/MSDs were used to estimate the effect of the specific sample matrix on sample analyte recovery, as well as on accuracy and precision. Matrix spike compounds are found on the method target compound list (TCL). The field sample was split into thirds and two portions were spiked with known quantities of TCL compounds in order to ascertain the effects of the specific sample matrix on the recovery of these analytes of interest. One MS/MSD sample was analyzed for every 20 samples of the same matrix that were analyzed within a 14-day time period.

The two types of Level C inorganic QC samples were Laboratory Control Samples (LCS) and spiked (both pre- and post-digestion) samples.

- LCS. An LCS consists of an ideal matrix (usually ASTM Type II water) that has been spiked with a known amount of the analyte of interest; the LCS was prepared (digested) and analyzed with the field samples. The LCS is designed to monitor the efficiency of the overall analytical procedure, including sample preparation, and the resulting analyte recoveries must fall within pre-established acceptance limits.

- Spiked Samples. Pre-digestion spikes are analogous to the MS/MSD spike recovery for organic analyses in that they measure the effects of the sample matrix on the recovery of a known quantity of analyte after both sample preparation and analysis. If the pre-digestion spike recovery did not fall within the acceptance window of 75 to 125 percent, then a post-digestion spike monitors instrument performance and matrix effects. If both the pre- and post-digestion spike recoveries fell outside the acceptance limits, then the data were flagged to indicate the nonconformance.

3.4.2.2 Data Review and Validation Summary Before the analytical results were released by the laboratory, both the sample and QC data were carefully reviewed in order to verify sample identity, instrument calibration, detection limits, dilution factors, numerical computations, accuracy of transcriptions, and chemical interpretations. Additionally, the QC data were reduced and spike recoveries were included in control charts, and the resulting data were reviewed to ascertain whether they were within the laboratory defined limits for accuracy and precision. Any nonconforming data were discussed in the data package cover letter and case narrative.

The Level C data packages were reviewed and validated by Heartland Environmental Services, Inc. Data validation is the technical review of a data package using criteria established in the DQOs and the QAPP. The data were reviewed and validated using the NEESA (1988) guidance document 20.2-047B, *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Program*. The data review and validation process is independent of the laboratory's checks because it is impossible to repeat the laboratory's review as not all the raw data were included in the Level C data packages. Heartland prepared a summary of the data review and validation results and these cover letters are included as Appendix E. In the data validation process, qualifiers were added to sample results based on QA/QC problems and limitations of the data with respect to chemical identity, chemical concentration, or both.

The one-letter qualifier flags used in the data summary tables include the following.

- U Undetected. Analyte was analyzed for but not detected above the method detection limit. When used to qualify common laboratory contaminants (acetone, 2-butanone, methylene chloride, toluene, phthalate esters), the concentration of the common laboratory contaminant compound is qualified with a "U" if it less than 10 times the concentration detected in any of the blanks. The concentrations of other contaminants are qualified with a "U" if the contaminant concentration is less than 5 times the associated blank concentration.
- J Estimated. The analyte was present, but the reported value may not be accurate or precise. Typically used for organic compound values greater than the method detection limit but less than the contract required detection limit.
- B Estimated. The analyte was present, but the reported value may not be accurate or precise. Typically used for inorganic analyte concentra-

tions greater than the instrument detection limit but less than the contract required detection limit.

- R Rejected. Data was rejected by the data validator. The "R" flag indicates a significant variance in acceptable laboratory performance. Data flagged with an "R" may still be interpretable depending on the specific circumstances of the analysis and ultimate use of the data.

It is important to note that the data summary forms (included in Appendix D) also may have flags on them and the usage is the same as above with one major exception. Any organic compound that was detected in both the sample and the method blank was flagged with a B for possible laboratory contamination. However, during the data validation process all the target compounds flagged with a B were evaluated. For those compounds detected at a concentration less than 5 times the concentration (10 times the concentration for common laboratory contaminants) in any of the corresponding blanks (both laboratory and field blanks), the qualifying flag was changed to a U for undetected. The qualifying flag was removed from those compounds that were detected at a concentration greater than 5 times the concentration (10 times the concentration for common laboratory contaminants) in the environmental sample.

Once the data were reviewed and validated according to the guidance presented in NEESA 20.2-047B, the data were evaluated using the precision, accuracy, representativeness, comparability, and completeness (PARCCs) criteria included in the DQOs of the Sampling and Analysis Plan (SAP) or U.S. Navy (1991b).

3.4.3 Precision Precision is a measure of the agreement or repeatability of a set of replicate results obtained from duplicate analyses made under the same conditions. Precision was estimated from analytical data and cannot be measured directly. Precision was evaluated using field duplicate samples and laboratory split samples (for example, MS/MSD samples).

The criteria for evaluating precision presented in the SAP was 20 relative percent difference between duplicate results. Those duplicate analytical results that were not within 20 percent were flagged with an M for duplicate precision not met. This goal may not have been realistic for soil samples because of the heterogeneity of the sample matrix; all the soil duplicate results were within a more realistic acceptance window of -50 to +100 relative percent difference.

3.4.4 Accuracy Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. Accuracy also can be estimated from the analytical data, but was not measured directly. For the organic analyses, each of the samples was spiked with a surrogate compound; and for inorganic analyses, each sample was spiked with a known reference material before digestion. Each of these approaches provides a measure of the matrix effects on the analytical accuracy.

Target acceptance ranges for the spike recoveries are included in the analytical method. If the spike recovery fell outside the acceptance windows, then the sample data was qualified as indicated on the data summary tables.

3.4.5 Representativeness Representativeness is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition. Representativeness is a subjective parameter and is used to evaluate the efficacy of the sampling plan design. This criteria was satisfied for this project by fully describing in both the SAP and the RFI report, the sampling techniques and the rationale used for selecting sampling locations.

3.4.6 Comparability Comparability is a qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are: sample collection and handling techniques, sample matrix type, and analytical method. Comparability is limited by the other PARCC parameters because only when precision and accuracy are known can data sets be compared with confidence. Data from the two rounds of groundwater sampling can be compared directly because the sampling and analysis methods were specified in the SAP, and accuracy and precision data are available.

3.4.7 Completeness Completeness is defined as the percentage of measurements that are judged to be valid compared to the total number of measurements made. A goal of 95 percent usable data was established in the SAP. Less than 5 percent of the data were rejected during the data review and validation process; therefore, completeness is greater than 95 percent.

3.4.8 Variances in Analytical Performance Four target compounds specified for analysis in the Workplan were rejected by the data validator or were not reported by the laboratory. These compounds were 1,4-dioxane, diphenylamine, N-nitrosodiphenylamine, phenyl-tert-butylamine, and kepone.

The volatile organic compound, 1,4-dioxane, was reported as undetected by the laboratory for all Sample Delivery Groups (SDG). The data validator noted that the relative response factor (RRF) was less than 0.05 and rejected the data as non-compliant with CLP requirements. The RRFs for chloromethane, 1,1-dichloroethane, bromoform, 1,1,2,2-tetrachloroethane, and chlorobenzene were within specifications. This indicates that analytical performance of the method was in control. Therefore, under NEESA Level C guidelines, the results for 1,4-dioxane are acceptable for screening, and the laboratory results were accepted as reported.

All results were rejected during data validation for diphenylamine and phenyl-tert-butylamine because the laboratory did not calibrate the gas chromatograph/mass spectrometer (GC/MS) system for these compounds. Calibration of diphenylamine is not possible because the calibration mix contains another target compound, N-nitrosodiphenylamine. N-nitrosodiphenylamine thermally decomposes to form diphenylamine upon injection into the GC. These two compounds are therefore indistinguishable from each other. The sample results for N-nitrosodiphenylamine were all non-detects indicating that neither compound was present above the reported detection limits.

Phenyl-tert-butylamine was reported by the laboratory as not detected in all the samples. A library search of tentatively identified compounds for phenyl-tert-butylamine did not identify any positive sample results. This presumptive indication of the absence of phenyl-tert-butylamine will be confirmed in subsequent phases of the RFI.

Kepone was not reported by the laboratory. Although kepone is not believed to be a site contaminant, the Workplan did specify analysis of USEPA Method 8080 organo-chlorine pesticides, including kepone. At concentrations comparable to other target compounds, kepone does not chromatograph well (i.e., produces a broad peak that is difficult to detect or quantify). The laboratory noted the problem in their data package narratives. The laboratory determined that kepone can be analyzed by modifying the standard method by subjecting an aliquot of the extract to a sulfuric acid cleanup rather than a standard florisil or alumina cleanup. This separate portion of the extract is then analyzed for kepone only. The detection limit by this modified method should be approximately 1 microgram per liter ($\mu\text{g}/\ell$). Future analyses in subsequent phases of the RFI will specify this modification for analysis of kepone.

Laboratory performance was fair overall for inorganic analyses. Detections and non-detections of mercury were reported as estimated values for SDG 20740. The laboratory failed to run the proper MS/MSD for metals for this Sample Delivery Group. When the laboratory realized the error, they re-ran the metal analyses with the proper MS/MSD. With the exception of mercury, all holding times were within criteria.

3.4.9 Field and Laboratory Contamination This section presents an evaluation of data usability that focuses on specific samples with chemicals reported as detected and accepted during data validation, but were in fact, suspected to be due to laboratory or field sampling contamination. The suspect samples were compared with their specific laboratory and field QA/QC samples to determine whether the reported concentrations were due to sampling and analytical bias, or were site-derived contaminants. It was determined that all positive results for antimony, beryllium, cobalt, thallium, bis(2-ethylhexyl)phthalate, and methylene chloride were due to laboratory or field sampling contaminants.

Four metals (antimony, beryllium, cobalt, and thallium) were detected in many of the field samples at or near the instrument detection limit, but were not considered as contaminants of concern because:

- these metals were detected randomly in many of the samples at approximately the same concentration; i.e., there is no evidence of a source of contamination and a resulting migration plume;
- there is no evidence of historical use of these analytes at the site; and
- the results can be attributed to instrument noise rather than environmental contamination.

For metals analyses, an instrument detection limit (IDL) rather than a method detection limit is required by analytical method. This means that the standard solutions used in calculating the IDL are not carried through digestion as samples. The IDL as defined in USEPA 40 CFR Part 136, Appendix B, is a calculated rather than an experimentally measured value. The IDL is calculated as follows.

1. A standard solution (in reagent water) of the target analyte is prepared at a concentration 3 to 5 times the instrument manufacturer's suggested IDL.
2. The concentration of the standard solution is measured seven times sequentially with each measurement handled as a separate analytical sample.
3. This procedure is repeated on 3 non-consecutive days.
4. The standard deviation for the seven measurements is calculated for each day and then the average of the three standard deviations is determined.
5. The IDL is equal to three times the average standard deviation.

During the calibration procedure, a standard curve is prepared of instrument response as a function of calibration standards concentration. The lowest calibration concentration is typically 5 to 10 times the calculated IDL, or an instrument response of 3 to 5 times the instrument background noise. The laboratory is not required to demonstrate that a target analyte can be measured and reported at the IDL. For some target elements, sample results near the calculated IDL may not be distinguishable from instrument background noise. For example, the calculated IDL for thallium is 2.1 $\mu\text{g}/\ell$, which corresponds to an instrument response of 0.0085 absorbance units. The CLP contract required detection limit (CRDL) for thallium is 10 $\mu\text{g}/\ell$, which corresponds to an instrument response of 0.030 absorbance units, which is 3.5 times the instrument background noise. Therefore, values that fall at or near the calculated IDL may fall within instrument background noise and should be considered carefully by the data user.

The NEESA guidance allows that sample results that are greater than the IDL, but less than the CRDL are qualified with a B. This qualifier acts as a flag to remind the data user that the value may be uncertain because it may fall within instrument background noise. As part of the data review and interpretation process for each metal, the concentration of all the samples were compared to determine if samples with concentrations at or near the detection limit was due to instrument background noise or environmental presence.

Also, the NEESA guidance allows that if an inorganic target analyte is present in any blank (both field or laboratory) at a concentration greater than the IDL, but less than the CRDL, then any sample result less than 5 times the concentration in the corresponding blank may be qualified with a U as due to laboratory contamination or instrument noise. Likewise, for organic analyses, a sample result less than 5 times (10 times for common laboratory contaminants) the concentration in any related blank cannot be interpreted definitely as environmental contamination.

Antimony. Antimony was detected in water samples at concentrations from 10.2 J to 66.7 $\mu\text{g}/\ell$. The highest concentration of antimony was detected in surface water sample MPT-2-SW-5. As mentioned above, if a target analyte is present in any blank (both field or laboratory) at a concentration greater than the IDL but less than the CRDL, then any sample result less than 5 times the concentration in the corresponding blank may be qualified with a U as due to laboratory

contamination or instrument noise. The concentration of antimony at MPT-2-SW-5 was 66.7 $\mu\text{g}/\ell$, which is less than 5 times the value detected in any of the corresponding blanks. Summarized in the table below are the corresponding laboratory and field blank sample values.

Corresponding Blanks	Concentration ($\mu\text{g}/\ell$)
Preparation blank	40.0 U
Initial calibration blank	40.0 U
Continuing calibration blank	49.2 B
Equipment rinsate blank	50.4 B
MPT-2-SW-5	66.7

Antimony was detected in soil samples at concentrations from 2.5 J to 18.8 J milligrams per kilogram (mg/kg) (at MPT-2-SD-4). Before soil samples can be analyzed, an aliquot of the soil is digested with acid and the result aqueous digestate is analyzed. In order to compare water calibration blank results with corresponding soil sample results, the soil results must be multiplied by a factor of 5 to account for volume changes due to digestion. Using the example below, the soil sample results were 18.8 mg/kg; when multiplied by 5, the result is 94, which is less than 5 times the level detected in the corresponding calibration blanks. The concentration of antimony in the field and laboratory blank samples corresponding to the highest concentration of antimony in soil are summarized below.

Corresponding Soil Blanks	Concentration
Initial calibration blank	40.0 U $\mu\text{g}/\ell$
Continuing calibration blank	53.1 B $\mu\text{g}/\ell$
Equipment rinsate blank	47.7 B $\mu\text{g}/\ell$
MPT-2-SD-4	18.8 mg/kg

Therefore, the antimony detected in the water and soil samples can be attributed to instrument noise rather than environmental contamination because it was detected at a concentration less than 5 times the corresponding blank concentration.

Beryllium. Beryllium was detected in water samples at concentrations from 0.21 J to 1.60 J. The highest concentration of beryllium was detected in the groundwater sample from monitoring well MPT-13-MW4-1. The field and laboratory blank values corresponding to the highest beryllium concentration are summarized below.

Corresponding Blanks	Concentration ($\mu\text{g}/\ell$)
Preparation blank	0.189 U
Initial calibration blank	0.2 U
Continuing calibration blank	0.5 B
MPT-13-MW4-1	1.6 J

The concentration of beryllium in the sample is less than 5 times the concentration detected in the corresponding continuing calibration blank, and can be

attributed to instrument background noise rather than environmental contamination.

Beryllium was detected in the soil samples at concentrations from 0.05 J to 0.50 J mg/kg. The concentration of beryllium in the field and laboratory blank samples corresponding to the highest concentration of beryllium in soil are summarized below. Negative results are caused by instrument noise. The soil sample result was 0.50 mg/kg; when multiplied by 5, the result is 2.5, which is less than 5 times the level detected in the corresponding method blanks.

Corresponding Blanks	Concentration
Preparation blank	-0.048 B mg/kg
Initial calibration blank	-0.3 B $\mu\text{g}/\ell$
Continuing calibration blank	-0.2 B $\mu\text{g}/\ell$
MPT-22-L-1	0.50 $\mu\text{g}/\ell$

Therefore, the beryllium detected in the water and soil samples can be attributed to instrument background noise rather than environmental contamination because it was detected at a concentration less than 5 times the highest blank concentration.

Cobalt. Cobalt was detected in water samples at concentrations from 3.20 J to 9.70 J. The highest concentration of cobalt was detected in the surface water sample MPT-B-SW-3. The field and laboratory blank values corresponding to the highest cobalt concentration are summarized below.

Corresponding Blanks	Concentration ($\mu\text{g}/\ell$)
Preparation blank	2.312 B
Initial calibration blank	5.1 U
Continuing calibration blank	8.2 B
	7.4 B
Equipment rinsate blank	5.2 B
MPT-B-SW-3	9.7 B

Cobalt was detected in the soil samples at concentrations from 1.0 J to 11.3 J mg/kg. The soil sample results was 11.3 mg/kg; when multiplied by 5, the result is 56.5, which is less than 5 times the level detected in the corresponding method blanks.

Corresponding Blanks	Concentration
Preparation blank	2.312 B $\mu\text{g}/\ell$
Initial calibration blank	5.1 U $\mu\text{g}/\ell$
Continuing calibration blank	12.3 B $\mu\text{g}/\ell$
	7.7 B $\mu\text{g}/\ell$
MPT-2SD-6	11.3 B mg/kg

Therefore, the cobalt detected in the water and soil samples can be attributed to instrument noise rather than environmental contamination because it was detected in concentrations less than 5 times the highest blank concentration.

Thallium. Thallium was detected in water samples at concentrations from 1.0 J to 9.0 B. The highest concentration of thallium was detected in the groundwater sample from monitoring well MPT-2-MW7D-01. However, this sample was analyzed as a ten-fold dilution because of matrix interferences. Therefore, the concentration detected by the instrument without the dilution factor applied was 0.9 B. This concentration is at the instrument detection limit of 0.9 $\mu\text{g}/\ell$. Therefore, this concentration of thallium can be attributed to instrument noise and not environmental contamination.

Thallium was not detected in the soil samples. The data are qualified with a UJ instead of a U to indicate that the detection limit is estimated because of matrix interference as evidenced by poor spike recovery.

Bis(2-ethylhexyl)phthalate. Bis(2-ethylhexyl)phthalate is a common plasticizer. As mentioned above, a sample result less than 10 times the concentration in any related blank can be attributed to field or laboratory contamination. Bis(2-ethylhexyl)phthalate was detected in water samples at concentrations from 2 to 41 $\mu\text{g}/\ell$. The highest concentration was detected in the groundwater sample MPT-13-MW6-1 and the field and laboratory blank values corresponding to this sample result are summarized below.

Corresponding Blanks	Concentration ($\mu\text{g}/\ell$)
Method blank	10 U
Equipment rinsate blank	9 U
Field blank	3 U
MPT-13-MW6-1	41 U

Bis(2-ethylhexyl)phthalate was detected in the soil samples at concentrations from 45 to 260 J $\mu\text{g}/\text{kg}$. Before soil samples can be analyzed, an aliquot of the soil is extracted with an organic solvent and the resulting extract is analyzed. Therefore, corresponding water blank results must be multiplied by a factor of 33 to account for volume changes due to extraction before they can be compared to the soil sample results. The concentration of bis(2-ethylhexyl)phthalate in the field and laboratory blank samples corresponding to the highest concentration of bis(2-ethylhexyl)phthalate in soil are summarized below.

Corresponding Blanks	Concentration ($\mu\text{g}/\ell$)
Method blank	3 BJ
Equipment rinsate blank	10 U
Field blank	10 U
MPT-B-SD-3	260

Therefore, the bis(2-ethylhexyl)phthalate detected in the water and soil samples can be attributed to field sampling and laboratory contamination rather than environmental contamination because it was detected in concentrations less than 10 times the corresponding blank concentration.

Methylene chloride. Methylene chloride is used in the laboratory as an extraction solvent. As mentioned above, any sample less than 10 times the

concentration in any related blank can be attributed to contamination. Methylene chloride was detected in water samples at concentrations from 2 to 16 $\mu\text{g}/\ell$ (MPT-2-MW12D-1). The highest concentration was detected in the groundwater sample MPT-2-MW12D-1 and the corresponding field and laboratory blank values are summarized below.

Corresponding Blanks	Concentration ($\mu\text{g}/\ell$)
Method blank	5 U 2 BJ
Equipment rinsate blank	9 6
Trip blank	7
MPT-2-MW12D-1	16 B

Methylene chloride was detected in the soil samples at concentrations from 7 to 42 $\mu\text{g}/\text{kg}$. There is no multiplication factor for volatile soil results because the soil sample is not extracted; therefore, blank results can be directly compared to soil sample results. The highest concentration of methylene chloride was detected in MPT-13-6 and the corresponding field and laboratory blanks are summarized below.

Corresponding Blanks	Concentration ($\mu\text{g}/\ell$)
Method blank	5 B 7 B
Equipment rinsate blank	7 B
Field blank	3 BJ
Trip blank	4 BJ
MPT-13-6	42

Therefore, the methylene chloride detected in the water and soil samples can be attributed to field sampling and laboratory contamination rather than environmental contamination because it was detected in concentrations less than 10 times the corresponding blank concentration.

3.4.10 Summary Overall, the data are acceptable for use with the qualifications indicated with the flags.

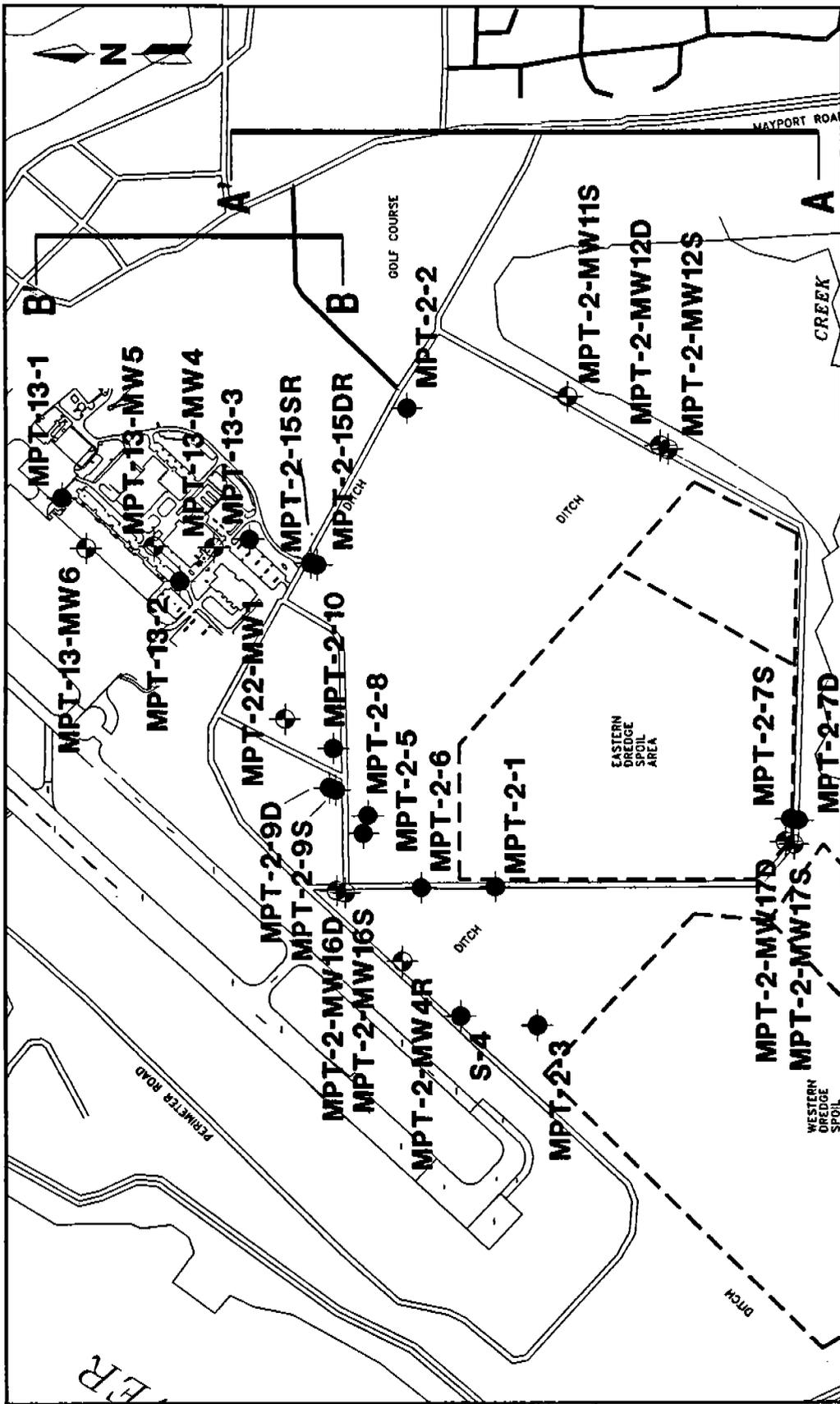
4.0 PHASE 1 RFI FINDINGS

This Chapter presents a discussion of findings addressing site characterization of the SWMUs in the Group I area. As previously discussed, the Phase 1 RFI field investigations address both facility-wide and SWMU-specific issues. Facility-wide characterization issues include: Group I assessment of geology, hydrology, ecological receptor identification, and background media chemical conditions. SWMU-specific investigations address sampling and analysis of suspected contaminated media and measurement of environmental properties affecting contaminant fate and transport.

4.1 GROUP I GEOLOGY. A total of 74 borings were drilled in the study area to define the geology and hydrology of the Miocene to Holocene age surficial deposits and aquifers. Geologic information generated by this process was used to construct geologic cross section traverses. Two view base lines of cross-section traverses are presented on Figure 4-1. Cross sections A-A' and B-B' are presented on Figures 4-2 and 4-3, respectively. These cross sections reveal three separate geologic units. The uppermost unit consists of a surficial deposit of material dredged from the Mayport Turning Basin and the St. Johns River. Beneath the surficial dredge material, a uniform, poorly graded, well sorted, sand (SP) with lenses of a very soft grey to dark-grey silty clay (CH, CM) are found. This sand unit, termed in the cross section undifferentiated post-Hawthorn deposits grades at depth into the third unit, the Coosawhatchie Formation of the Upper Hawthorn Group (Scott, 1988). These units are described in greater detail below.

Prior to construction of NAVSTA Mayport, it is likely that marshy areas were predominant in the interior area of the facility. Along the Atlantic Shore and the banks of the St. Johns River, beach and river bank sands would likely have predominated at the surface. Dredged material was used to fill low marshy interior areas during the initial construction and expansion of the facility. This developed areas with load bearing capacities suitable for construction in the marshy interior. The dredge material now comprises the surficial material found in the interior areas of the station. Due to varying sources, the dredge material varies in content across the facility but typically consists of fine-grained, well sorted sands and/or marine shell fragments. In several localities the coarse shell fragments are the dominant material and typically appear as shell (mollusk) hash lenses. Color ranges from tan to light grey. Where color change occurs the change is typically gradational over several feet. The fill thickness varies due to original topographic highs and lows and final elevation of the land. Fill likely ranges from 4 to 12 feet on most of NAVSTA Mayport.

Exceptions are two dredge spoil areas located in the Group I Area (Figure 3-1). These areas are basins constructed of dredged materials and are filled with dredge material to an elevation of approximately 25 feet above the surrounding terrain. The interior of the two dredge spoil basins appears to have developed a layer of hard pan, or multiple layers of hard pans that retard downward flow of either rain water or water that was entrained with dredge material during dredging events. Water contained within the basins slowly percolates through the basin sediments producing a hydrologic mounding effect centered near or within the basins.

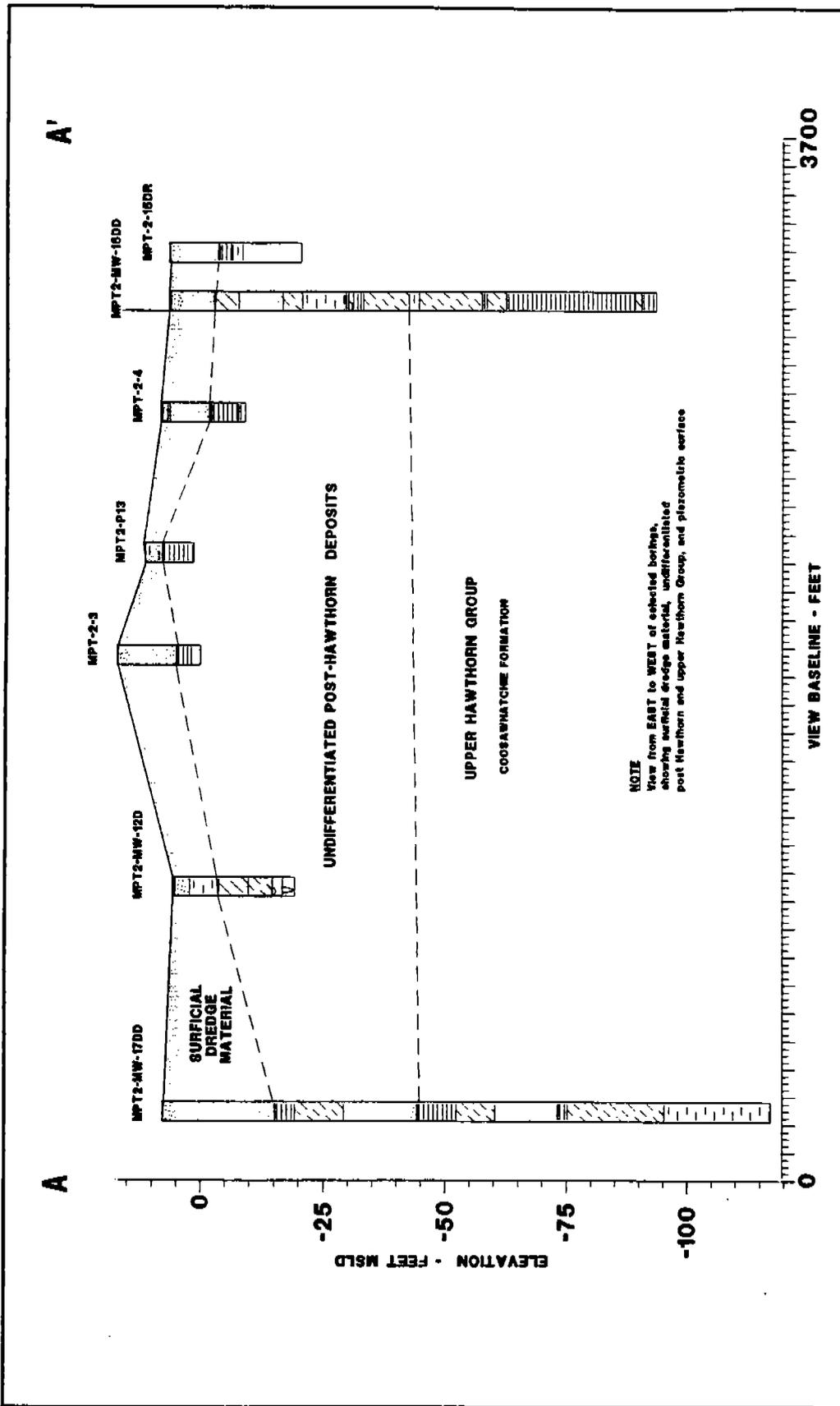


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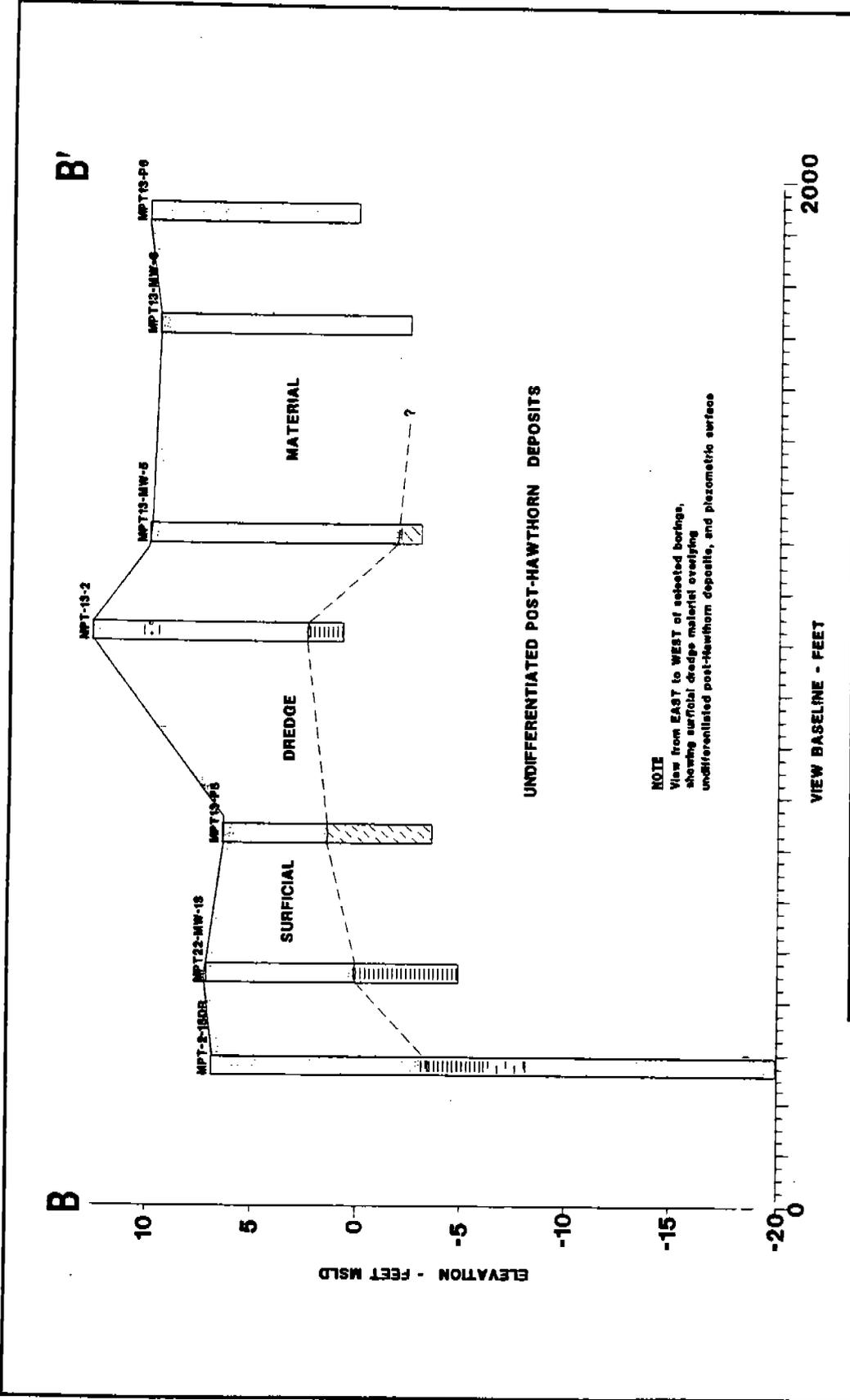
FIGURE 4-1
BASELINE FOR CROSS-SECTION
TRAVERSE A-A' AND B-B'



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FIGURE 4-2
CROSS SECTION A-A'
SWMU 2, 3, 4 AND 5
LANDFILLS B, D, E, F AND BUILDING
1600, BLASTING AREA



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**FIGURE 4-3
CROSS SECTION B-B'
SWMU 13
OLD FIRE TRAINING AREA**

The second unit, undifferentiated post-Hawthorn deposits (Scott, 1988), consists of fairly uniform, well sorted, poorly graded, very fine-grained sand (SP), which typically contains minor amounts of fines consisting of silts and clay and frequently has numerous shell fragments and subrounded pea-size gravel. The second unit is likely the product of Miocene to Holocene fluvial deposition and does not appear to be laterally uniform. River depositional processes have produced a highly variable set of lithologic units that are vertically anisotropic throughout the study area. Color ranges from tan to light grey. Where color change occurs the change is typically gradational over several feet.

The second unit frequently includes a very soft grey to dark-grey silty clay (CH, MH visual observation) layer 3 to 7 feet thick that likely represents recent estuarine deposition (silts, clays, and organics of marsh deposition). As mentioned above, the silty clay layer is typically restricted to the interior of the station and is not commonly found along the high energy zones of the beach or mouth and banks of the St. Johns River.

Two deep borings (MPT-2-MW16DD and MPT-2-MW17DD) were drilled in the Group I Area. Each of these borings encountered the surficial dredge material and the upper sand unit as described above. Below the upper sand unit a mixture of very fine- to fine-grained, tan-brown to gray sands (SP) with numerous shell fragments was encountered. Within these sands were lenses of clay that varied in thickness from inches to a maximum of several feet. This zone is interpreted to be the lateral equivalent of confining units typical of the Hawthorn Group located in Duval County (Leve, 1966). It is likely that these localized clay units form a leaky confining zone for the secondary aquifer.

Information provided by the two boring logs are not sufficient to determine exactly where the Upper Hawthorn Group (UHG) was encountered. Various factors such as lithologic description, and lithologic resistance to slit-spoon sampling indicate that the UHG was encountered in both borings somewhere between 40 and 55 feet bls. The UHG in these borings primarily consisted of fine- to medium-grained, tan to greenish-gray sand. These sands typically contained black phosphatic nodules and/or lithic limestone fragments. In addition, shell fragments similar to those found in the second unit were frequently encountered. Interbedded within the UHG sands were sandy clays typically gray or olive green in color. These sandy clays frequently exhibited zones rich in limestone fragments.

4.2 GROUP I HYDROGEOLOGY. The objectives of the hydrogeologic investigations conducted at Mayport NAVSTA during the Phase I RFI were fourfold: (1) to characterize the potentiometric surface of the surficial aquifer, (2) to estimate the hydraulic gradient and hydraulic conductivities, (3) to compute the linear pore velocity of the groundwater flow, and (4) to evaluate the extent and magnitude of tidal influence on the surficial aquifer.

4.2.1 Potentiometric Water Surfaces Water table elevations were measured on February 16, March 25, and April 20, 1992. Groundwater measurements were obtained from approximately 40 to 60 selected piezometers and monitoring wells. The measurements were typically achieved within a 4-hour period. Piezometers and monitoring wells were located in Group I, II, and III areas and consisted of all wells installed during this study, and wells installed previously that were advantageously positioned and accessible.

Average potentiometric surface elevations ranged from a low of 1.15 feet above msl at monitoring well MPT-9-3 located north of SWMUs 8, 9, and 10 within 50 feet of the St. Johns River, to a high of 9.26 above feet msl at the background monitoring well S-1 located south of SWMUs 8, 9, and 10.

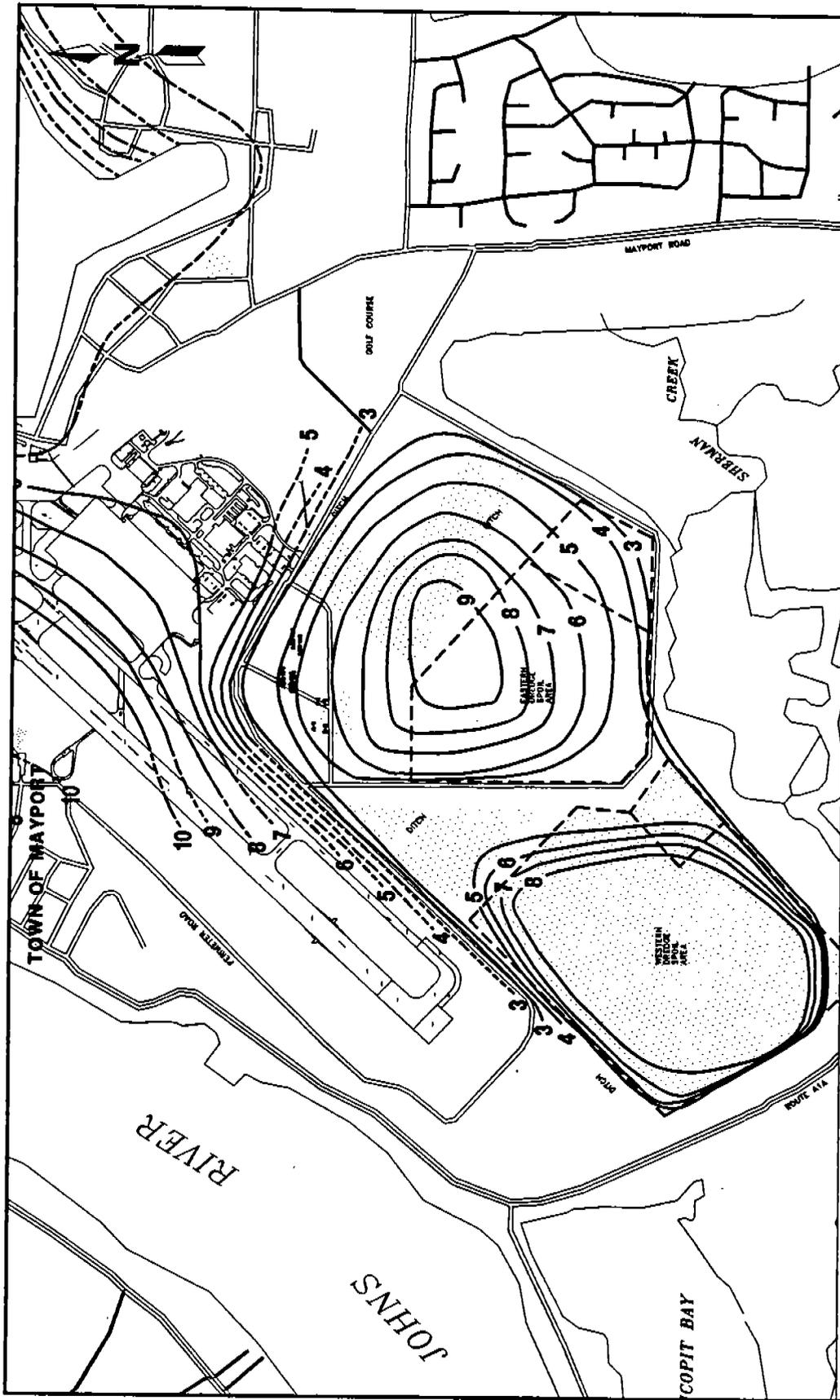
Surficial groundwater flow originates from three separate localized mounds (see Figure 4-4). Two of the mounds are located in Group I; one centered within the boundaries of the western dredge spoil areas, the other centered to the east of the eastern dredge spoil area. The third mound is generally oval in shape and is positioned along the main runway. This oval mound has two distinct lobes, one of which is oriented to the north toward the Fuel Farm Facility (SWMU 8, 9, and 10). The smaller second lobe is oriented to the south toward the Aircraft Intermediate Maintenance Facility (SWMU 13). Groundwater flow from each of these three mounds is radial. Flow from the mounded areas is initially to the numerous surficial discharge features that surround the facility to the south and west, then ultimately toward either the St. Johns River or the turning basin to the east.

Potentiometric maps were developed for each monthly survey event. Because each map was similar, an average potentiometric surface data map was developed for all three groundwater survey elevation events. This map is presented as Figure 4-4. The potentiometric surface may be subject to tidal variations as discussed below. Future water level data may also indicate seasonal variations in groundwater elevations at NAVSTA Mayport.

The regional potentiometric surface of the Floridan aquifer system is above ground surface at topographically low areas east of Jacksonville. Wells screened in the Floridan aquifer in the Mayport area are under sufficient artesian pressure to flow at the surface (Leve, 1966). Well clusters MPT-2-16S and 16DD and MPT-2-17S and 17DD were installed to investigate the degree to which this net upward flow of groundwater affects NAVSTA Mayport. MPT-2-16DD and 17DD are screened at 90 to 100 feet and 115 to 125 feet, respectively. The other wells are screened within 13 feet of the ground surface. Monitoring of water levels over a 4-month period shows that the potentiometric surfaces of the two screened intervals do not vary by more than a few tenths of a foot. The artesian influence is negligible with no net upward groundwater movement beneath the areas where the surficial aquifers potentiometric surface is higher than the potentiometric surface of deeper groundwater. This phenomena will be monitored during the year-long surficial groundwater potentiometric survey. Effects of seasonal rainfall variations on the surficial aquifer may alter the equilibrium.

4.2.2 Tidal Survey Fourteen wells were selected to conduct a survey of tidal effects on the surficial aquifer. Wells were selected based on proximity to tidally perturbed water bodies expected to influence the water table. These wells are located: (1) along the banks of the St. Johns River, (2) at tidally influenced creeks and drainage ditches located around the eastern dredge spoil areas, and (3) in areas distant from tidally affected surface water.

Five wells (MPT-9-P1, MPT-11-MW1, MPT-11-MW3, MPT-2-MW12S, and MPT-2-MW12D) were selected for hourly electronic monitoring whereas nine other wells (MPT-14-1, MPT-14-P-1, MPT-1-P1, MPT-1-P-3, MPT-1-1, MPT-17-P-2, MPT-2-15SR, MPT-2-15DR, and MPT-10-P-1) were selected for less frequent manual monitoring. MPT-9-P1, MPT-11-MW1, and MPT-11-MW3 represent a nearshore piezometer and two monitoring wells,



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FIGURE 4-4
WATER TABLE SURFACE MAP
DERIVED FROM DATA AVERAGED FROM
MONTHLY SURVEYS
FEBRUARY THROUGH APRIL 1992



respectively, located within 100 feet of the south bank of the St. Johns River. MPT-2-MW12S and MPT-2-MW12D are inland locations, approximately 5,000 feet from the nearest shoreline. The latter wells were selected in order to evaluate the influence of nearby tidal creeks (see Figures 3-1 and 3-2). Wells selected for manual measurements were typically located along the St. Johns River or inland from shoreline or drainage systems.

Tidal fluctuation tables produced by the U.S. Naval Observatory were obtained from the NAVSTA Mayport Harbor Pilots. These tables provided predicted tidal information for two staff gage locations over a 48-hour period.

Computer generated tidal data were compared with groundwater tidal fluctuation data obtained from the electronically monitored wells during the same time period. This time interval coincided with spring tides in the area. Therefore, tidal oscillations predicted by the U.S. Naval Observatory and recorded by onsite instruments represent the maximum tidal variations affecting the local water bodies during the measurement period.

Data presented in Figures 4-5, 4-6, 4-7, and 4-8 show the tidal response of the St. Johns River compared with monitoring wells where data on groundwater movement was electronically recorded. This data confirms the expected fluctuations in groundwater levels along tidally influenced water bodies.

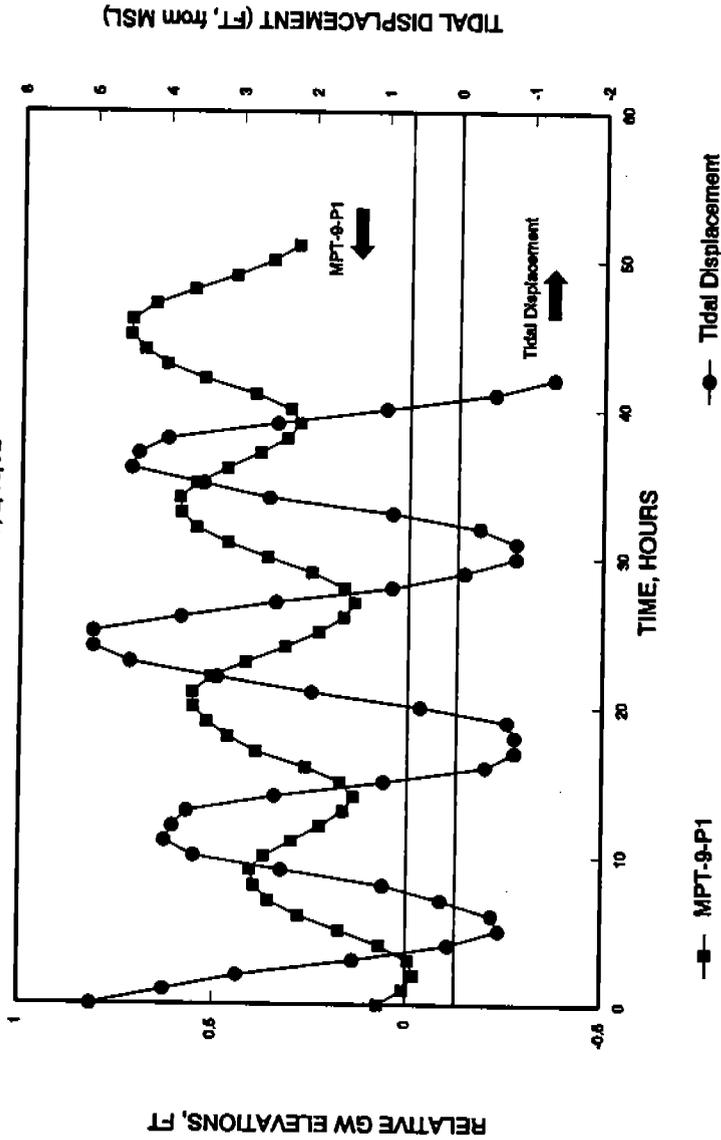
Each figure presents data obtained over a 48-hour period. Measurement times are presented along the horizontal axis of the figures. The tidal fluctuations relative to msl are presented on the vertical right axis. The relative groundwater response is presented on an exaggerated vertical left axis for one or more observation wells. The groundwater response was measured accurately but was referenced to an arbitrary datum that was not correlated to msl (elevations are minus a few tenths of a foot from msl). Two features common to all graphs are the response time lag, which varied from 7.5 to 11 hours, and the tendency to exhibit a net rise in water table elevation, possibly due to a waxing lunar cycle.

Tidal response measurement stations MPT-9-P1, MPT-11-MW1, and MPT-11-MW3 are located within 100 feet of the St. Johns River. These wells are screened (10 feet) in relatively clean permeable river sand. Groundwater response to tidal change is strong. Graphed monitoring well peak response is delayed approximately 9 hours relative to river tidal peaks. Graphed monitoring well troughs are delayed approximately 8 hours relative to graphed tidal body response. The graphed peaks correspond well to a rapidly incoming tide, whereas the graphed troughs correspond to a slowly receding tide.

The tide has an average linear variation of approximately 5 feet. Well response ranged from approximately 0.60 to 1.9 feet. Maximum tidal variation was 6.5 feet compared to groundwater maximum response, which ranged from 0.78 to 1.0 foot. Tidal response measurement stations MPT-2-MW12S and MPT-2-MW12D are located inland within 10 feet of a tidal creek, approximately 5,000 feet from the nearest river or ocean shoreline. MPT-2-MW12S is screened from 2 to 12 feet in organic rich, fine-grained sand and relatively impermeable organic rich clay. MPT-2-MW12D is screened from 14 to 24 feet in silty fine-grained sand with gravel lenses. Groundwater response in these wells to tidal change was relatively weak.

TIDAL STUDY DATA - GROUP II

START: 0600, 2/15/92



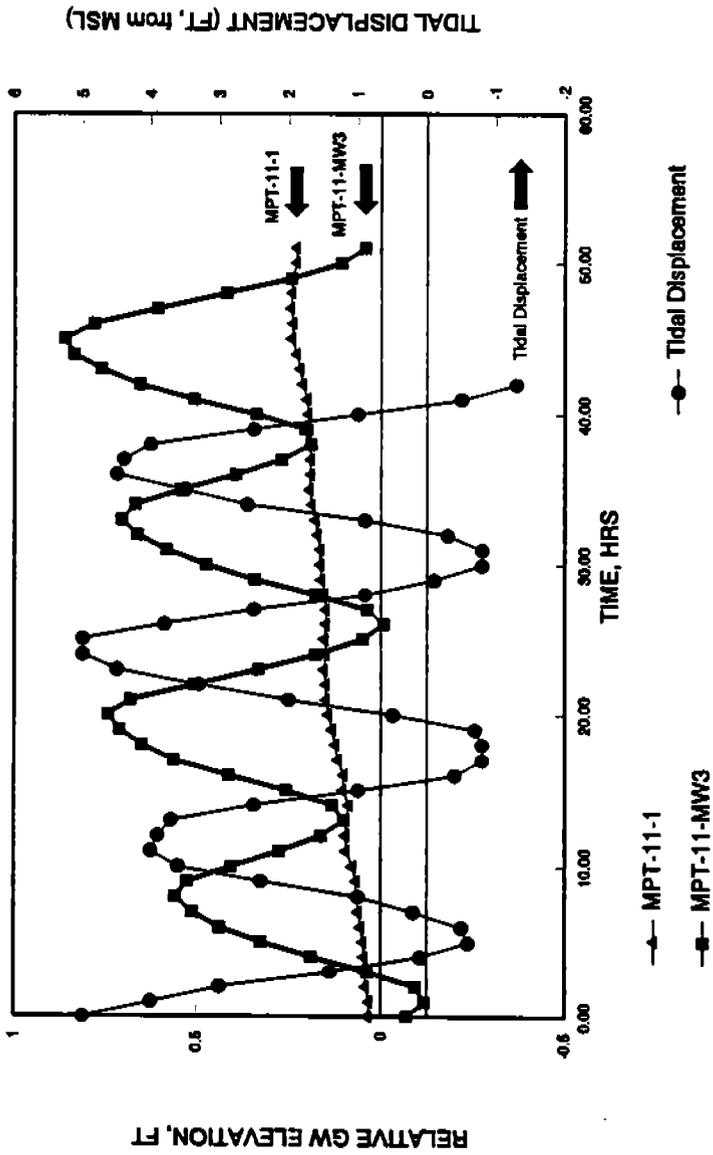
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FIGURE 4-5
TIDAL STUDY DATA FOR GROUP II
OILY WASTE TREATMENT PLANT,
SWMU 9
PIEZOMETER MPT-9-P1

TIDAL STUDY DATA - GROUP III

START: 0600 LCL, 2/15/92



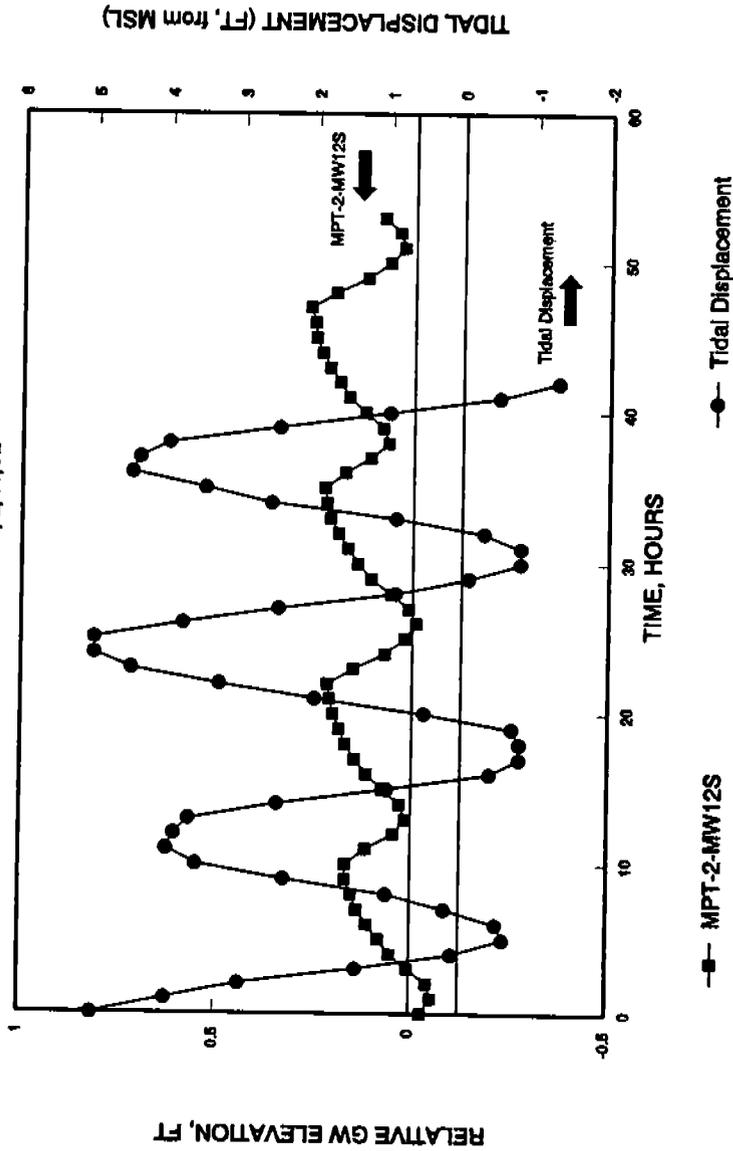
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FIGURE 4-6
TIDAL STUDY DATA FOR GROUP II
NEUTRALIZATION BASIN, SWMU 12
MONITORING WELLS MPT-11-1 AND
MPT-11-MW3

TIDAL STUDY DATA - GROUP I

START: 0600, 2/15/92

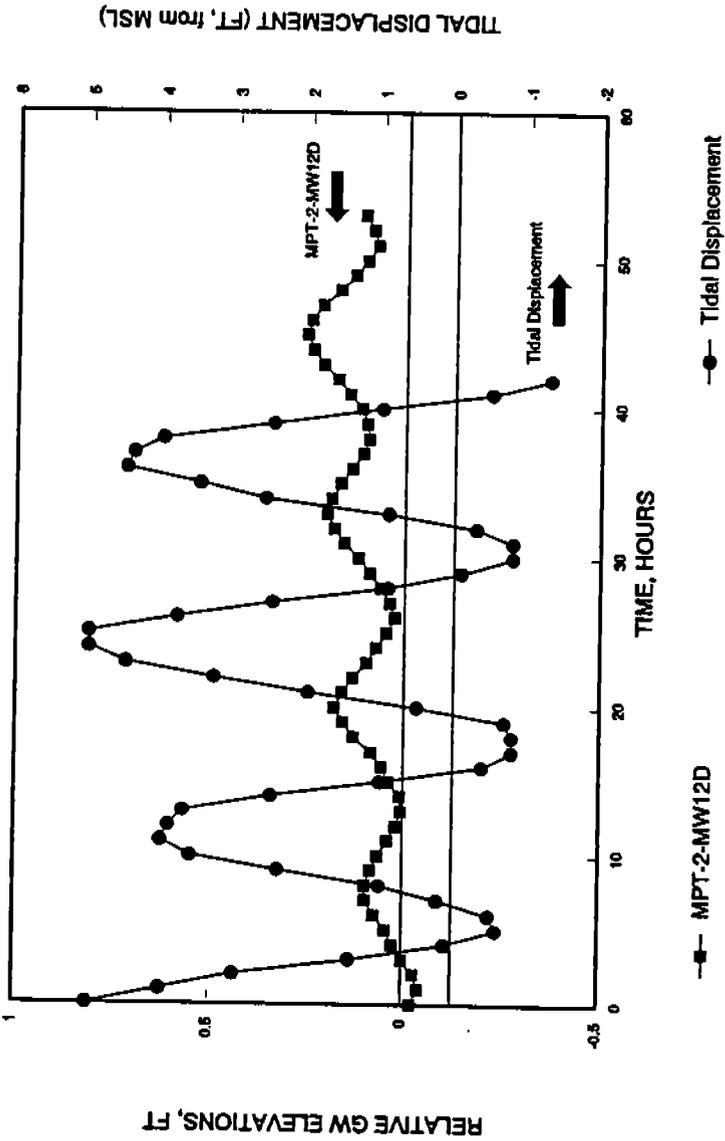


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FIGURE 4-7
TIDAL STUDY DATA FOR GROUP I
LANDFILL F, SWMU 5
MONITORING WELL MPT-2-MW12S

TIDAL STUDY DATA - GROUP I

START: 0600, 2/15/92



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FIGURE 4-8
TIDAL STUDY DATA FOR GROUP I
LANDFILL F, SWMU 5
MONITORING WELL MPT-2-MW12D

Peak response is delayed approximately 9 hours at MPT-2-MW-12D relative to river tidal peaks. Troughs are delayed approximately 8 hours. This corresponds well to a rapidly incoming tide and with the delayed response at wells near the St. Johns River. MPT-2-MW-12S responded slowly to tidal changes with a peak delayed approximately 11 hours. Wave form at MPT-2-MW-12S differed with an asymmetric pattern caused by a rapid drop with the outgoing tide. Trough response was comparable to other measured locations.

Well response to tide variation ranged from approximately 0.15 to 0.23 foot. Maximum tidal displacement was 6.5 feet compared to groundwater response, which ranged from 0.30 to 0.33 foot.

In summary, tidal influence is measurable in wells located close to tidally influenced waters such as the St. Johns River. Typically, groundwater response is delayed from 8 to 11 hours. Wells installed in areas that are not located near tidally influenced water bodies have a limited response.

Groundwater monitoring wells that were monitored manually were located away from tidally influence water bodies. Data collected from these wells indicated that minimal fluctuation occurs in groundwater levels at the interior of NAVSTA Mayport. Groundwater response in these wells was weak to non-existent. MPT-17-P-2 is located within 100 feet of the Turning Basin, but was not affected. This confirms that the Turning Basin retaining wall is relatively impermeable.

4.2.3 Slug Test Both rising- and falling-head slug tests were conducted on a network of piezometers and monitoring wells. Four to six trials were conducted at each location in order to provide a statistical average of the estimated hydraulic conductivities (K) of the aquifer in the vicinity of the screened intervals. From the multiple trials, the precision of the K data was also evaluated. These data are presented in Table 4-1.

Piezometers and wells were screened down to a depth of 25 feet bls using 5- and 10-foot screens. The majority of the piezometers were installed at shallow depths, not exceeding 15 feet bls.

Hydraulic conductivities ranged from 1.3 to 72.2 feet per day (ft/d) with an overall average of 20.1 ft/d. The hydraulic conductivity estimates represent the local variation of this parameter within the fine-grained, silt-shell-clay admixture that constitutes the upper units of the surficial aquifer at Mayport NAVSTA. Average conductivity estimates were within the same order of magnitude at each SWMU site except at SWMU 17, where an order of magnitude difference existed between the neighboring piezometers. Hence, one can consider the upper 20 feet of the surficial aquifer to be relatively homogeneous. Relatively higher hydraulic conductivity values are noted for SWMUs 1 and 14 near the south jetty shore (Figure 2-2). The single data point at SWMUs 8, 9, and 10 was one of the highest K values measured at the facility. The lowest conductivities were observed at SWMUs 2 and 5 except for the intermediate monitoring well (MPT-2-MW12D), which was screened within a shell bed. Hydraulic conductivity was also low at the southern margins of the two dredge spoil areas at the southwestern border of the facility.

4.2.4 Groundwater Flow Velocity The average water velocity (V) as calculated by Darcy's law and assuming a porosity of 0.35, ranges from 0.0502 to 0.7133 ft/d

**Table 4-1
In-Situ Hydraulic Conductivities (K) at
Groups I, II, and III**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU	Well/Piezometer	Runs	Range of K (feet/day)	Median K (feet/day)	Average K (feet/day)	Screen Interval (feet bis)
1	MPT1-P1	5	14.918 - 236.304	17.597	46.022 ¹	5 - 10
1	MPT1-P2	5	21.298 - 27.547	24.509	24.477	10 - 15
1	MPT1-P3	6	15.178 - 19.080	16.538	16.599	10 - 15
2	MPT2-P5	6	5.049 - 5.985	5.507	5.507	5 - 11
4	MPT2-P2	4	7.425 - 8.361	7.963	7.929	5 - 10
4	MPT2-P4	5	11.698 - 16.992	12.348	13.137	30 - 35
4	MPT2-P9	5	15.826 - 19.152	18.216	18.009	30 - 35
4	MPT2-P11	6	6.393 - 9.092	7.429	7.647	30 - 35
5	MPT2-P6	6	5.897 - 6.419	6.175	6.159	5 - 10
5	MPT2-P8	6	3.976 - 5.995	4.589	4.471	5 - 10
5	MPT2-MW-15DR	6	9.831 - 14.043	13.078	12.454	15 - 25
5	MPT2-MW-12D	5	36.187 - 50.558	46.022	44.769	20 - 25
9	MPT9-P1	5	19.498 - 31.752	29.995	30.521	12 - 17
13	MPT13-P1	6	15.019 - 21.888	18.115	18.288	5 - 10
13	MPT13-P4	4	3.537 - 17.078	15.077	15.739	5 - 10
13	MPT13-P5	5	1.318 - 1.387	1.331	1.347	5 - 10
14	MPT14-P1	4	10.918 - 13.500	11.52	11.864	5 - 10
14	MPT14-P2	4	17.554 - 28.123	21.254	22.046	6 - 11
17	MPT17-P1	4	62.165 - 82.037	72.302	72.202	5 - 10
17	MPT17-P2	6	17.697 - 26.712	23.558	22.856	7 - 12

¹Geometric mean, all others are arithmetic means.

Note: Runs are slug-test data retrieval events.
bis = below land surface.

over a depth interval of 5 to 20 feet bls. Groundwater in interconnected pore spaces of the surficial aquifer will move 18 to 260 feet a year. Typically, areas experiencing higher groundwater flow rates were along nearshore areas where beach sands predominate and the relatively impermeable silty clay unit is not found. A possible exception is the dredge spoil areas where local mounding of groundwater has produced relatively steep hydraulic gradients along the perimeter.

4.2.5 Physical Characteristics of Soil Ten soil samples (with one duplicate) were also submitted to the laboratory for sieve analysis (grain-size diameter) and determination of uniformity coefficient. Results of these analyses were used to classify the soils relative to engineering grades using an approved ASTM grain-size distribution chart (Table 4-2). Other soil characteristics measured during Phase 1 are presented in Table 4-3.

Grain-size distribution curves showed that all samples consisted mainly of poorly graded, fine-grained sand size material. Samples MPT-2-11S, MPT-2-16S, and MPT-13-5 consist of 85 to 90 percent fine-grained sand. Samples MPT-2-12S, MPT-2-15S, and MPT-13-6 are primarily (95 percent) medium-grained sand with less than 5 percent smaller than fine-grained sand size. MPT-13-4 and its duplicate consist of 80 percent fine-grained sand and 20 percent medium-grained sand.

The two unusual samples are MPT-2-17S and MPT-22-1S. MPT-2-17S consists of 65 percent fine-grained sand and 35 percent medium-grained sand. MPT-22-1S contains 50 percent fine-grained sand size material, 25 percent medium-grained sand, and 25 percent coarse sand. These samples are generally classed as SP soils (USCS), consisting predominantly of one grain size, fine, and a low percentage of fines typically comprising the remainder.

Based on the observed particle size distributions, an estimated porosity range of 0.25 to 0.35 appears reasonable (assumed 0.35). The organic content and ion exchange capacity of the soils are relatively low (see Table 4-3). This implies that retardation of contaminants in groundwater flow will be small and, therefore, contaminants will travel at the same velocity as the groundwater.

4.3 BACKGROUND SAMPLE RESULTS. Table 4-4 summarizes the samples and analyses collected for background characterization of surface water, sediments, and groundwater. Figure 4-9 presents the background sample locations and detected chemicals. As discussed earlier, groundwater flow characteristics in the Group I Area are affected by mounding by the dredge spoil areas and tidally influenced surface water drainage features. Migration pathways via groundwater and surface water are interrelated between individual SWMUs due to these factors. Distinguishing background conditions on a SWMU-specific basis is not feasible because of these close interrelations. Therefore, characterization during the Phase 1 RFI established facility-wide background conditions by sampling media unaffected by SWMU operations in the local area of NAVSTA Mayport (Figure 4-9). Subsequent phases of the RFI will sample additional media in unaffected areas in order to refine background conditions and variability on a facility-wide basis.

4.3.1 Surface Water Surface water around Mayport south of the St. Johns River is classified as Class III Waters for Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife (Chapter 17-302.560,

**Table 4-2
Soil Sample Uniformity Coefficients**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Location	Percent Sand			Uniformity Coefficient, Cu ¹
	F	M	C	
MPT-2-12S	95			1.9
MPT-2-15S	95			1.5
MPT-13-4	80	20		1.6
MPT-13-4 Duplicate	80	20		1.9
MPT-13-5	85	15		2.2
MPT-13-6	95			1.6
MPT-2-11S	90			2.0
MPT-2-16S	85	15		1.9
MPT-2-17S	65	35		3.9
MPT-22-1S	50	25	25	4.8

¹ Cu = D₆₀/D₁₀
 Cu < 4 = well sorted, poorly graded.
 Cu > 6 = poorly sorted, well graded.

Notes: F = fine.
 M = medium.
 C = coarse.

Table 4-3 Physical Soil Characteristics									
Phase 1 RCRA Facility Investigation NAVSTA Mayport Mayport, Florida									
Location	MPT-2-MW111-1	MPT-2-MW12S-1	MPT-2-MW16S-1	MPT-2-MW17S-1	MPT-13-MW4-1	MPT-13-MW5-1	MPT-13-MW6-1	MPT-22-MW1-1	
Analyte									
Percent moisture	15.1	18.5	17.9	7.9	15	15.4	14.9	15.7	
Soil bulk density	1.39	1.38	1.44	1.45	1.41	1.39	1.28	1.57	
Cation exchange capacity	5	2.1	1.4	1.9	1.8	1.1	0.7	2.1	
pH	7.57	7.91	9.24	8.42	8.19	8.6	9.11	8.44	
TOC	2,800	1,140	3,480	3,780	2,470	1,320	1,870	6,650	
Notes: Soil bulk density = grams/cubic centimeter. Cation exchange capacity = milliequivalents per 100 grams. pH = standard units. TOC = total organic carbon in milligrams per liter.									

**Table 4-4
Summary of Background Chemical Analyses**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Source	Media	U.S. Environmental Protection Agency SW-846 ¹							Totals
		Method 8240 VOC	Method 601 VOC	Method 8270 SVOC	Method 6010, 7470, 7480 Metals	Method 8080 Pest/PCB	General Parameters (soil)	General Water Quality	
Background	Sediment ²	4	0	4	4	4	0	0	16
	Groundwater ²	2	1	2	2	2	0	2	10
	Surface water ²	4	0	4	4	4	0	4	20

¹ Selected Appendix IX Groundwater Monitoring List Compounds as analyzed by method indicated.

² Includes field duplicate samples.

Notes: VOC = volatile organic compounds.

SVOC = semivolatile organic compounds.

Pest/PCB = organochlorine pesticides and polychlorinated biphenyls.

Figure 4-9 Background Sample Results for Surface Water, Sediment, and Monitoring Wells

FAC). Bar-chart summaries of all measured surface water quality parameters for each sample are presented in Figures 4-10 through 4-12.

Total Dissolved Solids (TDS), as measured by a gravimetric method (USEPA Method 160.1), ranged from 8,700 mg/l in a sample from MPT-B-SW-1 to 15,600 mg/l in a sample from MPT-B-SW-2. The TDS is biased low for some of these samples if compared to an ion balance. Background surface water is moderately saline and general water quality is influenced by the estuarine character of Sherman Creek, Pablo Creek, and Chicopit Bay.

Sulfate and chloride were the dominant anions. Sulfate (SO_4^{2-}), a common form of sulfur found in oxygenated conditions, ranged from 686 mg/l in MPT-B-SW-1 to 1,190 mg/l in a sample from MPT-B-SW-1. Sulfide (S^{2-}) is a form of reduced sulfur often found under anaerobic conditions. No sulfide was found in any background sample above the method detection limit (<0.1 mg/l). Chloride ranged from 9,130 mg/l in a sample from MPT-B-SW-1 to 10,400 mg/l in a sample from MPT-B-SW-2. Background surface waters meet the conditions for predominantly marine water as defined in Chapter 17-302.200, FAC (chloride $\geq 1,500$ mg/l).

Alkalinity (as calcium carbonate [CaCO_3]) ranged from 112 mg/l in sample MPT-B-SW-3 to 204 mg/l in sample MPT-B-SW-1. Hardness (as CaCO_3) ranged from 404 mg/l in MPT-B-SW-2 to 1,640 mg/l in MPT-B-SW-1, which is in the "hard" range for natural waters.

Surface water nutrient compounds measured during Phase 1 field activities included nitrogen and phosphorous. Nitrogen species included ammonia (total), TKN, and total nitrites and nitrates. Ammonia was analyzed using USEPA Method 350.2, which reports both un-ionized ammonia and ammonium ion. TKN was measured using USEPA Method 351.3. Nitrite and nitrate nitrogen were measured by USEPA Method 353.2.

Because all nitrogen forms were not detected at all locations, total nitrogen was estimated as the sum of TKN and nitrite and nitrate and used as a basis for comparison between sample locations. Typical total nitrogen concentrations ranged from 1.02 mg/l (MPT-B-SW-3) to 1.63 mg/l (MPT-B-SW-1). Ammonia was not detected in any of the background samples.

Phosphorus was measured by USEPA Method 365.1, which determines total phosphorus including elemental phosphorus, orthophosphorus, and hydrolyzable (organic) phosphorus. Total phosphorus ranged from 0.28 mg/l in a sample from MPT-B-SW-3 to 1.03 mg/l in a sample from MPT-B-SW-2.

TOC was measured by USEPA Method 415.2 as an estimate of the carbonaceous oxygen demand in the surface water. Values ranged from 12 mg/l (MPT-B-SW-3) to 15 mg/l (MPT-B-SW-1). As a proxy for the more common measure of biological degradable carbonaceous matter in water, 5-day biochemical oxygen demand (BOD_5), TOC is generally an order of magnitude greater than the corresponding BOD_5 value.

Oil and grease concentrations was measured by USEPA Method 413.1, which is an infrared spectrophotometric technique that measures hydrocarbons, vegetable oil, animal fats, waxes, greases, and other related matter. It is a broad measure of hydrocarbons in water. Oil and grease concentrations ranged from 0.5 mg/l in a sample from MPT-B-SW-1 to 3.8 mg/l in a sample from MPT-B-SW-2.

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Surface Water Sample Location MPT-B-SW-1

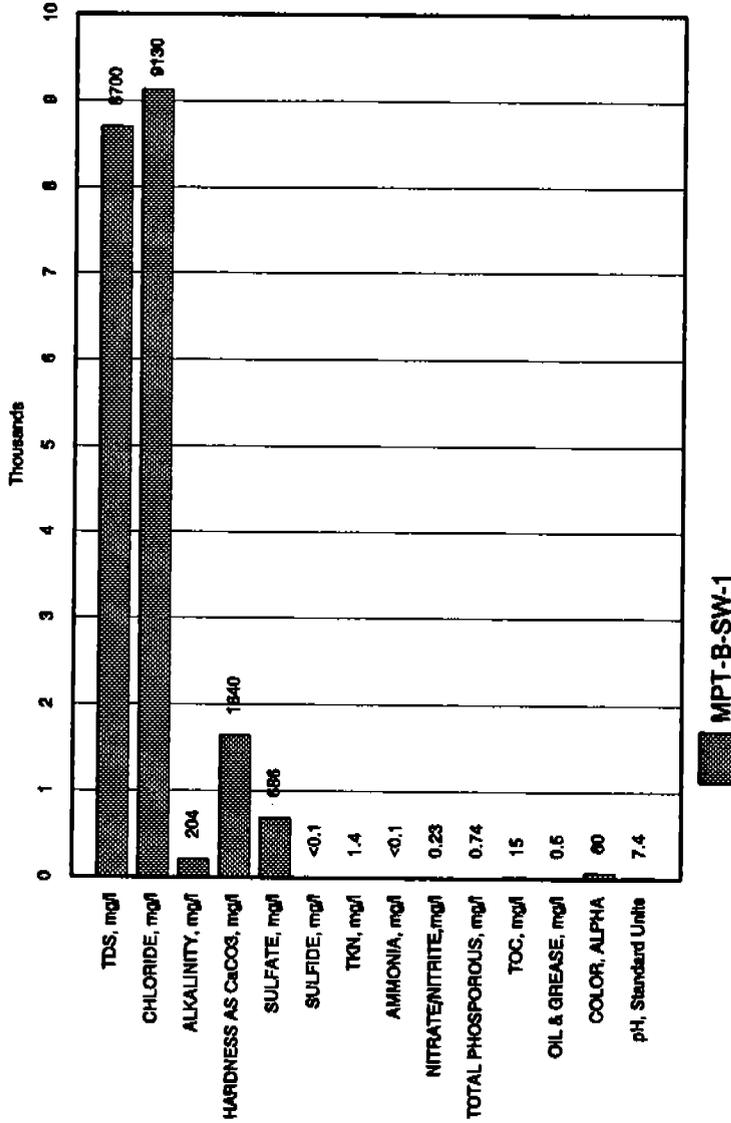


FIGURE 4-10
GENERAL SURFACE WATER QUALITY AT
SAMPLE LOCATION MPT-B-SW-1
(BACKGROUND SAMPLE)



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Surface Water Sample Location MPT-B-SW-2

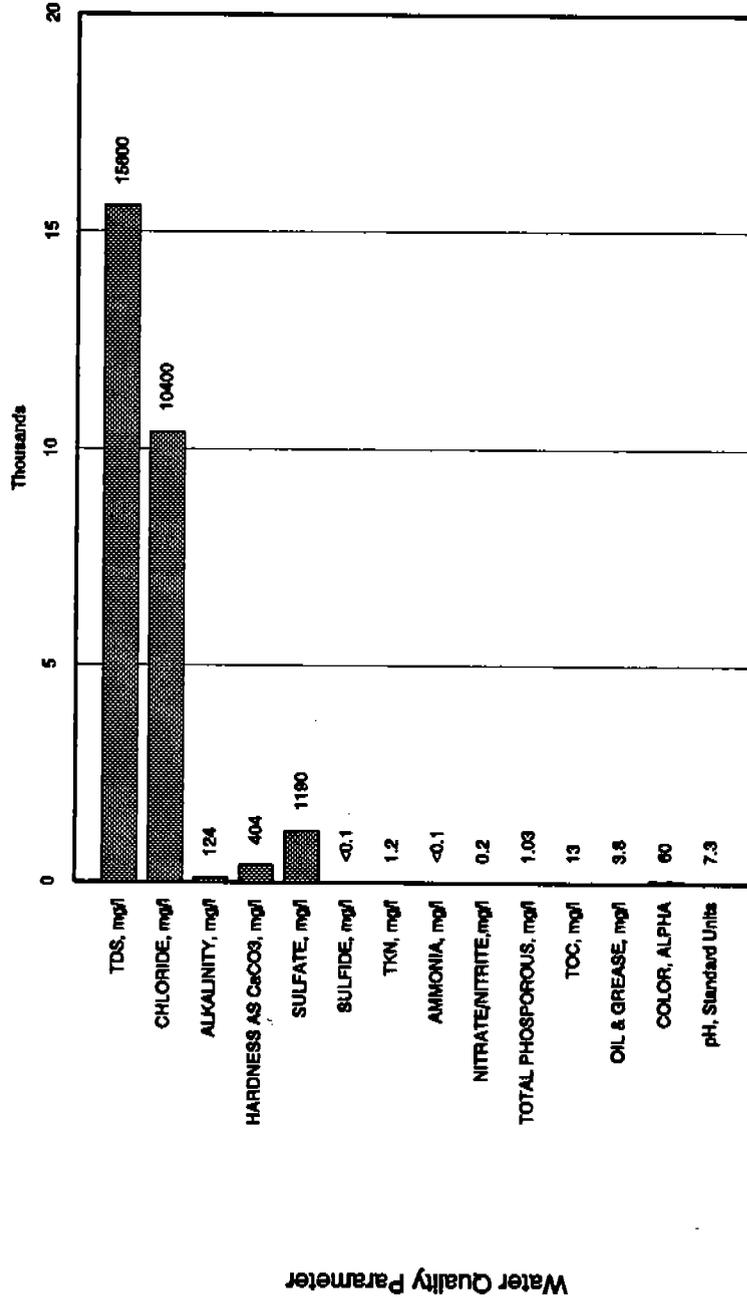


FIGURE 4-11
GENERAL SURFACE WATER QUALITY AT
SAMPLE LOCATION MPT-B-SW-2
(BACKGROUND SAMPLE)



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Surface Water Sample Location MPT-B-SW-3

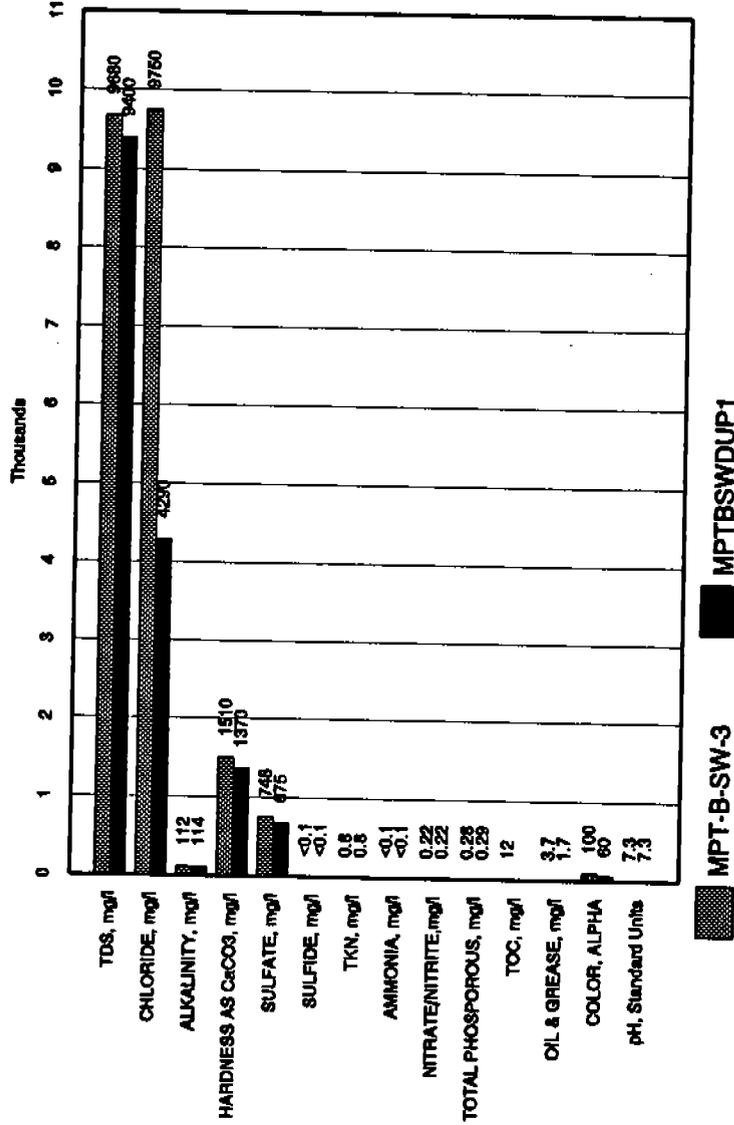


FIGURE 4-12
GENERAL SURFACE WATER QUALITY AT
SAMPLE LOCATIONS MPT-B-SW-3 AND
MPT-B-SW-DUP1 (BACKGROUND SAMPLE
AND DUPLICATE SAMPLE)



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Color as measured by USEPA Method 110.2 ranged from 60 American Public Health Association (APHA) units in samples from MPT-B-SW-1 and MPT-B-SW-2 to 100 APHA units in a sample from MPT-B-SW-3. The laboratory-measured pH ranged from 7.3 to 7.4 standard units.

General parameters such as TDS, alkalinity, and hardness indicate that the surface water at background surface water locations is affected by the estuarine influences of Sherman Creek, Pablo Creek, and Chicopit Bay. Water quality at the time of sampling was within Class III criteria for the general parameters measured that had standards (Chapter 17-320.530, FAC.)

Table 4-5 presents the chemicals detected in the background surface water samples. No VOCs, SVOCs, pesticides, or PCBs were detected in any background surface water samples. Samples for inorganic constituents were collected without filtration and were preserved immediately after collection with acid. The metal results are total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions. The following inorganic elements and compounds were measured in the background surface water samples.

- Estimated concentrations of arsenic ranged from 0.86 $\mu\text{g}/\ell$ in sample MPT-B-SW-2 to 1.4 $\mu\text{g}/\ell$ in sample MPTBSWDUP1 (duplicate sample of MPT-B-SW-3).
- Estimated concentrations of barium ranged from 11.1 $\mu\text{g}/\ell$ in sample MPT-B-SW-1 to 15.4 $\mu\text{g}/\ell$ in sample MPT-B-SW-3.
- Cadmium was estimated in sample MPTBSWDUP1 at 2.4 $\mu\text{g}/\ell$. Cadmium was not reported in its duplicate sample MPT-B-SW-3.
- Chromium was estimated in sample MPTBSWDUP1 at 4 $\mu\text{g}/\ell$. Chromium was not reported in its duplicate sample MPT-B-SW-3.
- Copper ranged from an estimated concentration of 2.4 $\mu\text{g}/\ell$ in sample MPT-B-SW-3 to 37.2 $\mu\text{g}/\ell$ in sample MPT-B-SW-2.
- Estimated lead concentrations ranged from 1.3 $\mu\text{g}/\ell$ in sample MPT-B-SW-1 to 1.5 $\mu\text{g}/\ell$ in MPTBSWDUP1 (duplicate sample of MPT-B-SW-3).
- Estimated selenium concentrations ranged from 1.8 $\mu\text{g}/\ell$ in sample MPT-B-SW-3 to 2.6 $\mu\text{g}/\ell$ in sample MPT-B-SW-1.
- Vanadium was estimated in sample MPT-B-SW-1 at 3.6 $\mu\text{g}/\ell$.
- Cyanide was estimated in sample MPT-B-SW-1 at 3 $\mu\text{g}/\ell$.

4.3.2 Sediments Table 4-6 summarizes the detected chemicals in the background sediment samples. Carbon disulfide, a common byproduct of anaerobic decomposition of organic material, was found in sediment sample MPT-B-SD-3 and its duplicate, MPTBSDDUP1, at 83 and 19 micrograms per kilogram ($\mu\text{g}/\text{kg}$), respectively. Toluene was estimated at 3 $\mu\text{g}/\text{kg}$ in sample MPT-B-SD-3. Di-n-butyl phthalate was found in sediment samples MPT-B-SD-2, MPT-B-SD-3, and MPTBSDDUP1 at estimated concentrations of 54, 70, and 71 $\mu\text{g}/\text{kg}$, respectively. No other VOCs were detected in the background sediment samples.

**Table 4-5
Detected Inorganic Chemicals in Background Surface Water Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20723		20723		20723		20723	
Sample Matrix:			Water		Water		Water		Water	
Location/Sample No.:			MPT-B-SW-1		MPT-B-SW-2		MPT-B-SW-3		MPTBSWDUP1	
Date Sampled:			01/21/92		01/21/92		01/21/92		01/21/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
7440-38-2	Arsenic	$\mu\text{g}/\ell$	1.2	J	0.86	J	1.2	J	1.4	J
7440-39-3	Barium	$\mu\text{g}/\ell$	11.1	J	12.3	J	15.4	J	15.4	J
7440-43-9	Cadmium	$\mu\text{g}/\ell$							2.4	J
7440-47-3	Chromium	$\mu\text{g}/\ell$							4	J
7440-50-8	Copper	$\mu\text{g}/\ell$			37.2		2.4	J		
7440-92-1	Lead	$\mu\text{g}/\ell$	1.3	J			0.91	J	1.5	J
7440-49-2	Selenium	$\mu\text{g}/\ell$	2.6	J			1.8	J		
7440-62-2	Vanadium	$\mu\text{g}/\ell$	3.6	J						
5955-70-0	Cyanide	$\mu\text{g}/\ell$	3	J						

Notes: Laboratory data validated with NEESA Level C criteria.
 Conc. = concentration.
 Qual. = qualifier.
 $\mu\text{g}/\ell$ = micrograms per liter.
 "J" = estimated value.

**Table 4-6
Detected Organic and Inorganic Chemicals in Background Sediment Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20723		20723		20723		20723	
Sample Matrix:			Sediment		Sediment		Sediment		Sediment	
Location/Sample No.:			MPT-B-SD-1		MPT-B-SD-2		MPT-B-SD-3		MPTBSDUP1	
Date Sampled:			01/21/92		01/21/92		01/21/92		01/21/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
75-15-0	Carbon disulfide	µg/kg					83		19	
108-88-3	Toluene	µg/kg			3	J				
84-74-2	Di-n-butyl phthalate	µg/kg			54	J	70	J	71	J
72-55-9	4,4'-DDE	µg/kg	3							
72-54-8	4,4'-DDD	µg/kg	0.8	J						
7440-38-2	Arsenic	mg/kg	0.68	J			4.2	J	6.6	
7440-39-3	Barium	mg/kg	3.6	J	7.4	J	16.1	J	15.2	J
7440-43-9	Cadmium	mg/kg					0.82	J		
7440-47-3	Chromium	mg/kg	2.5	J	4.4		28.1		26.6	
7440-50-8	Copper	mg/kg	2	J	2.3	J	3.1	J	3.5	J
7440-92-1	Lead	mg/kg	3.4		3		8.5		10	
7440-02-0	Nickel	mg/kg			5.5	J	7.1	J	6.4	J
7440-49-2	Selenium	mg/kg	0.39	J	0.32	J	0.52	J	0.62	J
7440-62-2	Vanadium	mg/kg	2.2	J	3.7	J	28.4		26.2	
7440-66-6	Zinc	mg/kg	7.7		6.1		26.7		32.1	

Notes: Laboratory data validated with NEESA Level C criteria.
CAS RN = chemical abstract service registry number.
Conc. = concentration.
Qual. = qualifier.
µg/kg = micrograms per kilogram.
"J" = estimated value.
mg/kg = milligrams per kilogram.

No SVOCs were detected in any of the background sediment samples. A congener of DDT, 4,4'-DDE, was detected in sample MPT-B-SD-1 at 3 $\mu\text{g}/\text{kg}$. Another congener of DDT, 4,4'-DDD, was detected in sample MPT-B-SD-1 at an estimated concentration of 0.8 $\mu\text{g}/\text{kg}$. Various metals were found in the sediment samples. MPT-B-SD-3 and its duplicate had the highest metal concentrations and frequency of detections.

4.3.3 Groundwater Groundwater samples were collected from two existing monitoring wells located upgradient from any known SWMUs. MPT-1-1 is located in the Group III area up gradient from SWMU 1. S-1 is located in the Group II area upgradient from SWMU 8. A public water well intended to be sampled was reportedly located south of the Group I area. However, this well was not found.

MPT-1-1 and S-1 had been installed in the shallow portion of the surficial aquifer during earlier investigations NAVSTA Mayport. Groundwater in the unconfined surficial aquifer at Mayport is classified Class G-II as defined by Chapter 17-3.403, FAC. Class G-II groundwater is potable-use groundwater in aquifers that have TDS contents of less than 10,000 mg/ℓ , unless otherwise classified. G-II groundwater should meet primary and secondary drinking water quality standards as listed in Chapters 17-550.310 and 550.320, FAC. TDS, as measured by a gravimetric method (USEPA Method 160.1), was 213 mg/ℓ in a sample from MPT-1-MW1-1 and 405 mg/ℓ in sample from MPT-S-1-1. Figures 4-13 and 4-14 present bar chart summaries of general groundwater quality. Table 4-7 presents the concentrations of significant general water quality parameters measured in background groundwater samples.

**Table 4-7
General Water Quality for Background Groundwater Samples**

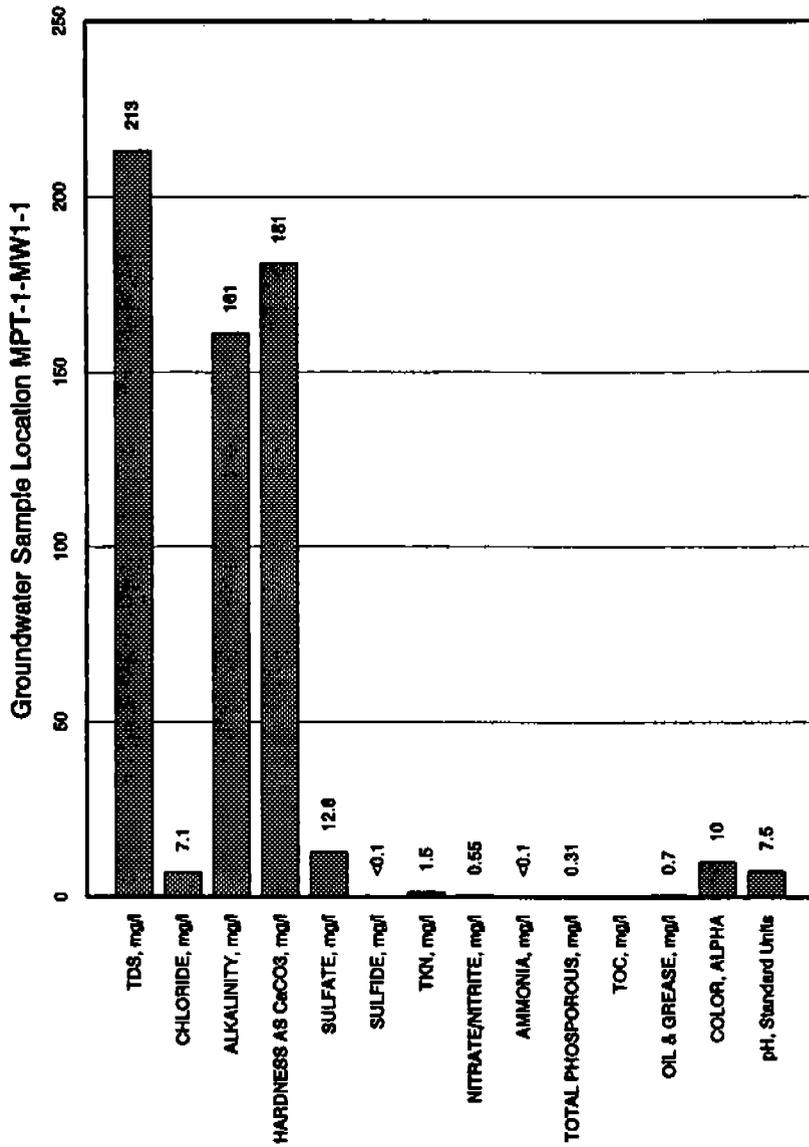
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USEPA Method	Analyte	Unit	Concentration Samples from:	
			MPT-1-MW1-1	MPT-S-1-1
160.1	Total dissolved solids	mg/ℓ	213	405
325.1	Chloride	mg/ℓ	7.1	12
376.1	Sulfide	mg/ℓ	<0.1	<0.1
375.4	Sulfate	mg/ℓ	12.8	66.3

Notes: USEPA = U.S. Environmental Protection Agency.
 mg/ℓ = milligrams per liter.

General water quality of the background groundwater samples appears to be potentially potable as assessed by these general parameters. Secondary standards (Chapter 17.550.320, FAC) for TDS, chloride, and sulfate are 500, 250, and 250 mg/ℓ , respectively. The background groundwater samples were within these limits. These values are exceptional relative to the general groundwater quality measured at other locations at NAVSTA Mayport. Most groundwater samples exceeded 17.550.320, FAC, secondary standards for one or more parameters and would not be acceptable potable supplies, as discussed in subsequent sections. The water

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FIGURE 4-13
GENERAL WATER QUALITY DATA FROM
BACKGROUND MONITORING WELL
MPT-1-MW1

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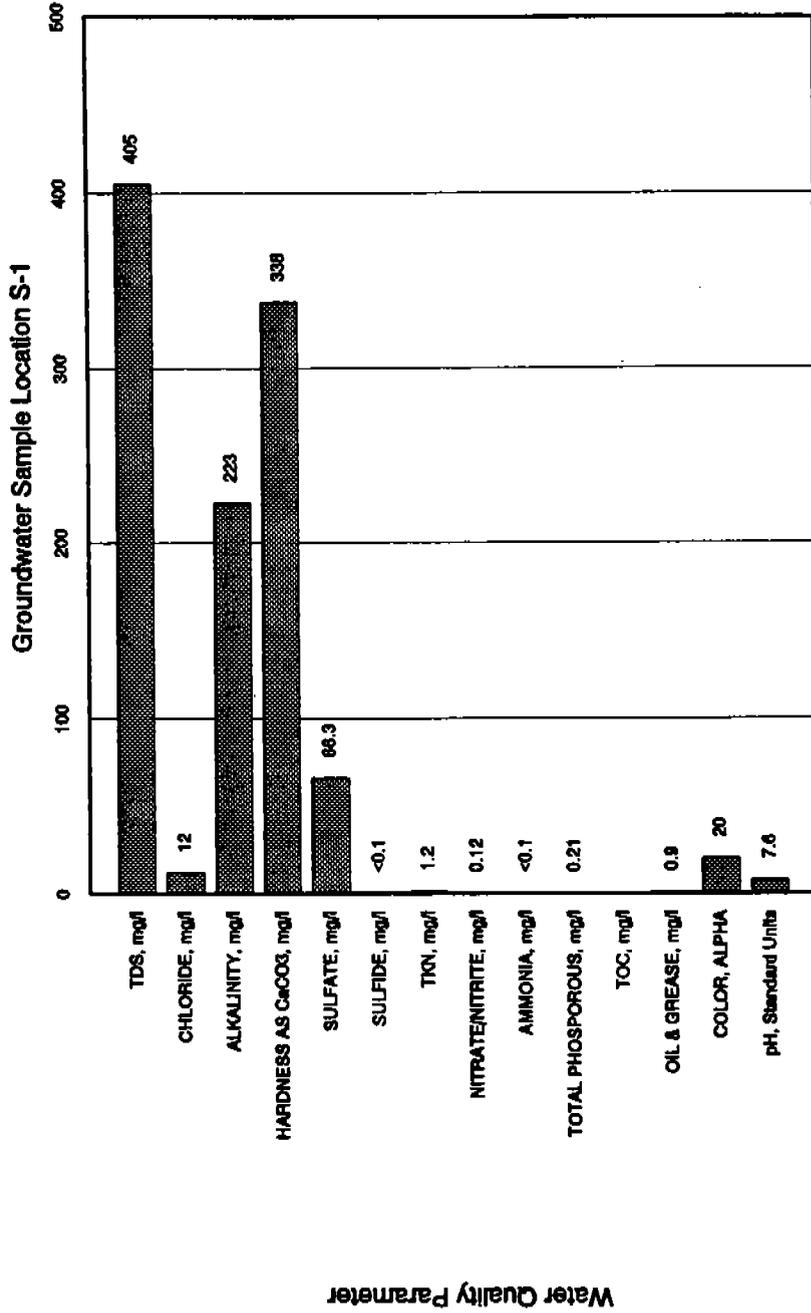


FIGURE 4-14
GENERAL WATER QUALITY DATA FROM
BACKGROUND MONITORING WELL S-1



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quality of the background samples most likely reflects conditions in shallow upland locations of the surficial aquifer at NAVSTA Mayport.

Table 4-8 summarizes the results for chemicals detected above quantitation limits in the background groundwater samples. Sample MPT-1-MW1-1 was also analyzed by USEPA Method 601 in order to achieve detection limits consistent with Florida primary drinking water standards for VOC. No VOC was reported above detection limits in this sample. No pesticides or PCBs were detected in any groundwater samples. Carbon disulfide and benzo(a)anthracene were detected in a sample from one well. Inorganic compounds (arsenic, barium, copper, lead, selenium, vanadium, zinc, and cyanide) were detected at low concentrations in groundwater samples. Samples for metals were collected without filtration and were preserved immediately after collection with acid. The metal results are, therefore, total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions.

Table 4-8
Detected Organic and Inorganic Chemicals in
Background Groundwater Samples

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20902		20902	
Sample Matrix:			Water		Water	
Location/Sample No.:			MPT-S-1-1		MPT-1-MW1-1	
Date Sampled:			02/12/92		02/12/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.
75-15-0	Carbon disulfide	µg/l	1	J		
56-55-3	Benzo(a)anthracene	µg/l	2	J		
7440-38-2	Arsenic	µg/l			14.3	J
7440-39-3	Barium	µg/l	0.66	J	0.82	J
7440-50-8	Copper	µg/l			1.40	J
7440-92-1	Lead	µg/l	1.4	J	2.5	J
7440-49-2	Selenium	µg/l			0.63	J
7440-62-2	Vanadium	µg/l	2.2	J	9.40	J
7440-66-6	Zinc	µg/l	2.4	J	10.20	J

Notes: Laboratory data validated with NEESA Level C criteria.
Conc. = concentration.
Qual. = Qualifier.
µg/l = micrograms per liter.
*J = estimated value.

Carbon disulfide was detected at low concentrations in sample MPT-S-1-1 at an estimated concentration of 1 µg/l. Benzo(a)anthracene was reported at an estimated concentration of 2 µg/l in sample MPT-S-1-1. No other organic compounds were reported in any other background groundwater sample. No pesticides or PCBs were reported in any background groundwater sample.

The following metals were detected in the background groundwater samples.

- Arsenic was estimated at 14.3 $\mu\text{g}/\ell$ in sample MPT-1-MW1-1.
- Estimated barium concentrations were 0.66 $\mu\text{g}/\ell$ in sample MPT-S-1-1 and 0.82 $\mu\text{g}/\ell$ in sample MPT-1-MW1-1.
- Copper was estimated in sample MPT-1-MW1-1 at 1.4 $\mu\text{g}/\ell$.
- Estimated lead concentrations were 1.4 $\mu\text{g}/\ell$ in sample MPT-S-1-1 and 2.5 $\mu\text{g}/\ell$ in sample MPT-1-MW1-1.
- Selenium was estimated in sample MPT-1-MW1-1 at 0.63 $\mu\text{g}/\ell$.
- Estimated vanadium concentrations were 2.2 $\mu\text{g}/\ell$ in sample MPT-S-1-1 and 9.4 $\mu\text{g}/\ell$ in sample MPT-1-MW1-1.
- Estimated zinc concentrations were 2.4 $\mu\text{g}/\ell$ in sample MPT-S-1-1 and 10.2 $\mu\text{g}/\ell$ in sample MPT-1-MW1-1.

4.4 BIOLOGICAL INVESTIGATION FINDINGS. Results of the qualitative aquatic survey, the quantitative macroinvertebrate sampling, and the terrestrial survey are discussed separately in the following sections. The results of these biological studies are used in Section 5.2 for the Ecological Assessment.

4.4.1 Qualitative Aquatic Survey The complete results of the qualitative survey are included in Appendix C. Descriptions of each sampling station and field observations are summarized in Table 4-9. Fish and macroinvertebrate species collected using D-frame dip nets and seines are listed in Table 4-10. The fish community observed is typical for estuarine tidal creeks in the lower St. Johns River. Catches were dominated by killifishes of the estuarine families Poeciliidae, Cyprinodontidae, and Fundulidae, with occasional occurrences of several other marine and estuarine species. With the exception of one species, the fat sleeper (*Dormitator maculatus*), all non-killifish species were represented as juveniles; killifish species, by contrast, were found as both adults and juveniles. The killifish species collected are year-round residents of tidal creeks. Spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), striped mullet (*Mugil cephalus*), and the southern stargazer (*Astroscopus ygraecum*) were represented as young-of-the-year (all less than four months old). The presence of these species demonstrates the dynamic nature of these estuarine tidal creeks as seasonal nursery areas for marine fish. Macroinvertebrate species collected also demonstrate the importance of these tidal creeks as nursery areas. Juvenile white shrimp (*Peneaus setiferus*) and blue crabs (*Callinectes sapidus*) were collected during the survey.

The reference (background) stations and station MPT-2-BIO-4 had the greatest representation of marine or estuarine macroinvertebrates (mainly, polychaetes and marine amphipods). The most common species collected were the sailfin molly (*Poecilia latipinna*) and white shrimp. The most abundant taxa were oligochaetes and chironomids. The most abundant chironomid species include *Chironomus* sp. A, *Dicrotendipes* sp., and *Goeldichironomus holoprasinus*.

Table 4-9
Descriptions of Aquatic Survey Locations,
Ecological Assessment

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Station Description		Flora and Fauna Observed
Background locations	MPT-B-BIO-1	Banks vegetated with cordgrass (<u>Spartina alterniflora</u>).
	MPT-B-BIO-2	Banks vegetated with cordgrass. Duckweed (<u>Spirodela</u> sp.) observed on water surface. Transitional vegetation includes cabbage palm (<u>Sabal palmetto</u>), eastern red cedar (<u>Juniperus virginica</u>), giant maidencane (<u>Phragmites</u> sp.), oak (<u>Quercus</u> sp.), groundsel bush (<u>Baccharis</u> sp.), and wax myrtle (<u>Myrica cerifera</u>).
	MPT-B-BIO-3	Clumps of oysters (<u>Crassostrea virginica</u>) observed along the vegetated bank. Most abundant saltmarsh vegetation includes black needlerush (<u>Juncus roemerianus</u>) and cordgrass. Transitional vegetation includes wax myrtle and cabbage palm.
	MPT-2-BIO-2	Emergent vegetation dominated by cattail (<u>Typha</u> sp.). Transitional vegetation includes cabbage palm, eastern red cedar, and groundsel bush.
	MPT-2-BIO-4	Canal lined with cordgrass. Transitional vegetation includes salt grass (<u>Distichlis spicata</u>) in the high marsh and groundsel bush along the road shoulder.
SWMUs 2, 3, 4, and 5	MPT-2-BIO-5	The canal and Sherman Creek tributary are lined with cordgrass. High marsh vegetation includes salt grass. Transitional vegetation along the road shoulder includes groundsel bush.

Table 4-9 (Continued)
Descriptions of Aquatic Survey Locations,
Ecological Assessment

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Station Description		Flora and Fauna Observed
SWMUs 2, 3, 4, and 5 (continued)	MPT-2-BIO-6 Roadside canal southeast of SWMU 5 and eastern dredge disposal area. Four culverts drain the spoil area dike. A drainage with sulfide-rich odor observed entering through the culverts. Tidal fluctuation = 3 feet. Width = 10 feet. Bottom substrate of soft mud.	Cordgrass lines the canal and extends southeast toward Sherman Creek. Transitional vegetation along the road shoulder includes groundsel bush.
	MPT-2-BIO-8 Tidal ditch at the base of the dike of the western dredge disposal area southwest of SWMU 4. Tidal fluctuation = 3 feet. Width = 30 feet. Bottom substrate of soft mud with emergent vegetation.	Emergent vegetation lining the canal included cattail, cordgrass, and giant bulrush (<i>Scirpus californicus</i>). Transitional vegetation included groundsel bush.
	MPT-2-BIO-9 Tidal ditch northeast of MPT-2-BIO-8 receiving surface water runoff from SWMU 4 and a runway area via culverts. Minimal tidal fluctuation. Width of 20 feet. Bottom substrate of sand and soft mud with emergent vegetation.	Emergent vegetation includes cattail and cordgrass. Duckweed observed on water coming from SWMU 4. Transitional vegetation includes eastern red cedar and groundsel bush.
SWMU 13	MPT-13-BIO-1 Patrol road ditch northeast of SWMU 5 (NRP Site 6) and southeast of SWMU 13. Tidal influence from the southeast with fluctuation of 3 to 4 feet. Width = 12 feet. Bottom substrate of soft mud and vegetated banks.	Cordgrass lines the sides of the canal. Transitional vegetation includes cabbage palm and groundsel bush.
	MPT-13-BIO-2 Patrol road ditch northeast of SWMU 5 and directly south of SWMU 13. Up tidal gradient from MPT-13-BIO-1 separated by a 4-foot-diameter culvert under a roadway. Surface water runoff from SWMU 13 received via culvert. Tidal fluctuation is 3 feet. Width = 20 feet. Bottom substrate of soft mud and vegetated bank.	Cordgrass lined the sides of the canal and formed an island in the center of the canal at the surface water discharge location. Transitional vegetation included groundsel bush.
	MPT-13-BIO-3 Patrol road ditch southwest of SWMU 13. Located at extent of tidal influence from the southeast or the southwest with minimal fluctuation. Connected by a culvert to a surface water retention pond across the patrol road to the north. Width = 20 feet. Bottom substrate of soft mud and shoreline lined with cordgrass.	Transitional vegetation included cabbage palm, eastern red cedar, and groundsel bush.

Table 4-10
Organisms Observed During Qualitative Aquatic and Terrestrial Surveys,
Ecological Assessment

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

	Common Name	Genus/Species
Invertebrates	White shrimp	<i>Penaeus setiferus</i>
	Blue crab	<i>Callinectes sapidus</i> ,
	Eastern oyster	<i>Crossostrea virginia</i>
Fish	Sheepshead minnow	<i>Cyprinodon variegatus</i>
	Eastern mosquitofish	<i>Gambusia holbrooki</i>
	Sailfin molly	<i>Poecilia latipinna</i>
	Gulf killifish	<i>Fundulus grandis</i>
	Mummichog	<i>Fundulus heteroclitus</i>
	Striped killifish	<i>Fundulus majalis</i>
	Inland silverside	<i>Menidia beryllina</i>
	Atlantic croaker	<i>Micropogonias undulatus</i>
	Spot	<i>Leiostomus xanthurus</i>
	Fat sleeper	<i>Dormitator maculatus</i>
Endangered Species	Striped mullet	<i>Mugil cephalus</i>
	Southern stargazer	<i>Astroscopus y-graecum</i>
	Wood stork	<i>Mycteria americana</i>
	Tricolored heron	<i>Egretta tricolor</i>
	Little blue heron	<i>Egretta caerulea</i>
	Snowy egret	<i>Egretta thula</i>

A summary of zooplankton and phytoplankton species collected at each of the survey stations and relative species abundance are listed in Tables 3-4 and 3-5, respectively of Appendix C. Protozoans, rotifers, nematodes, and crustaceans were the major taxa represented in the zooplankton samples. Numerically, the most abundant species were the ciliate protozoans (protozoan *Tintinnida* sp. 1), unidentified rotifer species, and unidentified crustacean nauplii species. Station MPT-B-BIO-2 contained the most species with several species of rotifers (*Brachionus* c.f. *havanaensis*, *B. angularis*, *Lepadella* sp., and *Euchlanis* sp.), unidentified cyclopoid species, and *Daphnia* sp. present.

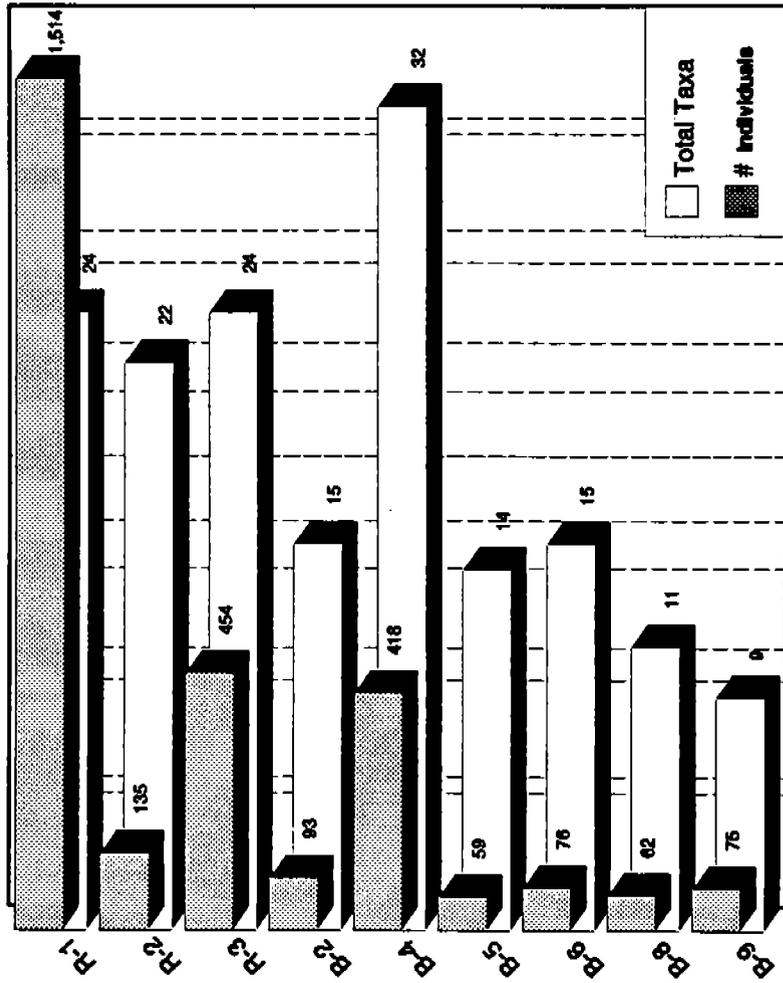
Taxonomically, all major divisions of phytoplankton were well represented. Numerically, cyanobacteria and cryptophyte species were the most abundant with diatom species representing the most common taxa collected at all stations in terms of size and biovolume. The cyanobacteria *Anabaena* sp. No. 2 was found specifically in the patrol road ditch and the ditch east of SWMU 5 (Navy IR program Site 6).

Several phytoplankton species representing a more freshwater condition were found in the samples from station MPT-2-BIO-2. These species included the diatom c.f. *Amphora* sp., the cyanobacteria *Oscillatoria* sp., the green algae c.f. *Chlorella* sp., and the euglenoid *Euglena* sp.

The water quality parameters measured at each of the biological survey stations are discussed in Appendix C and summarized here. Stations MPT-B-BIO-1, MPT-B-BIO-2, MPT-B-BIO-3, MPT-2-BIO-4, MPT-2-BIO-5, and MPT-2-BIO-6 are tidally influenced by Sherman Creek. Stations MPT-2-BIO-2, MPT-2-BIO-8, and MPT-2-BIO-9 are tidally influenced by Chicopit Bay. Sherman Creek is tidally connected with Pablo Creek, which connects to Chicopit Bay and the Intracoastal Waterway. Stations MPT-13-BIO-1, MPT-13-BIO-2, and MPT-13-BIO-3 are located between these drainage pathways. This situation is particularly evident at station MPT-13-BIO-3. The low pH and dissolved oxygen values at this station possibly indicate a nodal point of tidal influence and low water movement and/or influence from a nearby surface water impoundment.

4.4.2 Quantitative Macroinvertebrate Sampling Results and Analyses Macroinvertebrate species identified from each replicate sample collected during the quantitative aquatic survey is included in Appendix C. Species richness (the number of invertebrate taxa) and standing crop (mean number of individual invertebrates) for each station are summarized in Figure 4-15. Mean benthic invertebrate densities (individuals per square meter) for each NAVSTA Mayport station based on three replicate samples are shown with respective standard deviations in Figure 4-16.

The greatest number of taxa (32) were identified in samples from station MPT-2-BIO-4 (B-4; Figure 4-15). The background stations had the next highest numbers of taxa ranging from 22 at MPT-B-BIO-2 (R-2) to 24 at both MPT-B-BIO-3 (R-3) and MPT-B-BIO-1 (R-1). The highest number of individuals (1,514) was identified in samples from R-1. Samples from R-3 and B-4 had total numbers of individuals of 454 and 418, respectively. Mean densities mirror the results for total individuals found at each station. With the exception of B-4, mean densities of invertebrates were lower for all survey stations compared to the background stations. The standard deviations (or variability) calculated for the mean based on the replicate samples were typical for benthic studies representing the high

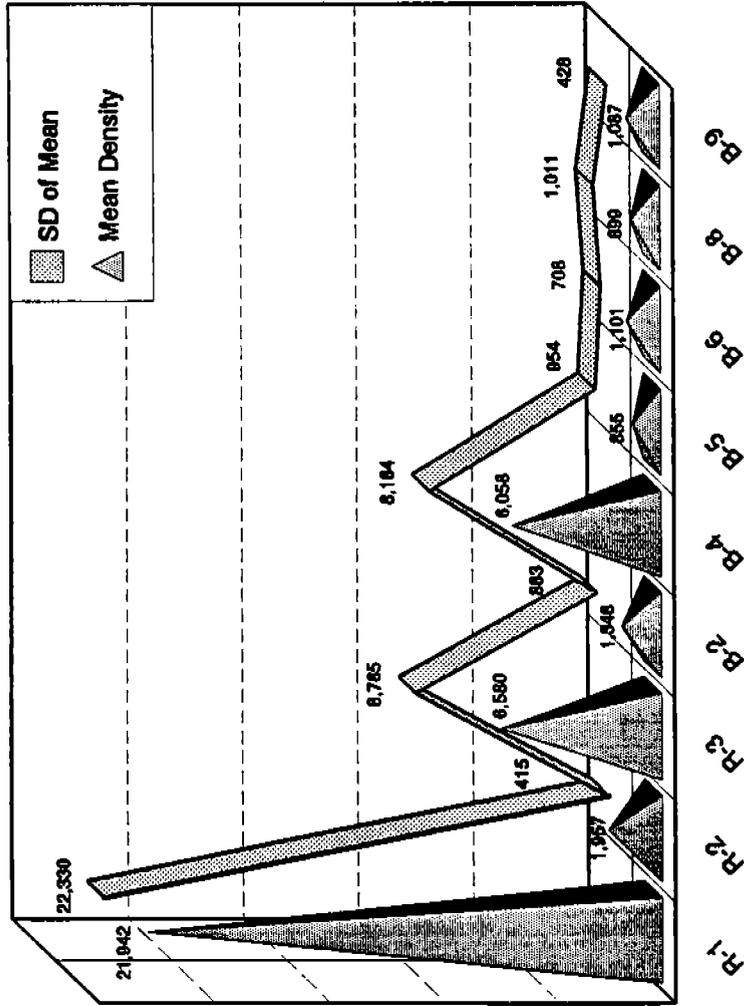


**FIGURE 4-15
NUMBER OF MACROINVERTEBRATE TAXA
AND INDIVIDUALS AT AQUATIC SAMPLING
STATIONS**



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Individuals per Square Meter



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FIGURE 4-16
MEAN DENSITY OF MACRONVERTEBRATES
WITH STANDARD DEVIATION FOR THREE
REPLICATE SAMPLES

variability associated with benthic macroinvertebrate populations. For most benthic macroinvertebrate studies, it is generally impractical to detect population changes of less than 100 percent of the mean (USEPA, 1990). The standard deviations of the mean densities for macroinvertebrate sampling at NAVSTA Mayport (Figure 4-16) were generally within 100 to 150 percent of the mean.

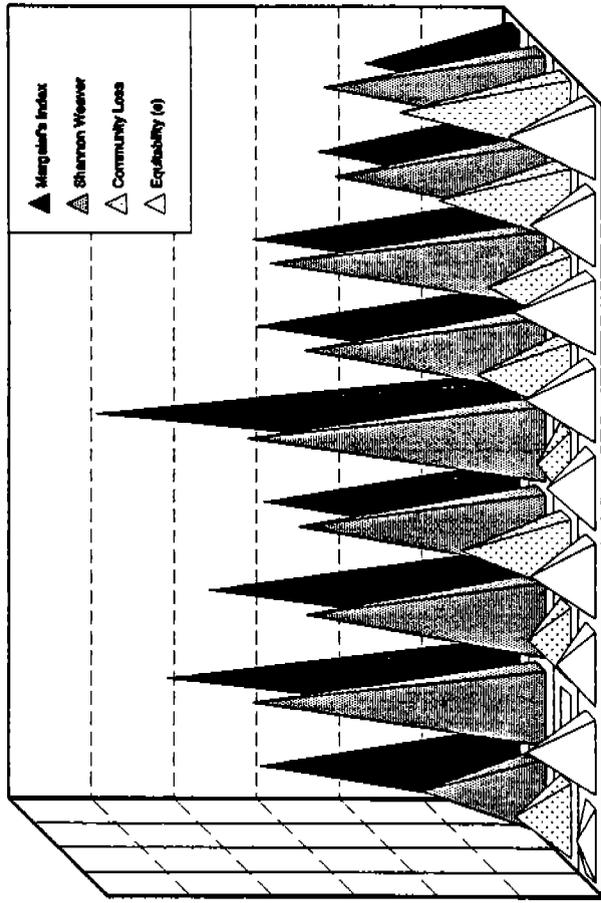
For each station, indices of community structure and function were calculated using the Shannon and Weaver Diversity Index, Margalef's Index, an equitability index, Pielou's Evenness Index, and a Community Loss Index. Appendix C contains the parameters (Table 3-6) and equations used for calculation of the indices. The results are shown in Figure 4-17 and discussed in the following sections.

Diversity. Mean diversity was calculated according to the equation of Shannon and Weaver (1973) and Margalef (1951 or 1957). Diversity is a measure of the heterogeneity in a community or assemblage of organisms. Mean diversity is affected both by richness of species (number of species present) and by the distribution of individuals among the species. The Shannon Weaver value may range from 0 to $3.321928 \log N$ where N = the total number of individuals. This index is often insensitive to subtle changes in community structure unless the environment has been grossly modified; however, it is often used to calculate other indices (USEPA, 1990).

For survey stations near the SWMUs, the Shannon and Weaver Diversity Indices (d) ranged from 2.49 at MPT-2-B-8 (B-8; Figure 4-17) to 3.54 at B-4. Values for the background stations ranged from 1.44 at MPT-B-BIO-1 (R-1; Figure 4-17) to 3.49 at MPT-2-BIO-R-2. The low diversity value at R-1 is a result of the dominance (78 percent) of the total number of individuals by a lumbriculid oligochaete. The aquatic habitat at R-1 is different from the ditches surrounding the SWMUs where the study stations are located. The habitat differences may explain the low diversity value calculated for R-1. R-1 is wider, bordered on one side by a paved roadway, and has little vegetative cover. The study stations are conversely shaded by vegetation and bordered by marsh. R-1 (MPT-13-B10-1) along the Peremeter Road Ditch and likely receives runoff from a golf course on the opposite side of the road (Figures 3-1 and 3-5). Due to the habitat differences, R-1 is not considered to be a good background station and comparisons of indices were made with the remaining two background stations, R-2 and R-3. Biological diversities are 84 percent, 82 percent, 94 percent, 71 percent, and 75 percent, for B-2, B-5, B-6, B-8, and B-9, respectively, of that measured at R-2. Two of the Shannon and Weaver Diversity Index values (for B-8 and B-9) fell within or below the 75 percent reduction in biodiversity standard set by the State of Florida in Surface Water Quality Standards.

Diversity represented by Margalef's Index provides results similar to the Shannon and Weaver Index (Figure 4-17). Diversity was also highest at B-4 with a value of 5.14. Using R-2 for comparison, diversity was lower at all study stations with the exception of B-4. Diversities as calculated based on Margalef's Index were 72 percent, 74 percent, 75 percent, 56 percent, and 43 percent of that calculated for R-2.

Equitability. Calculated diversity was compared with a hypothetical maximum diversity to evaluate the component of diversity due to the distribution of individuals among the species (or species composition). Two indices were



	1	2	3	4	5	6	7	8	9	10
Margalek's Index	3.14	4.28	3.78	3.09	5.14	3.19	3.23	2.42	1.85	
Shannon Weaver	1.44	3.49	2.84	2.80	3.54	2.86	3.28	2.49	2.62	
Community Loss	0.82	0	0.46	1.27	0.34	1.07	0.83	1.54	2	
Equability (e)	0.17	0.77	0.42	0.73	0.53	0.78	0.86	0.73	1	



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**FIGURE 4-17
INDICES OF MACROINVERTEBRATE
COMMUNITY STRUCTURE AND FUNCTION**

calculated to evaluate species composition including Pielou's Evenness Index (J) (1966) and an equitability index (e) of Lloyd and Ghelardi (1964). Pielou's Index is based on the Shannon and Weaver Index value compared to a hypothetical maximum based on species in all samples. The equitability index value (e) is based on a comparison of the number of taxa in the sample with the number of species expected (s') from a community that conforms to the MacArthur Broken Stick Model (1957). The MacArthur Model results in a distribution frequently observed in nature; one with a few relatively abundant species and increasing numbers of species represented by only a few individuals. The equitability values are read from a table in Lloyd and Ghelardi (1964).

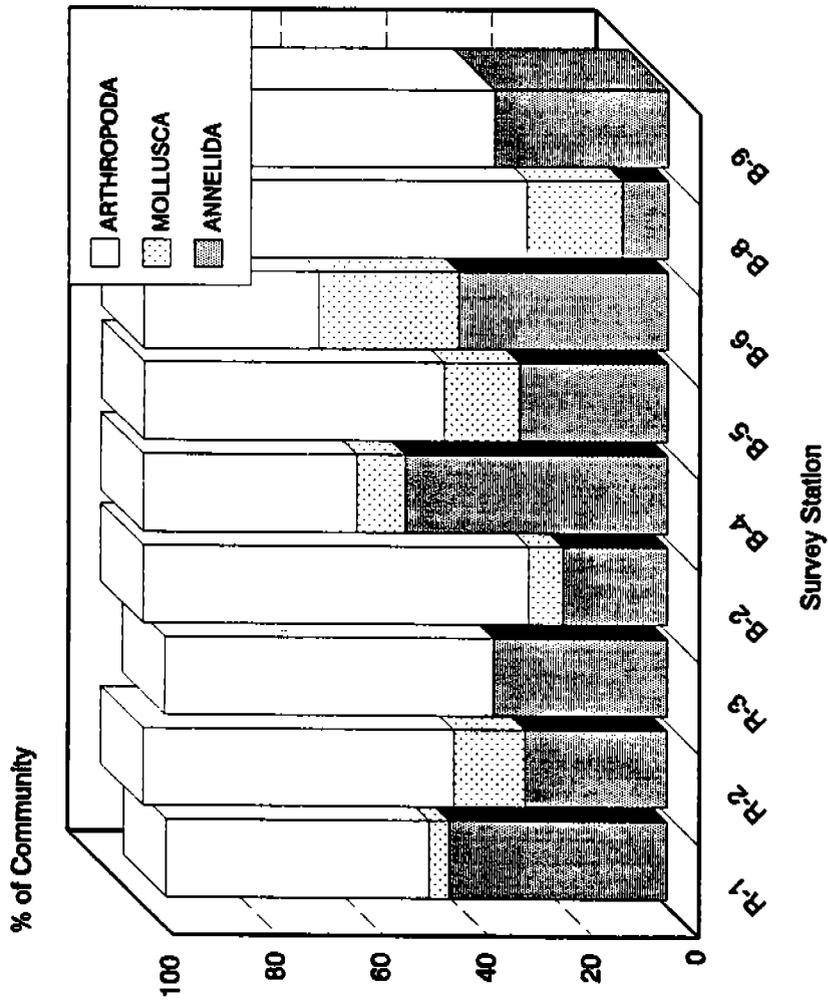
The equitability index is very sensitive to slight changes in community structure, determining the relative "stability" of the community by demonstrating the distribution of individuals within taxa. The index has a range of values from 0 to 1 with 1 being a community equitable with expected values. Equitability index values below 0.5, in general, indicate a community dominated by specific taxa and are considered unstable. Equitability values were below 0.5 at reference stations R-1 and R-3 (Figure 4-17). Equitability was near expected (1) at B-6 and B-9 (Figure 4-17).

The Pielou's values are not as sensitive as the "e" values for evaluating species composition. The trends were the same as the "e" values, but all values exceeded 0.5 with the exception of R-1.

Community Similarity. Community similarity was calculated to compare background reference stations to project area (SWMU) stations using the Community Loss Index. The coefficient of community loss (I) measures the loss of benthic taxa between a reference station and the station of comparison (Courtemanch and Davies, 1987). The index increases as the degree of dissimilarity from the reference station increases. Values range from zero to infinity.

The reference stations were relatively comparable to one another with community loss index values ranging from 0.46 and 0.68. The community at B-4 was the most comparable to R-2 with a community loss value of 0.34. Community loss values exceeded 1 at four of six stations (B-2, B-5, B-8, and B-9; Figure 4-17) with the highest value of 2 at B-9 indicating benthic communities that are dissimilar to the reference station (R-2).

Percent Composition of Dominant Taxa. The percent composition of dominant taxa is calculated as the ratio of the taxonomic group with the most individuals (dominant) to the total number of organisms. Figure 4-18 presents the percent contribution of total taxa within arthropoda, mollusca, and annelida collected at each station. Annelid and arthropod taxa dominated most stations. The sphaeromatid isopod *Cassidinidea ovalis* composed 28 percent of the total number of individuals sampled at R-2. The chironomids *Chironomus* sp. and *Goeldichironomus holoprasinus* were 22 percent and 18 percent, respectively, of the total number of individuals sampled at B-2. Lumbriculid and tubificid oligochaetes and the polychaete *Streblospio benedicti* compose 24 percent, 17 percent, and 14 percent, respectively, of the total number of individuals sampled at B-4. The chironomid *Dicrotendipes* sp. composed 41 percent of the invertebrate community sampled at B-5. At station B-6, a hesionid polychaete, a hydrobiid gastropod, and a tubificid oligochaete comprised 25 percent, 14 percent, and 13 percent, respectively, of the total number of individuals sampled. The community sampled



**FIGURE 4-18
COMPOSITION OF MACROINVERTEBRATE
COMMUNITY**



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from station B-8 included the ostracod *Haplocytheridea* sp. A and the chironomid *Goeldichironomus holoprasinus* at 39 percent and 29 percent, respectively. *Goeldichironomus holoprasinus*, the psychodidae *Telmatoscopus superbus*, and *Chironomus* sp. at MPT-2-BIO-9 composed 25 percent, 20 percent, and 15 percent, respectively, of the total number of individuals sampled.

The results of the quantitative macroinvertebrate sampling are further discussed in Section 5.2 in relation to the results of chemical analyses of sediments and surface waters. Results are considered in relation to physical and chemical habitat limitations as well.

4.4.3 Terrestrial Survey The 1986 IAS provided locations and descriptions of habitats at NAVSTA Mayport (Figure 4-4 in ESE, 1986). The locations of the pine flatwoods and coastal marsh near SWMUs 2, 3, 4, and 5 are correct in the IAS. The coastal marsh at the southeastern end of SWMU 5 actually extends into the NAVSTA site; and the freshwater marsh on SWMUs 2, 3, and 5 (Navy IR program Sites 2, 4, and 6) are not shown on the IAS Figure (ESE, 1986). An updated map based on the current study is included as Figure 3-5. Major habitat types on and adjacent to the SWMUs consist of coastal marsh, freshwater marsh, weedy transitional freshwater wetlands, weedy ditches and ditch banks, pines, open field, mowed field, and cabbage palm hammocks. Terrestrial habitats including wetlands are discussed in the following sections for each SWMU.

SWMU 2. SWMU 2 is completely covered by asphalt and has a building on the west end. The vegetation, which is between the fence and the asphalt, is minimal within the site. Wetlands are located at the extreme west end and extend north and south between the pavement and the fence. This wetland is considered a weedy ditch bank. Immediately west of the fence is a ditch. The dominant vegetation on this site is seashore paspalum and bermuda grass. This area is classified as a mowed turf.

SWMU 3. This site consists of a roadside, a portion of a levee, and a graded fill area behind the levee. A sabal palm hammock dominated by sabal palms, slash pines, and southern red cedars is immediately east of the site. The roadsides on the north and west sides are bordered by weedy ditches, which are wetlands. The levee itself is not a wetland, but the fill area within the levee is a weedy transitional freshwater wetland. The dominant vegetation found on this site (Table H-2; Appendix C) includes marsh elder, bushy broom grass, Bermuda grass, blue maidencane, and sharp-pod morning glory, which classifies this area as old field. The area is disturbed from fill placed at the site and may be better classified as a disturbed site.

SWMU 4. Vegetation covering SWMU 4 is extremely weedy. There is a grove of young pines on the north end and a high mound of soil just north of the center. No part of this site is considered a wetland. Vegetation found on the site includes slash pine, groundsel bush, southern sandspur, camphor weed, crowfoot grass, Bermuda grass, and white sweet clover (Table H-3; Appendix C). This site is considered a weedy old field.

SWMU 5. The southeastern part of SWMU 5 is a coastal marsh and the north end is a freshwater marsh with additional freshwater marshes in the southwestern part on both sides of the berm. A vehicle storage facility is located in the eastern part. Several plant associations are found in the area (Table H-4; Appendix C) including the following.

1. Coastal Marsh is dominated by sea oxeye, perennial glasswort, salt grass, marsh elder, christmas berry, saltmarsh cord grass, and black needle rush.
2. Freshwater Marsh is dominated by coastal plain willow, seashore paspalum, seaside goldenrod, hair grass, southern cat-tail, seashore dropseed, and elderberry.
3. Cabbage Palm Hammocks (two separate hammocks) are dominated by cabbage palm.
4. Planted Pines are dominated by slash pine and wax myrtle.
5. Mowed Field is dominated by cranesbill, black medic, common dandelion, common chickweed, and seashore parpelum.
6. Old Field is dominated by common beggar's-tick, pennywort, Bermuda grass, match-head, camphor weed, southern dewberry, maypop, and sharp-pod morning-glory.

SWMU 13. SWMU 13 is covered by asphalt and buildings. The areas with vegetation (Bermuda grass and St. Augustine grass) are limited and are classified as mowed turf with no wetlands present (Table H-5; Appendix C).

Because of the nature of the SWMUs, wildlife species that inhabit the areas are generally those species associated with urban areas and human disturbance. Species common to these areas include the raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), skunk (*Mephitis mephitis*), gray squirrel (*Sciurus carolinensis*), rabbit (*Sylvilagus floridanus*), shrews, bats, and a variety of reptiles, rodents, and birds. Many species of waterfowl and wading birds inhabit the wetlands (particularly the drainage ditches and dredge spoil area) for foraging, or temporarily during migration.

Wildlife species listed as endangered or potentially endangered and observed on or near the sites during the survey are listed in Table 4-10. According to records maintained by Florida Game and Freshwater Fish Commission (FGFWFC), no known eagle nests or wading bird rookeries are located on NAVSTA Mayport. Wood storks were observed in grassy areas near SWMU 5. The tricolored heron (*Egretta tricolor*), little blue heron (*Egretta caerulea*), and snowy egret (*Egretta thula*) were observed foraging in ditches and in standing water immediately off-site near SWMUs 2, 3, 4, or 5. Use of wetlands by these species, and by other wading birds, is common to the region.

Although not observed during the survey, other rare, endangered or threatened wildlife species may inhabit areas on or near the SWMU's. As noted in the IAS, these species include the American alligator (*Alligator mississippiensis*), bald

eagle (*Haliaeetus leucocephalis*), Southeastern kestrel (*Falco sparverius paulus*), and arctic peregrine falcon (*Falco peregrinus tundrius*) (ESE, 1986). The arctic peregrine falcon is found in Florida only as a migrating winter resident. Kestrels were observed foraging on SWMUs 4 and 5, but it could not be determined whether they were the threatened southeastern subspecies or the migratory non-listed subspecies that winters in Florida.

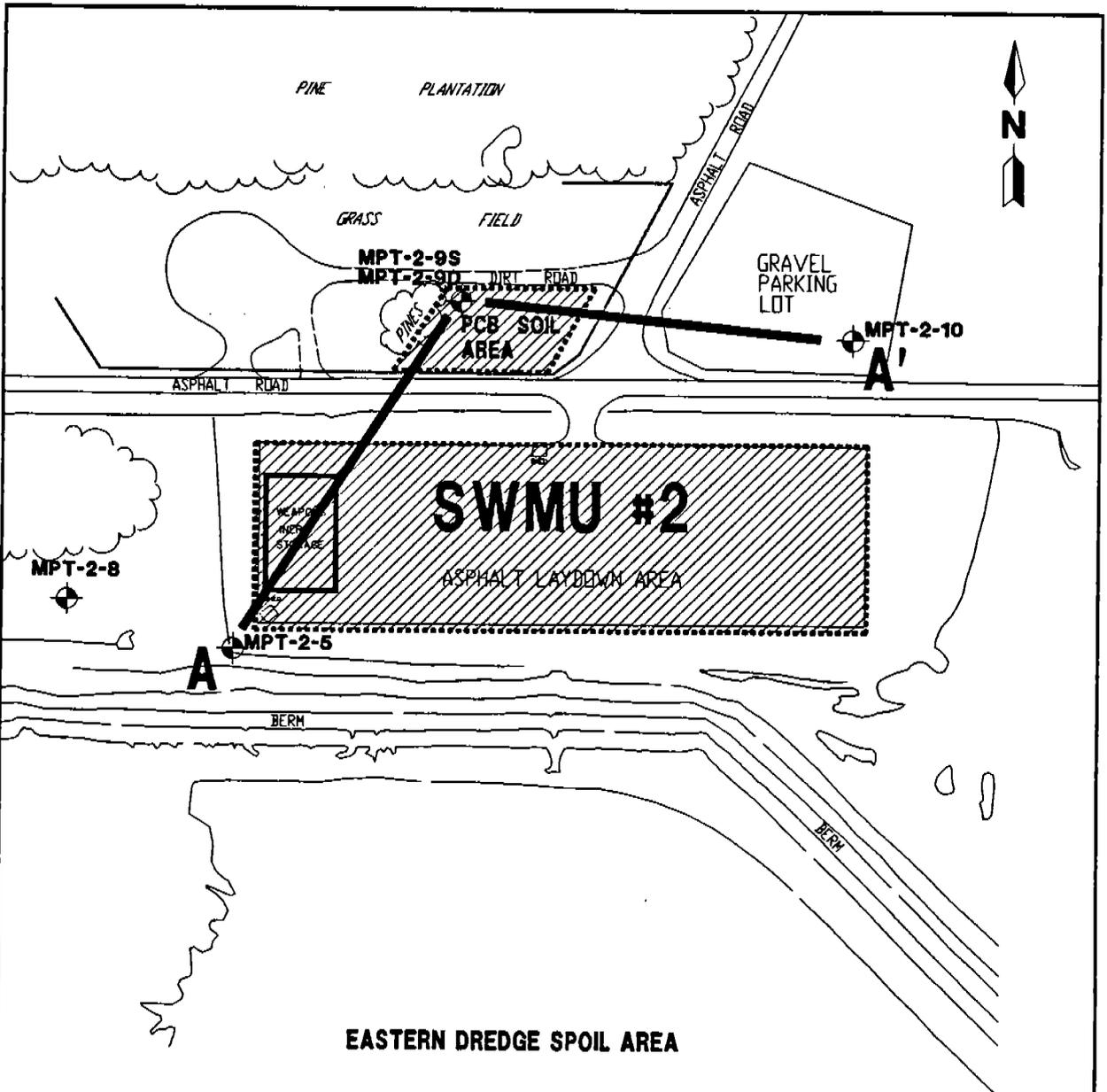
4.5 SWMU 2, LANDFILL B.

4.5.1 SWMU 2 Description Historic information on the permitted SWMUs at NAVSTA Mayport had been consolidated in the IAS in 1986. The IAS was conducted under the Navy's earlier program that addressed the CERCLA of 1980. The following information on the disposal activities at SWMU 2, Landfill B, was obtained from this study (ESE, 1986).

SWMU 2, Landfill B, is located at the current ordnance storage area, north of the eastern dredge spoils area (Figure 4-19). The landfill was operated from 1960 to 1964 as a trench and fill operation, and from 1979 to 1980 as a surface disposal area. SWMU 2 is approximately 2 acres in size and up to 8 feet deep. Trenches were constructed by a dragline and were approximately 15 feet wide and 300 feet long (excavated in incremental stages). The trenches intersected the water table, and waste was deposited into the standing water. Combustible material above water was burned daily. Wastes included: sanitary wastes, oils, asbestos, paints, toluene, mercury lamps, hydraulic fluids, solvents, sulfuric acid, transformer oil, plating solutions, batteries, pesticide cans, and photographic wastes, as well as other materials. The landfill was temporarily closed in 1964. The IAS estimated that 54,000 gallons of liquid waste had been disposed at the site.

The site was used as an area landfill between 1979 to 1980. Items were deposited on the surface of the old fill. After 1980, the area was graded and covered with approximately 3 feet of soil. It was paved with asphalt and is now used as an ordnance storage yard for non-explosive material and equipment. A steel maintenance building and other minor support structures are constructed on the site. The entire area is enclosed with an 8-foot chain-linked fence with a locking gate.

4.5.2 Summary of Previous Findings Soil and groundwater were collected and analyzed for Priority Pollutant List Compounds at SWMU 2 during the ESI in 1987 (Figure 4-20). Chlorobenzene (44 $\mu\text{g}/\text{kg}$) and toluene (553 $\mu\text{g}/\text{kg}$) were detected in a soil boring sample from MPT-2-5. Chlorobenzene (37 $\mu\text{g}/\text{kg}$), toluene (232 $\mu\text{g}/\text{kg}$), and 1,1,1-trichloroethane (122 $\mu\text{g}/\text{kg}$) were detected in a soil boring sample from MPT-2-8, but not in its field duplicate. No VOCs were detected in groundwater. The only SVOC detected at Site 2 was di-n-butyl phthalate found in the groundwater sample collected from monitoring well MPT-2-9S at a concentration of 20 $\mu\text{g}/\ell$. PCB-1260 was detected in the soil sample obtained from boring MPT-2-9 at 2,576 mg/kg . Priority pollutant pesticides were not detected in either soil or groundwater samples collected at SWMU 2. Priority pollutant metals consisted of total lead in groundwater from monitoring wells MPT-2-5 (2 $\mu\text{g}/\ell$) and MPT-2-10 (4 $\mu\text{g}/\ell$).



LEGEND

-  Approx Location of Monitoring Wells
-  Approx Location of SWMU Boundaries
-  Geologic Cross Section Baseline

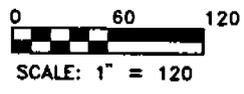


FIGURE 4-19
SWMU 2 - LANDFILL B
SITE PLAN



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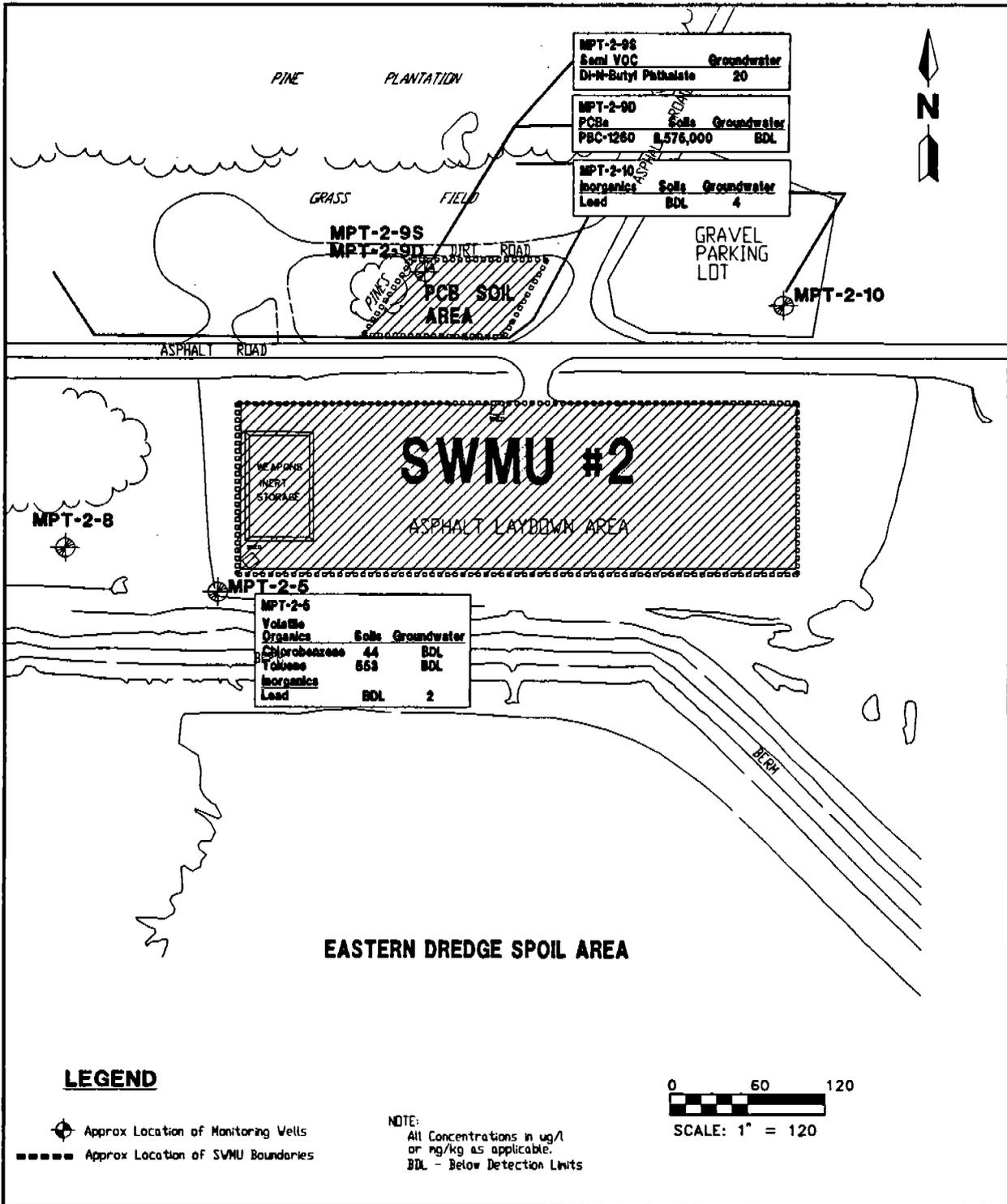


FIGURE 4-20
SWMU 2 - LANDFILL B
EXPANDED SITE INVESTIGATION (ESI)
FINDINGS



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4.5.3 Summary of Exploration and Sampling Program The exploration program at SWMU 2 included the following data-gathering activities:

- installation of a piezometer in the surficial aquifer to gather additional groundwater elevation data near SWMU 2;
- sampling and analyzing surface soils in an area of suspected PCB soil contamination detected during the ESI; and
- sampling and analyzing groundwater at four existing monitoring wells.

Table 4-11 presents a summary of the number of samples and types of analysis obtained at SWMU 2. The locations of these exploration and sampling activities at SWMU 2 are presented in Figure 4-19. The data gathering activities were composed of the field activities listed below. Field activities followed the standard operating procedures in project-specific Technical Memoranda located in Appendix B, Site-Specific Quality Assurance Plan of the RFI Workplan, Volume II (U.S. Navy, 1991b) and as summarized in Chapter 3.0 of this report.

**Table 4-11
Summary of SWMU 2 Chemical Analyses**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

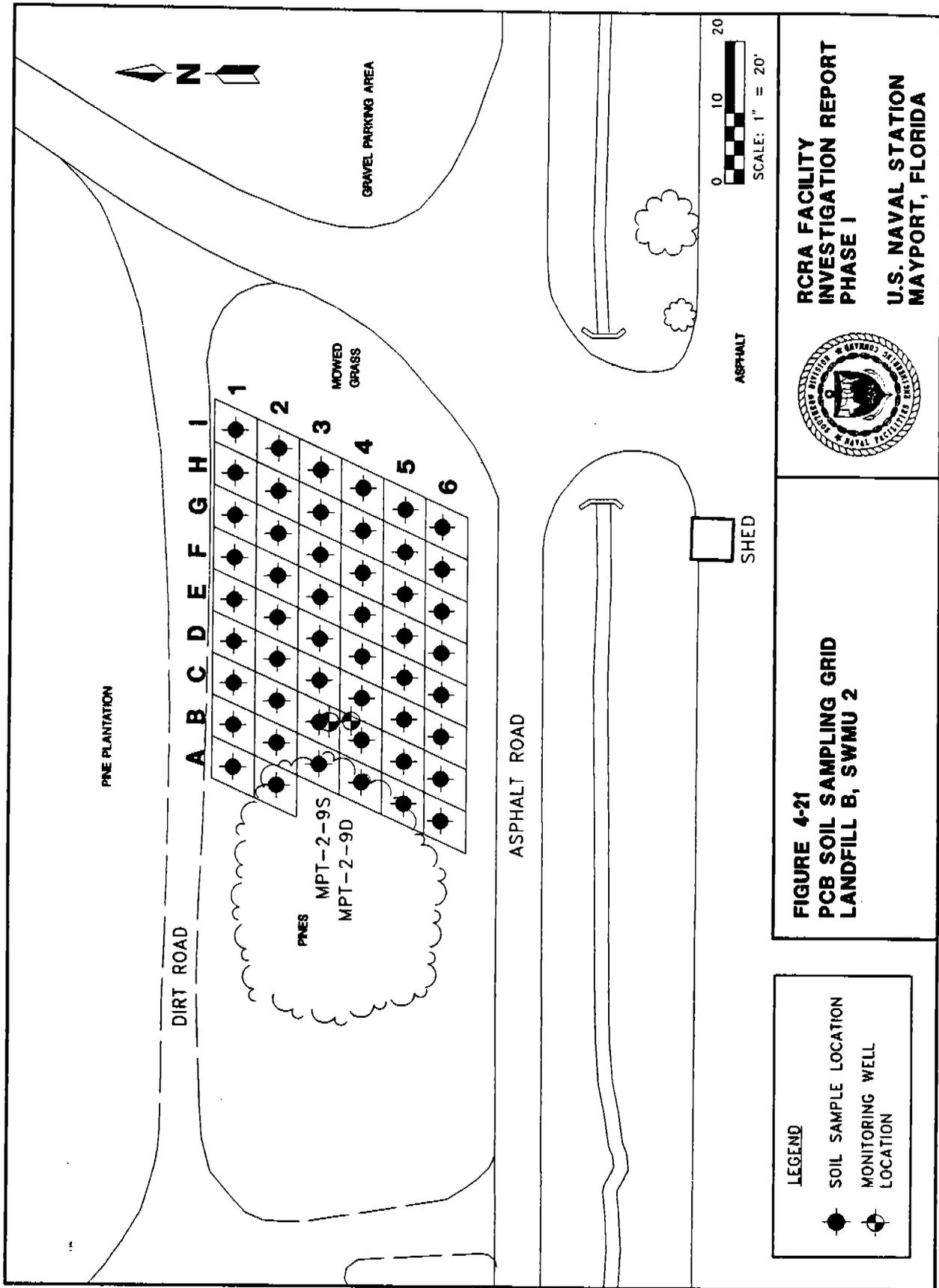
Sample Source	Media	U.S. Environmental Protection Agency SW-846 ¹						Totals
		Method 8240 VOC	Method 8270 SVOC	Method 6010, 7470, 7480 Metals	Method 8080 Pest/PCB	General Parameters (soil)	General Water Quality	
SWMU 2	Soil ²	0	0	0	44	0	0	44
	Groundwater ²	5	5	5	5	0	5	25

¹ Selected Appendix IX Groundwater Monitoring List Compounds as analyzed by method indicated.

² Includes field duplicate samples.

Notes: VOC = volatile organic compounds.
SVOC = semivolatile organic compounds.
Pest/PCB = organochlorine pesticides and polychlorinated biphenyls.
SWMU = solid waste management unit.

Surface Soil Sampling. Surface soil sampling was accomplished as described in the Technical Memorandum, Surface Soil Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b). Surface soil sample locations are shown in Figure 4-21. A 50-node triangular sampling grid with 10-foot spacing was placed over the suspected PCB soil area near well cluster MPT-2-9S/D. This area is adjacent to SWMU 2. As discussed in the RFI Workplan (U.S. Navy, 1991b) surface soil samples were collected in the 0- to 6-inch interval bls at each of the 50 grid nodes. Each sample was collected with a clean stainless-steel spoon and placed in a clean glass mixing bowl. The sample was mixed to homogenize it as much as practical. A subsample was taken from the bowl and placed in an 8-ounce glass wide-mouth jar with a Teflon[™]-lined lid.



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**FIGURE 4-21
PCB SOIL SAMPLING GRID
LANDFILL B, SWMU 2**

LEGEND

- SOIL SAMPLE LOCATION
- ⊗ MONITORING WELL LOCATION

After collection, the samples were transported to an onsite field laboratory where the soil samples were analyzed the same day using a PCB field screening method (Chlor-N-Soil™). A 10-gram aliquot of soil was taken from each 8-ounce jar and placed in a Chlor-N-Soil kit test tube for analysis. Each jar was resealed and placed on ice for possible shipment to the laboratory.

The Chlor-N-Soil™ screening technique is a colorimetric method that indirectly measures PCB by determining the amount of organic chlorine present in a sample. It is prone to interferences and assessing color changes is subjective. Due to these limitations, it was decided after initial trials with the field kit to judge a sample positive (i.e., PCB present) if any obvious color change was observed as judged by at least two field observers. Twenty-two samples were judged to be positive for PCB after screening all 50 samples with the Chlor-N-Soil™ kits. These samples were labeled, placed on ice, packaged, and shipped to the laboratory under chain of custody for PCB analysis using USEPA Method 8080. Field screening and shipment to the laboratory all occurred on the same day as collection of a specific soil sample.

Additional soil samples were collected at a depth of 6 to 12 inches using stainless-steel hand augers at the locations where PCB was detected with the field kit. These samples were mixed, placed in 8-ounce jars, placed on ice, packaged, and shipped to the laboratory under chain of custody for PCB analysis using Method 8080. No field kit analyses were run on these samples. All sampling equipment was thoroughly decontaminated in accordance with procedures presented in Appendix B of the USEPA, ESD Region IV SOP (USEPA, 1991b) and Decontamination Procedures, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b).

Piezometer Construction and Development. One new surficial aquifer piezometer was installed during Phase 1 field activities downgradient of SWMU 2. This piezometer, along with other monitoring wells in the area, provided data on aquifer and groundwater flow characteristics. Table 4-12 summarizes the inventory of wells and piezometers existing at SWMU 2. Figure 4-20 presents the locations of existing monitoring wells and piezometers at or near SWMU 2. Piezometer construction and development was accomplished as described in the Technical Memorandum, Well Construction and Development, Appendix B, of the RFI Workplan, Volume II (U.S. Navy, 1991b). Well and piezometer construction details are presented in Appendix A, Volume II of this report.

Groundwater Sampling. Groundwater sampling was accomplished as described in the Technical Memorandum, Groundwater Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b). A total of five groundwater samples were collected, one from each monitoring well and a duplicate. Samples were analyzed by USEPA SW-846 methods specified in the Workplan. Selected general water quality parameters were also measured in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983).

4.5.4 Environmental Setting Data from the IAS and ESI indicated that groundwater and surface soils were the principal media of concern at SWMU 2 based on past waste disposal practices, site closure methods, and SWMU-specific analytical measurements. This section summarizes the geological and hydrogeological factors affecting contaminant fate and migration in these media at SWMU 2.

Table 4-12
Summary of SWMU 2 Piezometer and Monitoring Well Installations

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU Number	Piezometer and Monitoring Well No.	Phase	Diameter (inches)	Total Depth (feet)	Screened Interval (feet bis)
2	MPT-2-5	ESI	2	10	3 - 10
	MPT-2-9S	ESI	2	11	3 - 10
	MPT-2-9D	ESI	2	25	15 - 25
	MPT-2-10	ESI	2	15	5 - 10
	MPT-2-P5	Phase 1 RFI	2	11	6 - 11

Notes: SWMU = solid waste management unit.

bis = below land surface.

ESI = Expanded Site Investigation; E.C. Jordan; conducted September 1987 to October 1987.

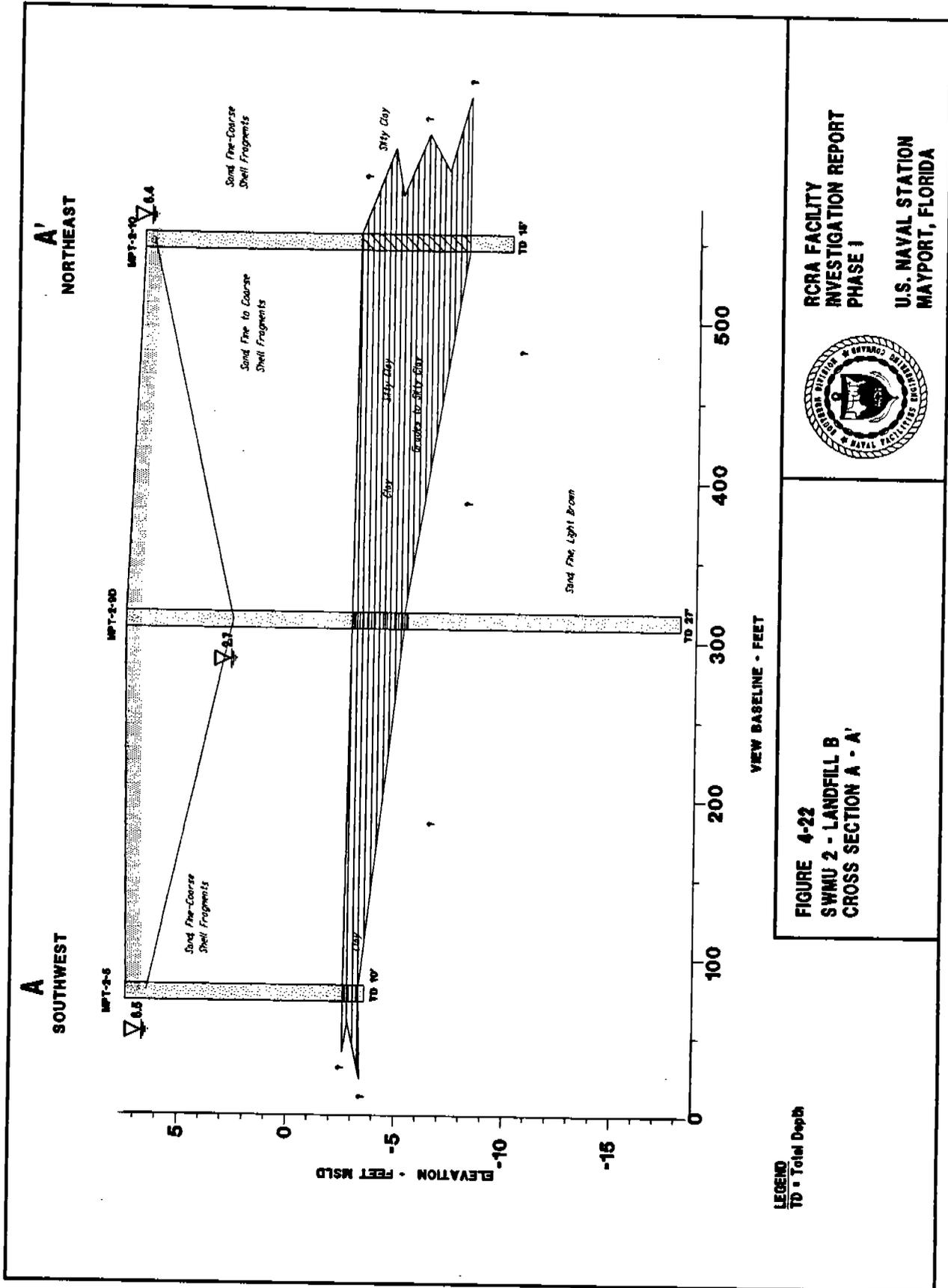
Phase 1 RFI = Phase 1 RCRA Facility Investigation; ABB Environmental Services; conducted January 1992 to March 1992.

4.5.4.1 Geology This section describes the geological setting observed at SWMU 2 during the ESI and Phase 1 RFI. The Upper Hawthorn Group structure at the site is deduced from the deep borings made at SWMU 3 and south of SWMU 4. Physical characteristics of soils at SWMU 2 that affect contaminant migration are estimated from samples collected at adjacent SWMUs in close proximity to SWMU 2.

Geological Setting. Figure 4-22 shows a cross section summarizing the SWMU 2 geology. The cross section was composed from boring logs of monitoring wells and piezometers installed at or near SWMU 2. The cross section illustrates features typical of the Group I SWMUs. The uppermost unit consists of a surficial deposit of material dredged from the Mayport turning basin and the St. Johns River. Typically, beneath the surficial dredge material is a uniform, poorly graded, well sorted, sand (SP) with lenses of a very soft grey to dark-grey silty clay (CH, CM). This sand unit, termed in the cross section undifferentiated post-Hawthorn deposits, grades at depth into the third unit, the Coosawhatchie Formation of the Upper Hawthorn Group (Scott, 1988).

Physical Characteristics of Soil. Borehole soil samples were not collected at SWMU 2 during the Phase 1 RFI. However, borehole soil samples were collected at SWMU 3 and SWMU 22, which are adjacent to SWMU 2 in close proximity (within 500 feet). Using these soil samples as an estimate of conditions at SWMU 2, grain-size distribution appears to vary from poor to moderately well-graded sands. An estimated effective porosity of 0.25 appears reasonable for the sands of the surficial aquifer at SWMU 2. The organic content and ion exchange capacity of the soils are also relatively low. This implies that retardation of contaminants in groundwater flow will be small and, therefore, soluble contaminants would travel at approximately the same velocity as the groundwater.

4.5.4.2 Hydrogeology The hydrogeologic investigations conducted at SWMU 2 during the Phase I RFI collected data to characterize the potentiometric surface of the water table aquifer, estimate hydraulic conductivities, and compute the average velocity of the groundwater flow in the uppermost aquifer at the site. These parameters were estimated from synoptic water table elevations, in-situ



LEGEND
TD = Total Depth

FIGURE 4-22
SWMU 2 - LANDFILL B
CROSS SECTION A - A'



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permeability testing (i.e., slug-tests), and soil characteristics of the aquifer formation. Darcy's Law was used to estimate average groundwater flow velocities.

Slug Test. Both rising- and falling-head slug tests were conducted at SWMU 2 piezometer, MPT-2-P5. Six trials were conducted in order to provide an average of the estimated hydraulic conductivity (K) of the aquifer in the vicinity of the screened interval. From the multiple trials, the precision of the K data was also evaluated. These data are presented in Table 4-13 for SWMU 2. Piezometer MPT-2-P5 had a median *in-situ* conductivity of approximately 5.5 feet per day. The piezometer, MPT-2-P5, was completed in fine-grained sand with an abundance of shell fragments (Volume II, Appendix A, Boring Logs). This is consistent with the *in-situ* conductivity measured at MPT-2-5 during the ESI at 5.7 feet per day (E.C. Jordan, 1988).

Table 4-13
***In-Situ* Hydraulic Conductivity (K) at SWMU 2**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU	Well/Piezometer	Runs	Range of K (feet/day)	Median K (feet/day)	Average K (feet/day)	Screen Interval (feet bis)
2	MPT2-P5	6	5.049 - 5.985	5.507	5.507	5 - 11

Note: Runs are slug-test data retrieval events.
bis = below land surface.

Groundwater Gradient and Flow Velocity. Water table elevations were measured on February 16, March 25, and April 20, 1992, for selected piezometers and monitoring wells throughout NAVSTA Mayport. Groundwater measurements were obtained specifically from one piezometer and four monitoring wells at or near SWMU 2. The measurements were achieved within a 4-hour period during each measurement event. Table 4-14 presents the water table measurements at SWMU 2 for these three measurements.

Facility-wide water table surface maps were developed for each monthly measurements event to provide a synoptic view of the water table surface throughout NAVSTA Mayport. Because no significant monthly variation was observed on a facility-wide basis (the coefficient of variation of groundwater elevations was less than 1), an average water table surface map was developed using the measurements from all three groundwater elevation survey events. The estimated water table surface map for SWMU 2 using both SWMU-specific and facility-wide synoptic data is presented in Figure 4-23.

Well logs, water table elevations, and general water quality characteristics at the well cluster composed of MPT-2-9S and MPT-2-9D indicate that the water table is perched in the area of SWMU 2. This condition will be confirmed with additional water table measurements collected on a monthly basis for a year and will be used to assess the affects of the perched condition on groundwater flow characteristics, as appropriate.

Table 4-14
Summary of SWMU 2 Water Level Data

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Well/Piezometer	X Easting State Plane ¹	Y Northing State Plane ¹	Z Elev. (MSL)	Water Level 02/16/92			Water Level 03/25/92			Water Level 04/20/92			Avg. Elev. ² (MSL)	Depth Standard Deviation ³		
				Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)				
MPT-2-5	365958.465	2200114.406	9.91	01:49 pm	3.38	6.53	6.53	02:50 pm	3.35	6.56	6.56	05:45 pm	3.49	6.42	6.50	0.06
MPT-2-P5	366452.771	2201086.692	7.15	01:59 pm	4.58	2.57	2.57	02:29 pm	4.65	2.50	2.50	04:25 pm	4.30	2.85	2.64	0.15
MPT-2-10	366391.758	2200333.638	10.02	02:05 pm	3.60	6.42	6.42	02:35 pm	3.41	6.61	6.61	06:20 pm	3.94	6.08	6.37	0.22
MPT-2-9S	366127.368	2200345.514	10.50	02:07 pm	4.19	6.31	6.31	02:40 pm	4.22	6.28	6.28	06:10 pm	4.55	5.95	6.18	0.16
MPT-2-9D	366127.723	2200338.658	10.49	02:10 pm	7.58	2.91	2.91	02:40 pm	7.87	2.62	2.62	06:12 pm	7.81	2.68	2.74	0.12

¹Florida State Plane Coordinate System.

²Arithmetic average of all water level measurements for each well.

³Standard deviation of all water level measurements for each well.

Notes: Elev. = elevation.

MSL = mean sea level.

LCL = local.

TOC = top of casing as datum.

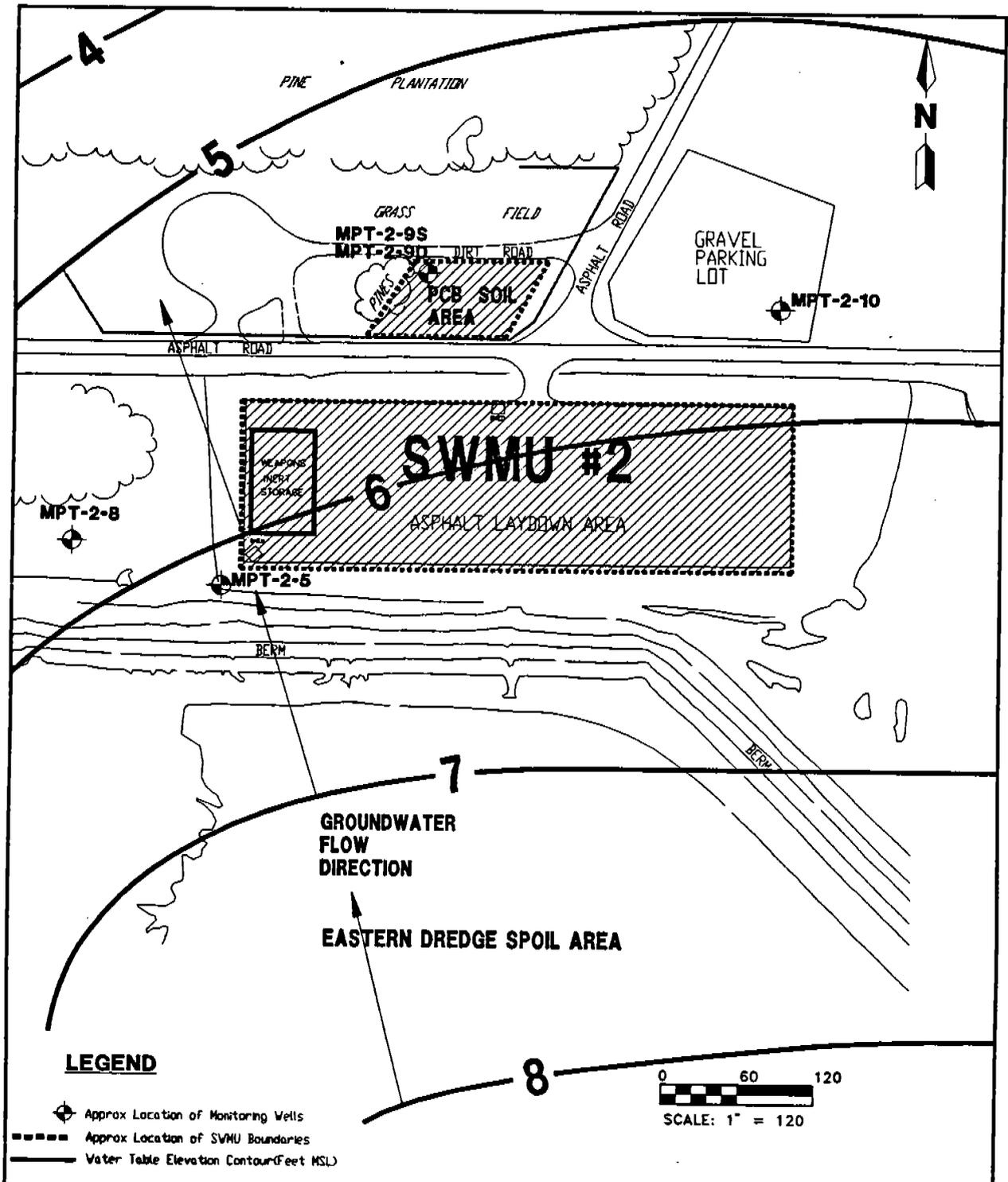


FIGURE 4-23
SWMU 2 - LANDFILL B
WATER TABLE SURFACE MAP



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Selected NAVSTA Mayport groundwater wells and piezometers were monitored over a 48-hour period in February 1992 to observe possible influences from tidal effects. Wells located away from tidally influenced water bodies (greater than 100 feet) were minimally affected by tidal fluctuations. Groundwater response in these wells was weak to non-existent. Tidal influence on the water table aquifer at SWMU 2 is minimal based on these observations because the closest tidally influenced surface water is greater than 100 feet from the site.

Average groundwater velocities were calculated based on Darcy's Law using estimates of porosity, permeability, and aquifer gradients (based on synoptic water table elevations) obtained from the field and laboratory observations. Table 4-15 summarizes the parameters and estimated velocities. Groundwater appears to flow northward towards the perimeter road drainage ditch. The hydraulic gradient is uniform over SWMU 2 and the average velocity is approximately 0.07 foot per day. Additional water table measurements will be collected on a monthly basis for a year and will be used to assess the affects of possible perched conditions on SWMU 2 groundwater flow characteristics.

Table 4-15
Estimation of Average Groundwater Velocities at SWMU 2
Based on Darcy's Law

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Location	Estimated Effective Porosity	Hydraulic Conductivity (feet/day)	Estimated Gradient ¹ (feet/feet)	Calculated Average Velocity (feet/day)	Estimated Average Velocity (feet/day)
MPT-2-5	0.25	5.72 ²	0.0033	0.0684	0.07
MPT-2-10	0.25	5.5 ³	0.0033	0.0726	0.07
MPT-2-9S	0.25	5.5 ³	0.0033	0.0726	0.07
MPT-2-9D	0.25	5.5 ³	0.0033	0.0726	0.07

¹ Based on estimated synoptic water table elevations.

² Measured during the Expanded Site Inspection, October 1987 (E.C. Jordan, 1988).

³ Estimated from in-situ conductivity measurement at MPT-2-P-5 during Phase 1 RFI, February 1992.

4.5.5 Release Characteristics This section describes the extent of contamination observed at SWMU 2, Landfill B, during the Phase 1 RFI. Field activities and findings described in this section of the report include surface soil and groundwater investigations.

Groundwater samples were analyzed as specified in the RFI Workplan for organic and inorganic constituents by USEPA SW-846 Methods 8240 (VOCs), 8270 (SVOCs), 8080 (organochlorine pesticides and PCBs), 6010 (metals by inductively coupled plasma [ICP]), 7420 (metals by graphite furnace atomic absorption [GFAA]), 7470 (metals by Cold Vapor Atomic Absorption [CVAA]), or 9010 (cyanide). Surface soils samples were analyzed by USEPA Method 8080 PCBs.

The laboratory data for the selected Appendix IX analyses were validated in accordance with NEESA Level C requirements (NEESA, 1988) to determine data of known quality for site characterization and risk assessment. The data were either accepted without qualification, accepted as estimated values, or rejected. Chapter 3.0 discusses the data validation findings and data validation narratives are presented in Volume II, Appendix E.

Groundwater samples were also analyzed in the laboratory for the following general water quality parameters: TDS, chloride, alkalinity (as CaCO_3), hardness (as CaCO_3), sulfate, sulfide, TKN, ammonia (total), nitrite/nitrate, total phosphorous, total organic carbon (TOC), oil and grease, color, and pH. Analyses were conducted in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983). These are non-CLP methodologies, and general water quality samples were collected and analyzed in accordance with NEESA Level E guidelines (NEESA, 1988).

Surface Soil Sample Results. Surface soil samples were collected in a grid pattern near MPT-2-9S and analyzed for PCBs by USEPA Method 8080. Aroclor 1260 was the only congener of PCB found above detection limits in any of the laboratory analyzed samples from the PCB soil area (Figure 4-21) north of SWMU 2. Sample results are presented in Table 4-16. The highest concentration was 120 mg/kg at sample location D4 at the 0 to 6-inch bls interval (Figure 4-21). PCB concentrations were found in the upper interval along a northwest trend toward sample location A1. A1 had the second highest observed concentration of 68 mg/kg. Concentrations decreased to about 1 mg/kg or less towards the west, south, and east edges of the sample grid.

Collocated samples at the interval of 6 to 12-inches bls had significantly lower concentrations of PCBs. For example, the deeper sample at D4 had 0.75 mg/kg PCB versus 120 mg/kg at the surface. This general pattern was observed in most samples. Exceptions occurred at E6, G4, and H4 where the deeper samples had higher PCB concentrations than their corresponding surface sample.

Sampling at the PCB soil area confirmed existence of surface soil contamination with PCBs. Additional sampling is necessary to determine the horizontal extent of the PCBs. Specifically, the existing sampling grid should be extended to the north and west until sufficient surface soil samples have been collected to establish the boundary of the contamination.

PCB contamination appears to be contained principally in the upper 6 inches of the soil. The majority of the collocated samples collected at the 6- to 12-inch depth were orders of magnitude lower than their corresponding surface sample concentration. The majority of samples collected at the lower interval were near or below 1 mg/kg. Exceptions to the vertical trend in PCB concentrations occurred at E6, G4, and H4 where higher concentrations were found at depth. Within the context of the entire data set, these sample results indicate possible sampling error due to cross contamination between sample intervals. The soils at the site were composed of coarse shell fragments and sand, and sloughing from the side walls during subsurface soil sampling was difficult to avoid. However, future sampling should be accomplished to confirm the vertical extent of PCB contamination.

Table 4-16
SWMU 2 Polychlorinated Biphenyls (PCB) Sample Results¹

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Location	Easting ²	Northing ²	Concentrations at Depth Interval:	
			0-6 inches	6-12 inches
D4	366133.5336	2200338.4830	120	0.75
A1	366116.2440	2200368.3793	68	1.60
C3	366127.9010	2200348.3196	42	
D3	366138.5733	2200348.3196	36	
C1	366137.2022	2200367.4031	26	0.20
E2	366152.9142	2200358.1294	16	
G1	366177.0380	2200366.5454	11	
B1	366127.0858	2200367.6711	7.9	0.83
F3	366158.5097	2200348.5876	7.4	0.007
E5	366139.1662	2200329.2092	5.0	0.035
D2	366143.0942	2200358.1294	4.2	0.053
I3	366188.0068	2200348.3196	3.1	
G2	366172.8506	2200358.1294	1.2	
I1	366196.3081	2200366.3533	1.1	0.006
E6	366133.8301	2200318.2737	0.40	0.44
H6	366163.8459	2200317.4160	0.36	0.020
I2	366192.4906	2200358.1294	0.35	0.009
G4	366163.8459	2200338.7510	0.33	2.30
C6	366113.5972	2200318.8366	0.26	0.037
G6	366154.0259	2200317.7108	0.26	0.015
B4	366113.0413	2200338.7510	0.23	0.073
H4	366174.2588	2200338.7510	bdl	0.019

¹Aroclor 1260.

²State Plane Coordinate System.

Notes: Concentrations reported in milligrams per kilogram.
 bdl = below detection limit.

Groundwater Sample Results. Groundwater samples were collected from four existing monitoring wells located at SWMU 2. These the wells had been installed previously during the ESI (E.C. Jordan, 1988). Groundwater in the unconfined surficial aquifer at Mayport is classified Class G-II as defined by Chapter 17-3.403, FAC. Class G-II groundwater is potable-use groundwater in aquifers that have TDS contents of less than 10,000 mg/l, unless otherwise classified. G-II groundwater should meet primary and secondary drinking water quality standards as listed in Chapters 17-550.310 and 550.320, FAC. TDS, as measured by a gravimetric method (USEPA Method 160.1), ranged from 1,380 mg/l in sample MPT-2-MW-5-1 to 32,000 mg/l in sample MPT-2-MW9D-1. Table 4-17 presents the concentrations of major general water quality parameters measured in SWMU 2 groundwater samples.

**Table 4-17
General Water Quality for SWMU 2 Groundwater Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

USEPA Method	Analyte	Unit	Concentrations Samples From:			
			MPT-2-MW5-1	MPT-2-MW9S-1	MPT-2-MW9D-1	MPT-2-MW10-1
160.1	Total Dissolved Solids	mg/l	1,380	8,340	32,000	13,000
325.1	Chloride	mg/l	141	4,010	34,400	14,400
376.1	Sulfide	mg/l	0.3	4	5.8	4.2
375.4	Sulfate	mg/l	482	362	20.8	3

Note: USEPA = U.S. Environmental Protection Agency.
mg/l = milligrams per liter.

General water quality of the surficial aquifer at SWMU 2 is characterized by saline conditions as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely or limited at best. Although the surficial aquifer is classified G-II, secondary standards (Chapter 17.550.320, FAC) are exceeded in most of the surficial wells for TDS and chloride. Maximum contaminant levels as specified in Chapter 17.550.320, FAC, for TDS and chloride are 500 and 250 mg/l, respectively. Approximate median values in the unconfined surficial aquifer in SWMU 2 for TDS and chloride are approximately 1,950 and 6,970 mg/l, respectively (TDS is biased low if compared to an ion balance). Reducing conditions were also evident from the presence of sulfide in the surficial aquifer. Anaerobic conditions and the presence of sulfide in the surficial aquifer would reduce the mobility of metal contaminants if present.

Tables 4-18 and 4-19 summarize the validated data results for potential chemicals-of-concern detected above quantitation limits in the SWMU 2 groundwater samples. Figure 4-24 also presents sample locations and laboratory results. No SVOCs, pesticides, or PCBs were detected in any groundwater samples. A small number of VOCs were measured in two groundwater samples. Inorganic compounds (arsenic, barium, chromium, lead, nickel, vanadium, zinc, and cyanide) were

**Table 4-18
Detected Organic Chemicals in SWMU 2 Groundwater Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:		20877	20877	20866	20866	20866	20877					
Sample Matrix:		Water		Water		Water						
Location/Sample No.:		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		
Date Sampled:		02/10/92		02/10/92		02/09/92		02/09/92		02/10/92		
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
75-15-0	Carbon disulfide	µg/l							2	J	1	J
78-93-3	2-Butanone	µg/l							9	J		

Notes: Laboratory data validated with NEESA Level C criteria.
 Conc. = concentration.
 Qual. = qualifier.
 µg/l = micrograms per liter.
 "J" = estimated value.

Table 4-19
Detected Inorganic Chemicals in SWMU 2 Groundwater Samples

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Delivery Group:		20877	20877	20866	20866	20877
Sample Matrix:		Water	Water	Water	Water	Water
Location/Sample No.:		MPT-2-MW5-1	MPT-2-MW5-1D	MPT-2-MW9S-1	MPT-2-MW9D-1	MPT-2-MW10-1
Date Sampled:		02/10/92	02/10/92	02/09/92	02/09/92	02/10/92
CAS RN	Common Name	Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
	Units					
7440-38-2	Arsenic				19.1	5
7440-39-3	Barium	33.9	34	8.7	27	29.1
7440-47-3	Chromium	J	J	J	J	J
7440-92-1	Lead				3.2	
7440-02-0	Nickel		8	4.8	8.8	
7440-31-05	Tin		22.2			
7440-62-2	Vanadium	4.8	4.7	4.1	3.7	8
7440-66-6	Zinc	4.3	4.3			4.1
5955-70-0	Cyanide			6.9	306	2.6

Laboratory data validated with NEESA Level C criteria.

Notes: Conc. = concentration.

Qual. = Qualifier.

µg/l = micrograms per liter.

"J" Qualifier indicates estimated value.

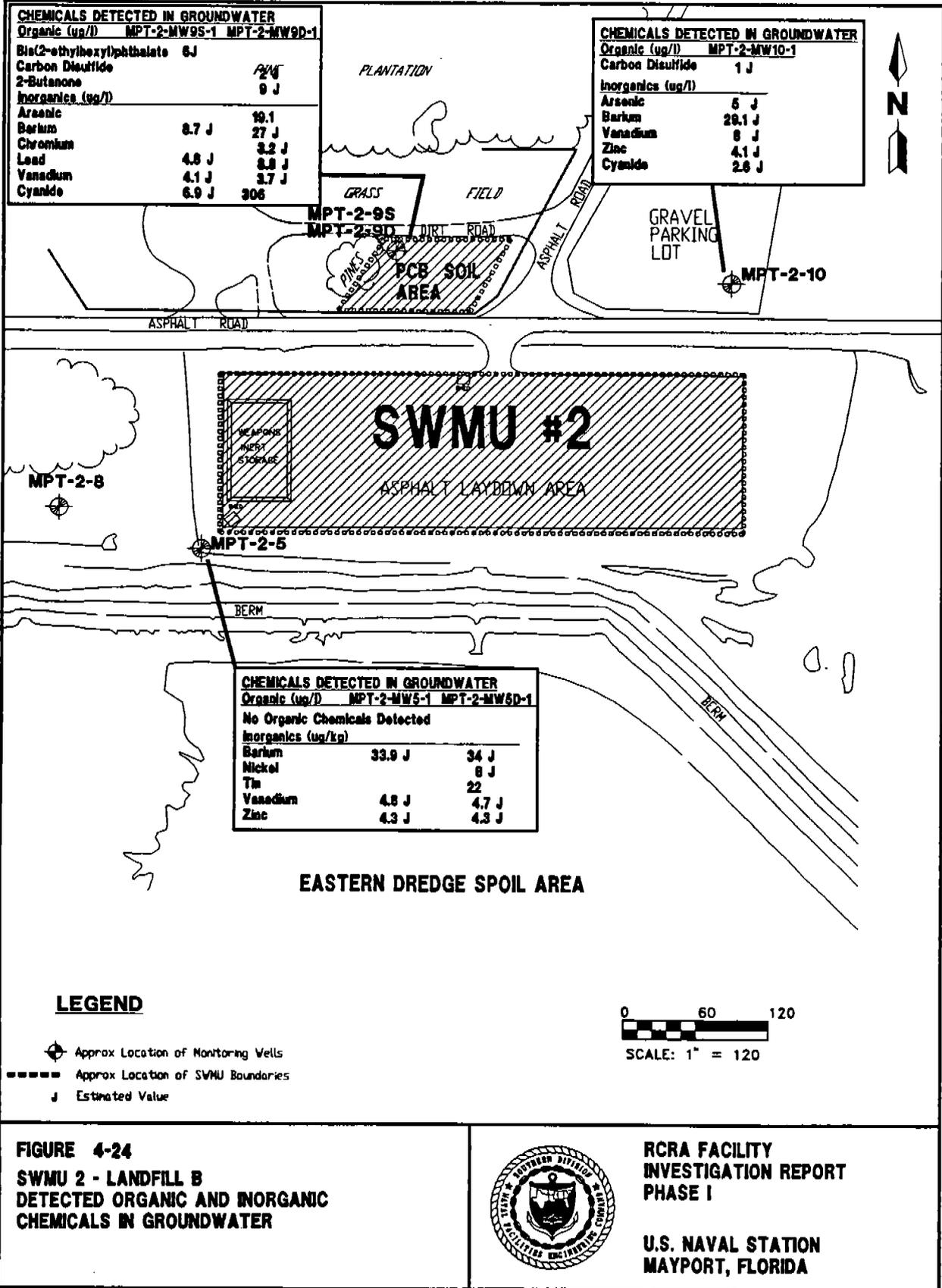


FIGURE 4-24
SWMU 2 - LANDFILL B
DETECTED ORGANIC AND INORGANIC
CHEMICALS IN GROUNDWATER



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detected at low concentrations in groundwater samples. Samples for metals were collected without filtration and were preserved immediately after collection with acid. The metal results are, therefore, total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions.

Carbon disulfide was detected at low concentrations in two groundwater samples. The groundwater samples MPT-2-MW9D-1 and MPT-2-MW10-1 reported estimated concentrations of 2 $\mu\text{g}/\text{l}$ and 1 $\mu\text{g}/\text{l}$, respectively. The VOC 2-butanone was reported at an estimated concentration of 9 $\mu\text{g}/\text{l}$ in groundwater sample MPT-2-MW9D-1. No other VOCs, SVOCs, pesticides, or PCBs were reported in any other groundwater sample from SWMU 2.

The following metals were detected in samples collected from SWMU 2.

- Arsenic ranged from an estimated concentration of 5 $\mu\text{g}/\text{l}$ in sample MPT-2-MW10-1 to 19.1 $\mu\text{g}/\text{l}$ in sample MPT-2-MW9D-1.
- Estimated barium concentrations ranged from 8.7 $\mu\text{g}/\text{l}$ in sample MPT-2-MW9S-1 to 33.9 $\mu\text{g}/\text{l}$ in sample MPT-2-MW5-1.
- Chromium was estimated in sample MPT-2-9D-1 at 3.2 $\mu\text{g}/\text{l}$.
- Lead concentrations were estimated at 4.8 $\mu\text{g}/\text{l}$ in sample MPT-2-MW9S-1 to 8.8 $\mu\text{g}/\text{l}$ in sample MPT-2-MW9D-1.
- Nickel was estimated in sample MPT-2-MW5-1D (duplicate of MPT-2-MW5-1) at a concentration of 8 $\mu\text{g}/\text{l}$. Nickel was not detected in sample MPT-2-MW5-1.
- Tin was measured in sample MPT-2-MW5-1D (duplicate of MPT-2-MW5-1) at 22.2 $\mu\text{g}/\text{l}$. Tin was not detected in sample MPT-2-MW5-1.
- Estimated vanadium concentrations ranged from 3.7 $\mu\text{g}/\text{l}$ in sample MPT-2-MW9D-1 to 8 $\mu\text{g}/\text{l}$ in sample MPT-2-MW10-1.
- Estimated zinc concentrations ranged from 4.1 $\mu\text{g}/\text{l}$ in sample MPT-2-MW10-1 to 4.3 $\mu\text{g}/\text{l}$ in sample MPT-2-MW5-1 and its duplicate, MPT-2-MW5-1D.
- Cyanide ranged from an estimated concentration of 2.6 $\mu\text{g}/\text{l}$ in sample MPT-2-MW10-1 to 306 $\mu\text{g}/\text{l}$ in sample MPT-2-MW9D-1.

The data do not indicate apparent groundwater contamination at SWMU 2. Cyanide was measured at 306 $\mu\text{g}/\text{l}$ in sample MPT-2-MW9D-1 which is above the Florida Primary Drinking Water Standard (FPDWS) MCL of 200 $\mu\text{g}/\text{l}$. This sample also had the highest TDSs measured in the SWMU 2 area (32,000 mg/l). Nonetheless, the cyanide detection in this sample is a localized, unique occurrence that does not indicate a systematic pattern of release of Appendix IX inorganic constituents into groundwater at SWMU 2.

4.6 SWMU 3, LANDFILL D.

4.6.1 SWMU 3 Description Historic information on the permitted SWMUs at NAVSTA Mayport had been consolidated in the Initial Assessment Study (IAS) in 1986. The IAS was conducted under the Navy's earlier NACIP program that addressed the

CERCLA of 1980. The following information on the disposal activities at SWMU 3, Landfill E, was obtained from this study (ESE, 1986).

SWMU 3 was a former landfill that operated from 1963 to 1965. The site is located southwest of SWMU 2 and extends under the northwestern corner of the eastern dredge spoil area. SWMU 3 occupies approximately 3 acres and consisted of several pits (eight are estimated) constructed by dragline. Each pit was approximately 40 feet by 40 feet and 8 feet deep, and intersected the water table. Items were dumped into standing water contained in the pits. Disposed waste included waste oil, mercury, solvents, asbestos, acids, pesticide containers, sanitary wastes, and construction rubble.

4.6.2 Summary of Previous Investigation Soil and groundwater samples were collected and analyzed for Priority Pollutant List compounds during the ESI in 1987 (Figure 4-25). No VOCs were detected in groundwater samples obtained from SWMU 3. The SVOCs bis(2-ethylhexyl) phthalate (15 $\mu\text{g}/\ell$) and 2,4-dimethylphenol (13 $\mu\text{g}/\ell$) were detected in groundwater. No PCBs or pesticides were detected in groundwater. PCB (Aroclor 1260) was detected in the soil boring sample from MPT-2-6 at 990 $\mu\text{g}/\text{kg}$. A groundwater sample from monitoring well MPT-2-8 contained total cadmium at 0.9 $\mu\text{g}/\ell$ and total lead at 160 $\mu\text{g}/\ell$.

4.6.3 Summary of Exploration and Sampling Program The exploration program at SWMU 3 included the following data-gathering activities:

- installation of one shallow monitoring well screened from 2 to 12 feet and one deep double-cased monitoring well screened from 90 to 100 feet,
- sampling of subsurface soil during borehole construction for the new shallow monitoring well,
- sampling and analyzing groundwater at two new and two existing monitoring wells,
- sampling and analyzing sediment and surface water samples collected from an invert of the storm drain conveyance system,

Table 4-20 summarizes the type, frequency, and media of samples collected at SWMU 3 during the Phase 1 RFI and as summarized in Chapter 3.0 of this report. The locations of these exploration and sampling activities at SWMU 3 are presented in Figure 4-26. The data gathering activities were composed of the field activities described below. Field activities followed the SOPs in project-specific Technical Memoranda located in Appendix B, Site-Specific QAP of the RFI Workplan, Volume II (U.S. Navy 1991b). Sample-gathering activities within SWMU 3 included sampling soil adjacent to the water table during the installation of monitoring well MPT-2-MW16S and later sampling groundwater from the same well. Surrounding monitoring wells and piezometers were used to supplement local and regional data on groundwater flow rate and direction.

Drilling and Subsurface Soil Sampling. Drilling and subsurface soil sampling were accomplished as described in the Technical Memorandum, Drilling and Subsurface Soil Sampling, Appendix B (U.S. Navy, 1991b). Borehole locations are shown in Figure 4-26. This boring and well installation is also contiguous with SWMU 4. Soil samples were analyzed by the USEPA SW-846 methods. Selected physical

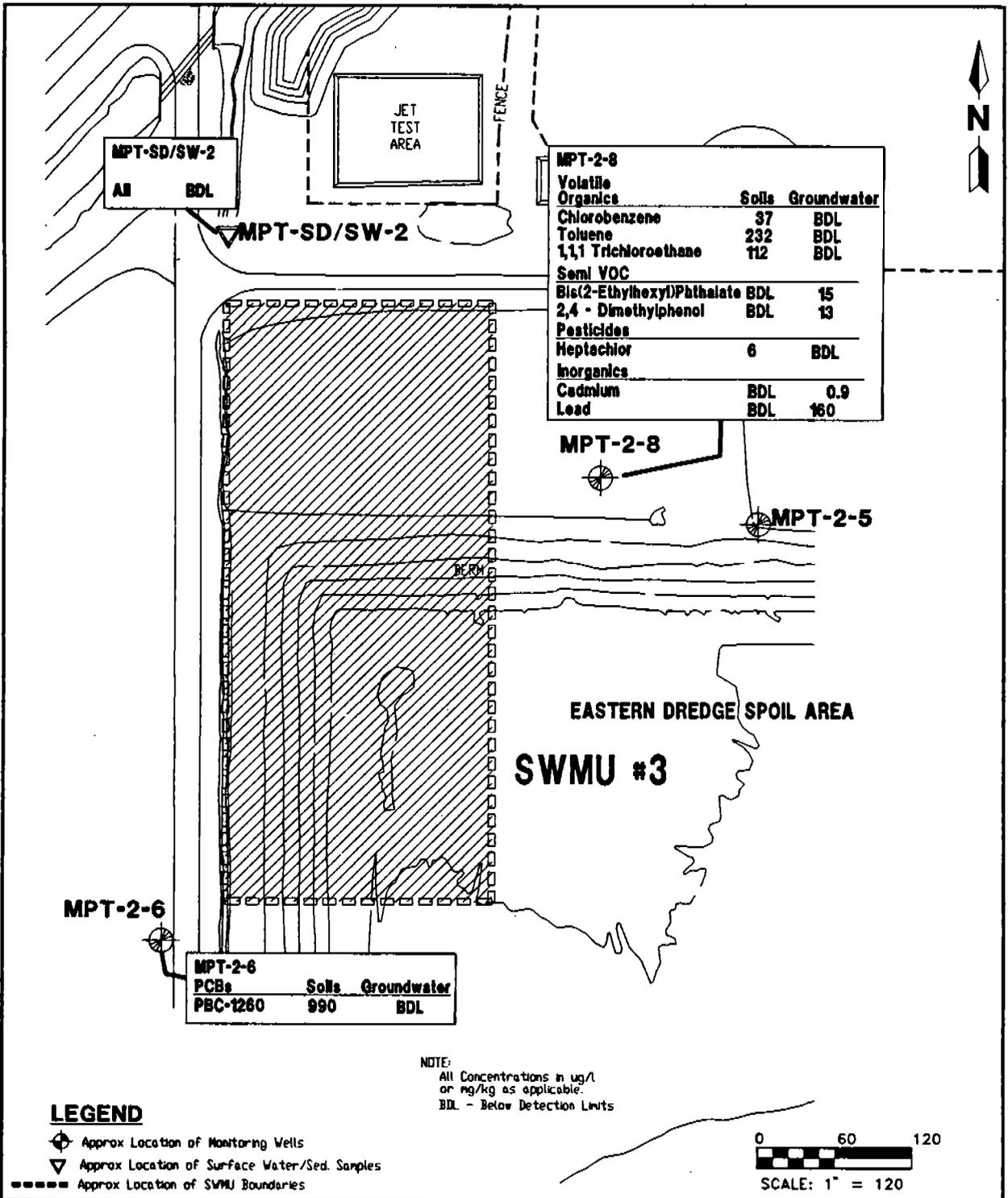


FIGURE 4-25
SWMU 3 - LANDFILL D
EXPANDED SITE INVESTIGATION (ESI) FINDINGS



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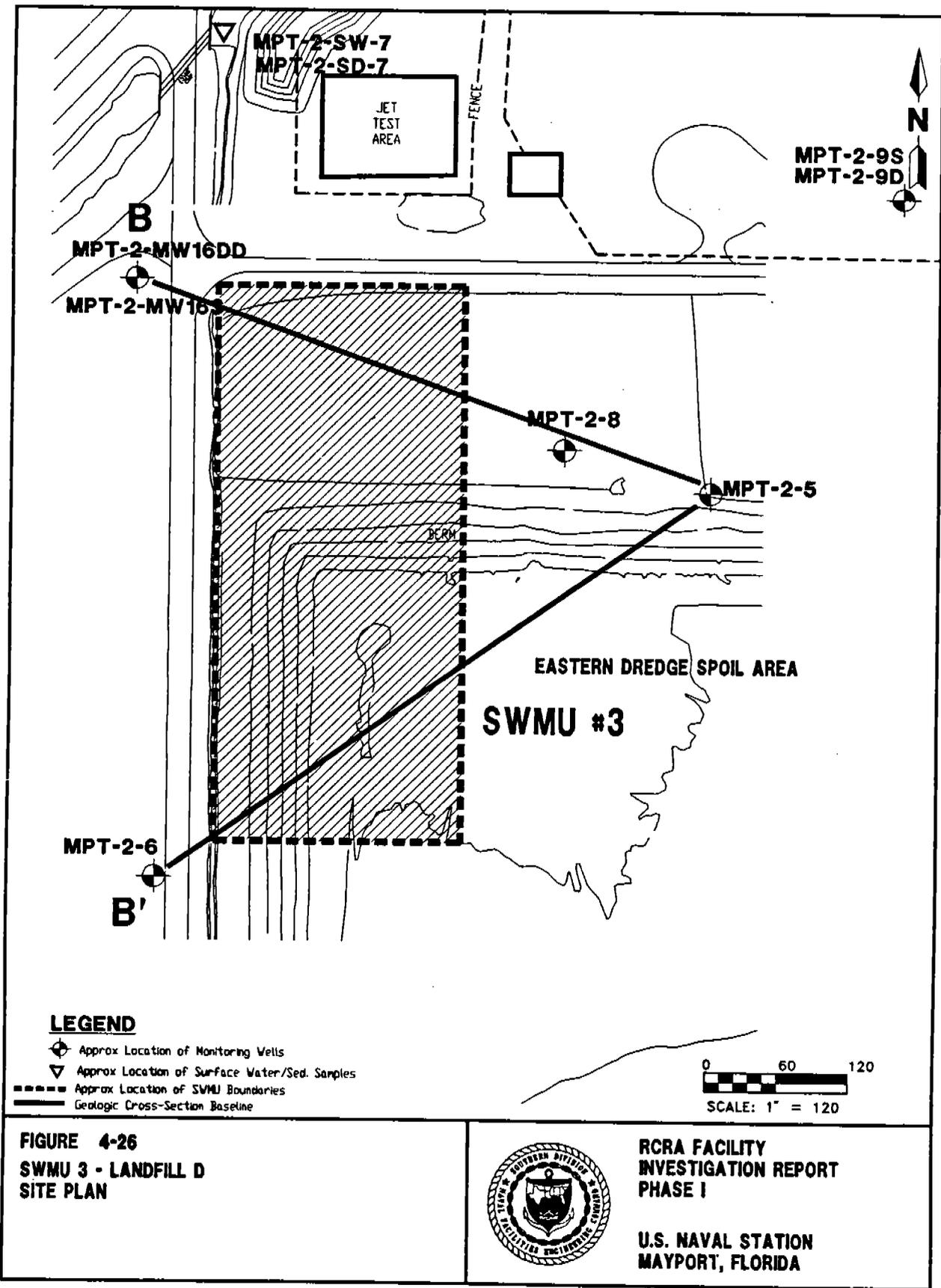


FIGURE 4-26
SWMU 3 - LANDFILL D
SITE PLAN



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**Table 4-20
Summary of SWMU 3 Chemical Analyses**

Phase 1 RCRA Facility Investigation
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Mayport, Florida

Sample Source	Media	U.S. Environmental Protection Agency SW-846 ¹						Totals
		Method 8240 VOC	Method 8270 SVOC	Method 6010, 7470, 7480 Metals	Method 8080 Pest/PCB	General Parameters (soil)	General Water Quality	
SWMU 3	Sediments ²	2	2	2	2	0	0	8
	Groundwater ²	4	4	4	4	0	4	20
	Surface water	2	2	2	2	0	2	10

¹ Selected Appendix IX Groundwater Monitoring List Compounds as analyzed by method indicated.

² Includes field duplicate samples.

Notes: VOC = volatile organic compounds.
SVOC = semivolatile organic compounds.
Pest/PCB = organochlorine pesticides and polychlorinated biphenyls.
SWMU = solid waste management unit.

parameters were also measured and included: bulk density (ASTM D2937-83), cation exchange capacity (USEPA Method 9081), organic content (USEPA Method 9060), soil pH (USEPA Method 9045) particle size distribution (ASTM D422-63) and moisture content (ASTM D2216-80).

Well Construction and Development. One new surficial aquifer monitoring well and one new deep cased well were installed during Phase 1 field activities at SWMU 3. Table 4-21 summarizes the inventory and construction specifications of the monitoring wells installed at SWMU 3 during the Phase 1 RFI and ESI. Well construction and development was accomplished as described in the Technical Memorandum, Well Construction and Development, Appendix B, of the RFI Workplan, Volume II (U.S. Navy, 1991a). Well construction details are presented in Appendix A, Volume II of this report. The well locations are presented Figure 4-26.

Table 4-21
Summary of SWMU 3 Piezometer and Monitoring Well Installations

Phase 1 RCRA Facility Investigation NAVSTA Mayport Mayport, Florida					
SWMU Number	Piezometer and Monitoring Well No.	Phase	Diameter (inches)	Total Depth (feet)	Screened Interval (feet bls)
3	MPT-2-6	ESI	2	10	3 - 10
	MPT-2-8	ESI	2	10	3 - 10
	MPT-2-MW16DD	Phase 1 RFI	4	100	90 - 100
	MPT-2-MW16S	Phase 1 RFI	2	12	2 - 12

Notes: SWMU = solid waste management unit.
bls = below land surface.

ESI = Expanded Site Investigation; E.C. Jordan; conducted September 1987 to October 1987.

Phase 1 RFI = Phase 1 RCRA Facility Investigation; ABB Environmental Services; conducted January 1992 to March 1992.

Groundwater Sampling. Groundwater sampling was accomplished as described in the Technical Memorandum, Groundwater Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b). A total of four groundwater samples were collected, one from each of the existing and new monitoring wells. Samples were analyzed by USEPA SW-846 methods. Selected general water quality parameters were also in measured accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983).

Sediment and Surface Water Sampling. One sediment and surface water sample was collected from the drainage system at SWMU 3. The sediment and surface water sampling location is shown in Figure 4-26. Sediment and surface water sampling was accomplished as described in the Technical Memorandum, Sediment and Surface Water Sampling, Appendix B in the RFI Workplan, Volume II (U.S. Navy, 1991b) and as summarized in Chapter 3.0 of this report.

4.6.4 Environmental Setting Subsurface soil, sediment, surface water, and groundwater are the media of concern at SWMU 3 based on the release scenario described above and analytical results from the ESI. This section summarizes the

geological and hydrogeological factors affecting contaminant fate and migration in these media at SWMU 3.

4.6.4.1 **Geology** This section describes the surficial geologic setting observed at SWMU 3 during the ESI and Phase 1 RFI. The upper surficial sediments consist of material dredged from the Mayport turning basin and the St. Johns River. Beneath these modern deposits are the undifferentiated post-Hawthorn deposits of upper Miocene age and younger that, in turn, overlie the middle Miocene age Upper Hawthorn Group as determined from deep borings MPT-2-MW-16DD and MPT-2-MW-17DD (Leve, 1966). These deep borings are located to the west and southwest of SWMU 3. Physical characteristics of soils measured at SWMU 3 that affect contamination migration are also presented in this section.

Geological Setting. Figure 4-27 shows a cross section summarizing the SWMU 3 geology. The cross-section was composed from boring log data from new and existing monitoring wells and piezometers installed at SWMU 3. The cross section illustrates geologic and hydrologic features typical of the Group I SWMUs. The uppermost unit consists of a surficial deposit of material dredged from the Mayport turning basin and the St. Johns River. Typically, beneath the surficial dredge material a uniform, poorly graded, well sorted, sand (SP) with lenses of a very soft grey to dark-grey silty clay (CH, CM) are found. This sand unit, termed in the cross section undifferentiated post-Hawthorn deposits grades at depth into the third unit, the Coosawatchie Formation of the Upper Hawthorn Group (Scott, 1988).

Physical Characteristics of Soil. Facility wide grain-size distribution analyses show that soil samples typically consist of graded fine-grained sand (Table 4-22). Sample MPT-2-16S specific to SWMU 3, consisted of 85 percent fine-grained sand with the remainder being comprised of medium-grained sand (Table 4-22). This sample is classed as SP soil (USCS), consisting predominantly of one grain size, fine, and a low percentage of fines typically comprising the remainder.

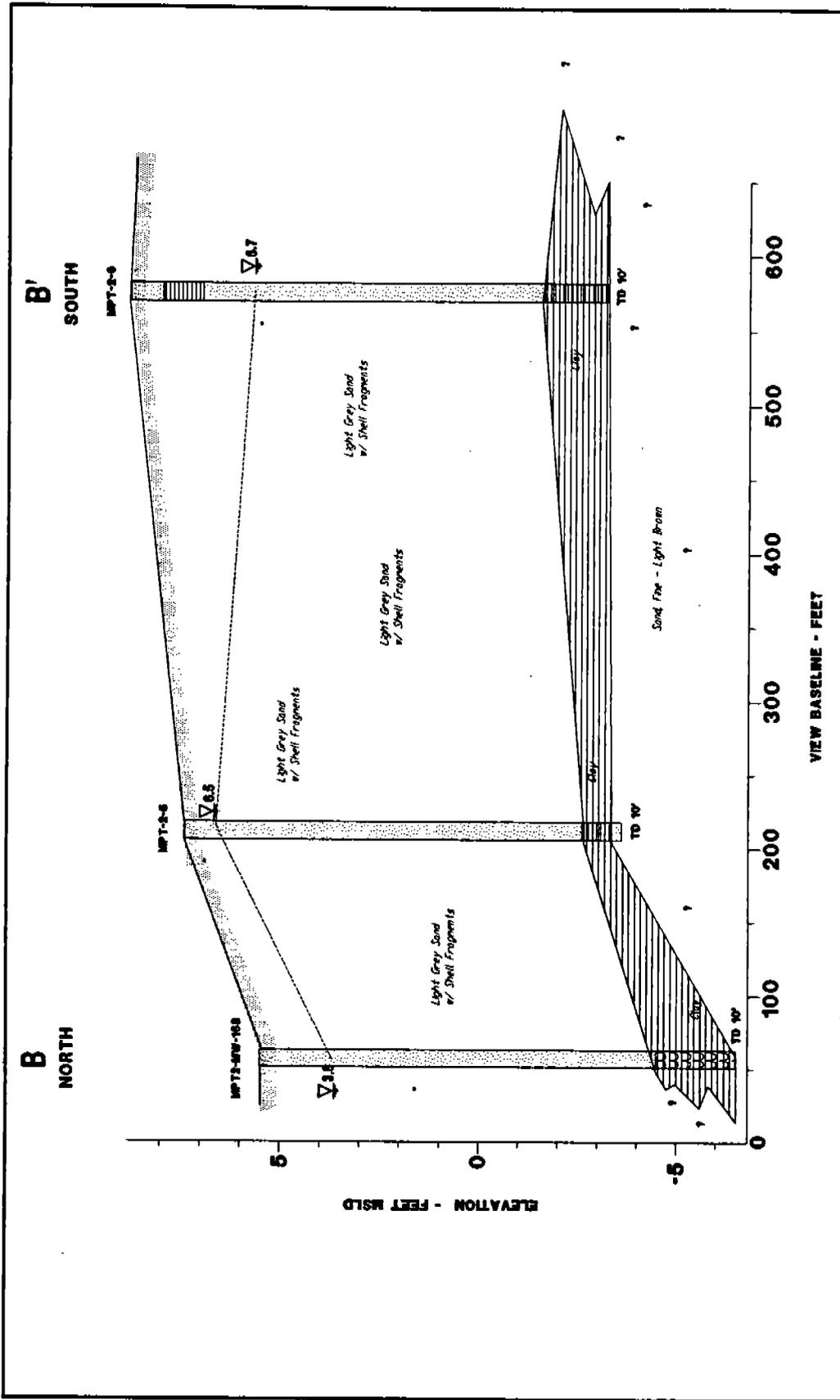
Table 4-22
SWMU 3 Soil Uniformity Coefficient

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample	Percent Sand			Uniformity Coefficient, Cu ¹
	F	M	C	
MPT-2-16S	85	15		1.9

¹ Cu = D₆₀/D₁₀
Cu < 4 = well sorted, poorly graded.
Cu < 6 = poorly sorted, well graded.

Notes: F = fine.
M = medium.
C = coarse.



LEGEND
TO = Total Depth

FIGURE 4-27
SWMU 3 - LANDFILL D
CROSS SECTION B - B'



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Based on the observed particle distribution, an estimated effective porosity range of 0.25 to 0.35 appears reasonable (0.25 is used for the estimation of average groundwater velocities) for the sands of the surficial aquifer at SWMU 3.

The organic content and ion exchange capacity of the soils are relatively low as summarized in Table 4-23. This implies that retardation of contaminants in groundwater flow will be small and, therefore, soluble contaminants will travel at approximately the same velocity as the groundwater.

Table 4-23
SWMU 3 Physical Soil Characteristics

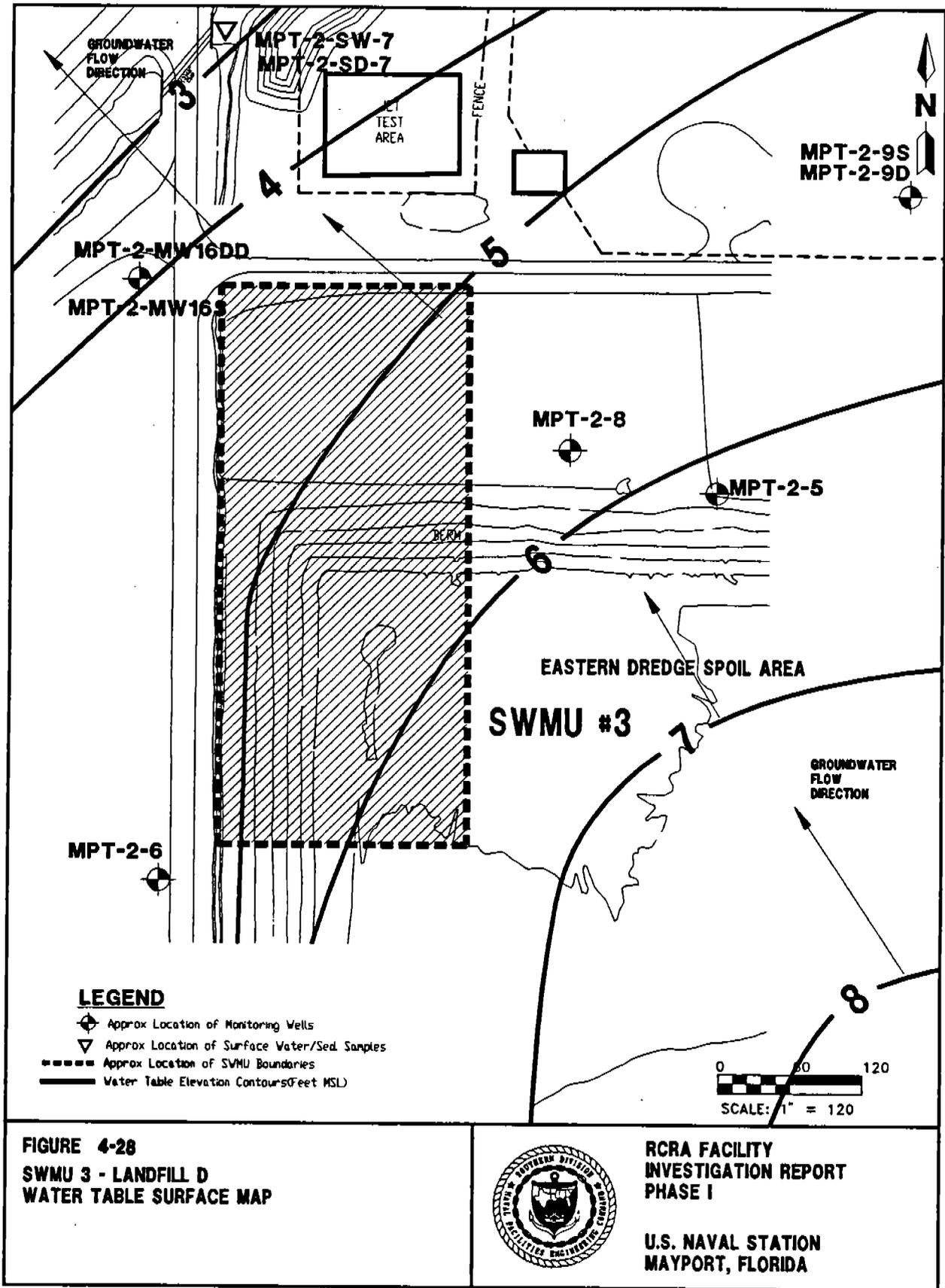
Phase 1 RCRA Facility Investigation NAVSTA Mayport Mayport, Florida	
Sample Matrix:	Soil
Location/Sample No.:	MPT-2-16S
Analyte	
Percent moisture	17.9
Soil bulk density	1.44
Cation exchange capacity	1.4
pH	9.24
TOC	3,480

Notes: Soil bulk density = grams per cubic centimeter.
 Cation exchange capacity = milliequivalents per 100 grams.
 pH = standard units.
 TOC = total organic carbon in milligrams per liter.

Hydrogeology. The hydrogeologic investigations conducted at SWMU 3 during the Phase I RFI collected data to characterize the potentiometric surface of the water table aquifer, estimate the hydraulic conductivities, and compute the average velocity of the groundwater flow in the uppermost aquifer at the site. These parameters were estimated based on synoptic water table elevations, *in-situ* permeability testing (i.e., slug-tests), and soil characteristics of the aquifer formation. Darcy's Law was used to estimate average groundwater flow velocities.

Average Potentiometric Surface. Water table elevations were measured at SWMU 3 monitoring wells and piezometers on February 16, March 25, and April 20, 1992. Potentiometric surface elevations ranged from a high of 6.28 feet above msl in April at MPT-2-8 to a low of 2.9 feet above msl in March at MPT-2-6. Data from near by monitoring wells were provides addition data which generates the potentiometric surface shown on Figure 4-28.

Surficial groundwater flow originates from a localized mound (see Figure 4-4) located to the southeast of SWMU 3 in the eastern dredge spoil area. Flow from the mounded area is to the northwest across SWMU 3 to either a shallow ditch that parallels the munitions area access road located west of and adjacent to SWMU 3



or to a deeper ditch that parallels Perimeter Road. Both ditches ultimately flow to the St. Johns River.

Variations existed in water table elevations in individual wells (Table 4-24). MPT-2-6 rises from 2.9 feet in March to 4.46 feet above msl in April. MPT-2-6 is located approximately 40 feet from an ditch which may effect the local water table elevation. MPT-2-8 falls slightly from 6.45 feet in February to 6.4 feet in March to 6.28 feet msl in April. MPT-2-MW-16S was relatively stable with a minor variation from 3.87 feet in February to 3.81 feet above msl in March. The variations of greater magnitude may occur due to rainfall events followed by infiltration to a localized perched water table. Also these wells are near tidally affected water bodies and may be moderately influenced by tidal effects. MPT-2-MW16DD is screened from 90 to 100 feet bls and reflects the influence of a different aquifer. The potentiometric surface measurements at this well show a rise from 3.13 feet in February to 1.94 feet above msl in March for an average water surface level of 2.54 feet.

Tidal Influence. Data collected from wells located in the interior of NAVSTA Mayport indicate that minimal fluctuation occurs in groundwater levels relative to tidal influences. Groundwater response is weak to non-existent. Correspondingly, wells and piezometers at or near SWMU 3, which is located in the interior, exhibit limited or no response.

Slug Test. Slug tests conducted during a previous investigation (ESE, 1986) of SWMU 3 monitoring wells MPT-2-5 and MPT-2-6 provide an average of the estimated hydraulic conductivities (K) of the aquifer in the vicinity of the screened intervals. These data are presented in Table 4-25 for SWMU 3.

MPT-2-5 had an *in-situ* conductivity of approximately 5.7 feet per day. This monitoring well was screened in the surficial aquifer between 2.5 to 10 feet bls in medium-grained sand grading into clay to clayey sands. MPT-2-6 had a *in-situ* conductivity of approximately 2.8 feet per day. This monitoring well was screened in the surficial aquifer between 2.5 and 10 feet bls in fine-grained silty sand grading into gravel-sized shell fragments (Volume II, Appendix A, Boring Logs).

Groundwater Gradient and Flow Velocity. Average groundwater velocities were calculated based on Darcy's Law using estimates of porosity, permeability, and aquifer gradients (based on synoptic water table elevations) obtained from the field and laboratory observations. Table 4-25 summarizes the parameters and estimated velocities. Flow velocities appear higher in the lower parts of the surficial aquifer due to the higher conductivities measured in the deeper zones.

The average groundwater velocity near SWMU 3 is approximately 0.11 foot per day near MPT-2-MW-5 and MPT-2-MW-6.

4.6.5 Release Characteristics This section describes the extent of contamination observed at SWMU 3, Landfill D, during the Phase 1 RFI. Investigations described in this section of the report include: sediment investigation, surface water investigations, subsurface soil investigation, and groundwater investigation.

Table 4-24
Summary of SWMU 3 Water Level Data

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Well/Piezometer	X Easting State Plane ¹	Y Northing State Plane ¹	Z Elev. (MSL)	Water Level 02/16/92			Water Level 03/25/92			Water Level 04/20/92			Avg. Elev. ² (MSL)	Depth Standard Deviation ³
				Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)		
MPT-2-6	365492.524	2199779.885	9.43	NM	NM	NM	02:06 pm	2.9	6.53	04:30 pm	4.46	4.97	5.75	0.78
MPT-2-MW-16S	365475.365	2200288.986	6.73	12:36 pm	2.86	3.87	03:01 pm	2.92	3.81	12:36 pm	NM	NM	3.84	0.03
MPT-2-MW-16D	365475.209	2200286.791	6.69	12:38 pm	3.56	3.13	02:59 pm	4.75	1.94	12:38 pm	NM	NM	2.54	0.60
MPT-2-8	365838.463	2200144.729	10.55	01:46 pm	4.10	6.45	02:46 pm	4.1	6.40	05:48 pm	4.27	6.28	6.38	0.07

¹Florida State Plane Coordinate System.

²Arithmetic average of all water level measurements for each well.

³Standard deviation of all water level measurements for each well.

Notes: Elev. = elevation.

MSL = mean sea level.

LCL = local.

TOC = top of casing as datum.

NM = not measured.

The samples of environmental media (sediments, surface water, soil, and groundwater) were analyzed for organic and inorganic constituents by USEPA SW-846 Methods 8240 (VOCs), 8270 (SVOCs), 8080 (chlorinated pesticides and PCBs), 6010 (metals by ICP), 7420 (metals by GFAA), 7470 (metals by CVAA), and 9010 (cyanide).

**Table 4-25
Estimation of Average Groundwater Velocities at SWMU 3
Based on Darcy's Law**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Location	Estimated Effective Porosity	Hydraulic Conductivity (feet/day) ¹	Estimated Gradient (feet/feet)	Calculated Average Velocity (feet/day)	Estimated Average Velocity (feet/day)
MPT-2-5	0.25	5.7	0.0064	0.1459	0.15
MPT-2-6	0.25	2.8	0.0064	0.0716	0.07

¹ Measured during the Expanded Site Investigation (1988).

The laboratory data for the selected Appendix IX analyses were validated in accordance with NEESA Level C requirements (NEESA, 1988) to determine data of known quality for site characterization and risk assessment. The data were either accepted without qualification, accepted as estimated values, or rejected. Chapter 3.0 discusses the data validation findings and data validation narratives are presented in Volume III, Appendix E.

Groundwater samples were also analyzed in the laboratory for the following general water quality parameters: TDS, chloride, alkalinity (as CaCO₃), hardness (as CaCO₃), sulfate, sulfide, TKN, ammonia (total), nitrite and nitrate, total phosphorous, TOC, oil and grease, color, and pH. Analyses were conducted in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983). These are non-CLP methodologies, and general water quality samples were collected and analyzed in accordance with NEESA Level E guidelines (NEESA, 1988).

Surface Water Sample Results. Surface water samples were collected the week of January 20, 1992, in accordance with the RFI Workplan (U.S. Navy, 1991a,b) at one location (MPT-2-SW-7 and the duplicate MPT-2-SW-7A). Figure 4-29 presents the surface water sample location and analytical results. Table 4-26 summarizes the detected chemicals in the SWMU 3 surface water sample. The sample location was chosen to determine whether contaminants from SWMU 3 were migrating off-site via the surface water conveyance system.

Surface water around Mayport south of the St. Johns River is classified as Class III Waters for Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife (Chapter 17-302.560, FAC). A bar-chart summary of all measured surface water quality parameters for the SWMU 3 surface water sample is presented in Figure 4-30.

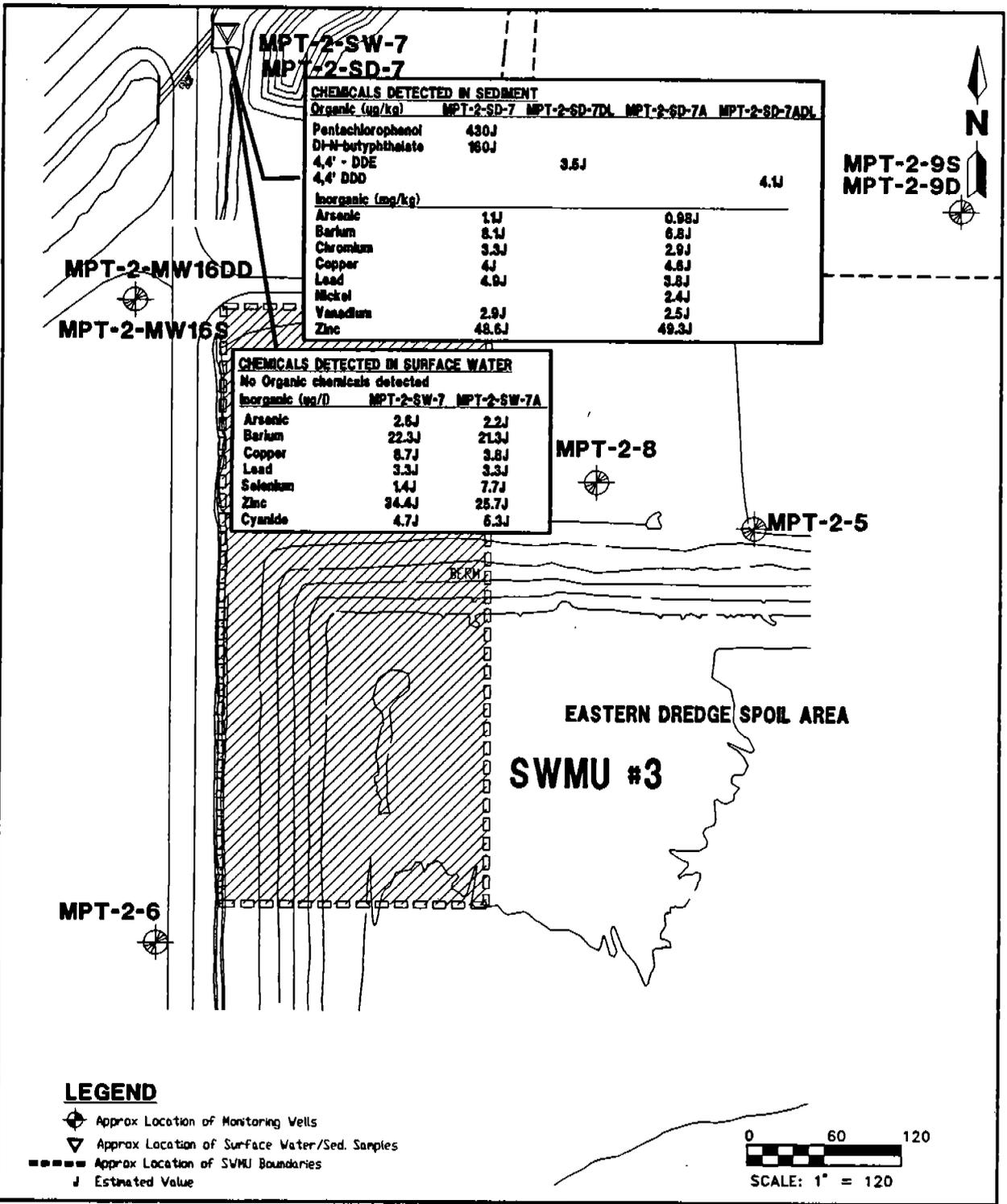


FIGURE 4-29
SWMU 3 - LANDFILL D
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN SEDIMENT AND SURFACE WATER



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**Table 4-26
Detected Inorganic Chemicals in SWMU 3 Surface Water Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20740		20740	
Sample Matrix:			Water		Water	
Location/Sample No.:			MPT-2-SW-7		MPT-2-SW-7A	
Date Sampled:			01/23/92		01/23/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.
7440-38-2	Arsenic	$\mu\text{g}/\text{l}$	2.6	J	2.2	J
7440-39-3	Barium	$\mu\text{g}/\text{l}$	22.3	J	21.3	J
7440-50-8	Copper	$\mu\text{g}/\text{l}$	8.7	J	3.8	J
7440-92-1	Lead	$\mu\text{g}/\text{l}$	3.3	J	3.3	J
7440-49-2	Selenium	$\mu\text{g}/\text{l}$	1.4	J	7.7	J
7440-66-6	Zinc	$\mu\text{g}/\text{l}$	34.4	J	25.7	J
5955-70-0	Cyanide	$\mu\text{g}/\text{l}$	4.7	J	5.3	J
<p>Notes: Laboratory data validated at NEESA Level C. Conc. = concentration. Qual. = qualifier. $\mu\text{g}/\text{l}$ = micrograms per liter. "J" = estimated value.</p>						

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Surface Water Sample Location MPT-2-SW-7

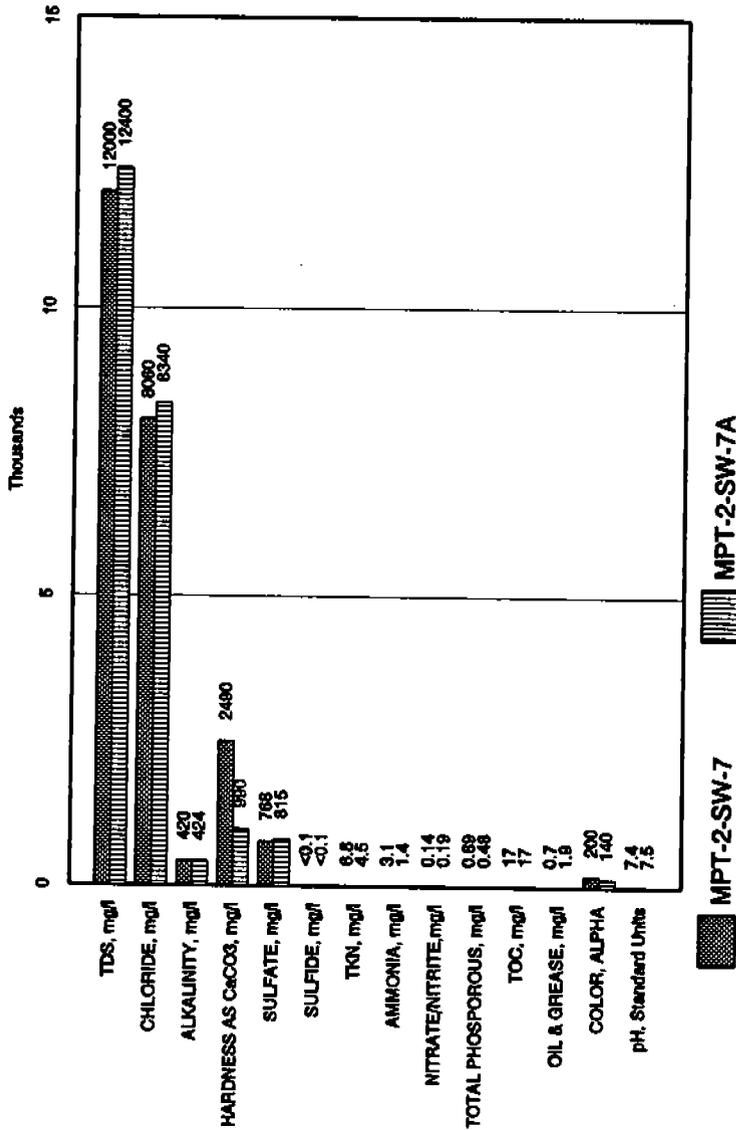


FIGURE 4-30
GENERAL SURFACE WATER QUALITY AT
SAMPLE LOCATION MPT-B-SW-7



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TDS, as measured by a gravimetric method (USEPA Method 160.1), was 12,000 mg/l in sample MPT-2-SW-7 and 12,400 mg/l in sample MPT-2-SW-7A (duplicate of MPT-SW-7). The surface water at SWMU 3 is moderately saline and general water quality is influenced by the estuarine character of Sherman Creek, Pablo Creek, and Chicopit Bay.

Sulfate and chloride were the dominant anions. Sulfate (SO_4^{2-}), a common form of sulfur found in oxygenated conditions, was 768 mg/l in sample MPT-2-SW-7 and 815 mg/l in sample MPT-2-SW-7A. Sulfide (S^{2-}) is a form of reduced sulfur often found under anaerobic conditions. No sulfide was found in either sample above the method detection limit (<0.1 mg/l). Chloride was from 8,060 mg/l in sample MPT-2-SW-7 and 8,340 mg/l in sample MPT-2-SW-7A. The surface waters at SWMU 3 meet the conditions for predominantly marine water as defined in Chapter 17-302.200, FAC (chloride $\geq 1,500$ mg/l).

Alkalinity (as CaCO_3) was 420 mg/l in sample MPT-2-SW-7 and 424 mg/l in sample MPT-2-SW-7A. Hardness (as CaCO_3) was 2,490 mg/l in sample MPT-2-SW-7 and 990 mg/l in sample MPT-2-SW-7A, which is in the "hard" range for natural waters.

Surface water nutrient compounds measured during Phase 1 field activities included nitrogen and phosphorous. Nitrogen species included ammonia (total), TKN, and total nitrites and nitrates. Ammonia was analyzed using USEPA Method 350.2, which reports both un-ionized ammonia and ammonium ion. TKN was measured using USEPA Method 351.3. Nitrite and nitrate nitrogen were measured by USEPA Method 353.2.

Total nitrogen was estimated as the sum of TKN and nitrite and nitrate. Total nitrogen concentrations were 86.94 mg/l (MPT-2-SW-7) and 4.69 mg/l (MPT-2-SW-7A). Ammonia was also detected at 3.1 mg/l (MPT-2-SW-7) and 1.4 mg/l (MPT-2-SW-7A).

Phosphorus was measured by USEPA Method 365.1, which determines total phosphorus including elemental phosphorus, orthophosphorus, and hydrolyzable (organic) phosphorus. Total phosphorus was 0.89 mg/l in sample MPT-2-SW-7 and 0.48 mg/l in sample MPT-2-SW-7A.

TOC was measured by USEPA Method 415.2 as an estimate of the carbonaceous oxygen demand in the surface water. Values were 17 mg/l for both sample MPT-2-SW-7 and sample MPT-2-SW-7A. As a proxy for the more common measure of biological degradable carbonaceous matter in water, BOD_5 , TOC is generally an order of magnitude greater than the corresponding BOD_5 value.

Oil and grease concentrations were measured by USEPA Method 413.1, which is an infrared spectrophotometric technique that measures hydrocarbons, vegetable oil, animal fats, waxes, greases, and other related matter. It is a broad measure of hydrocarbons in water. Oil and grease concentrations were 0.7 mg/l in sample MPT-2-SW-7 and 1.9 mg/l in sample MPT-2-SW-7A.

Color as measured by USEPA Method 110.2 was 200 APHA units in sample MPT-2-SW-7 and 140 APHA units in sample MPT-2-SW-7A. The laboratory-measured pH ranged from 7.4 to 7.5 standard units.

General water quality parameters such as TDS, alkalinity, and hardness indicate that the surface water at SWMU 3 is affected by the estuarine influences of

Sherman Creek, Pablo Creek, and Chicopit Bay. This observation is supported by visual indications that parts of the surface water conveyance system within SWMU 3 are tidally influenced, with changes in surface water elevations ranging from approximately 0 to 4 feet depending on distance upstream from the major estuarine features (KBN, 1992; Appendix C). Water quality at the time of sampling was within Class III criteria for the general parameters measured that had standards (Chapter 17-320.530, FAC).

No VOCs, SVOCs, pesticides, or PCBs were detected in either of the SWMU 3 surface water samples. Samples for inorganic constituents were collected without filtration and were preserved immediately after collection with acid. The metal results are total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions. The following inorganic elements and compounds were measured in the SWMU 3 surface water samples.

- Estimated concentrations of arsenic were detected in both of the SWMU 3 surface water samples with 2.6 $\mu\text{g}/\ell$ in sample MPT-2-SW-7 and 2.2 $\mu\text{g}/\ell$ in sample MPT-2-SW-7A.
- Estimated concentrations of barium were detected in both of the SWMU 3 surface water samples with 22.3 $\mu\text{g}/\ell$ in sample MPT-2-SW-7 and sample 21.3 $\mu\text{g}/\ell$ in sample MPT-2-SW-7A.
- Estimated concentrations of copper in both SWMU 3 surface water samples at 8.7 $\mu\text{g}/\ell$ in sample MPT-2-SW-7 and 3.8 $\mu\text{g}/\ell$ in sample MPT-2-SW-7A.
- Estimated concentrations of lead were detected in the SWMU 3 surface water samples at 3.3 $\mu\text{g}/\ell$ in both sample MPT-2-SW-7 and sample MPT-2-SW-7A.
- Estimated concentrations of selenium were detected in both SWMU 3 surface water samples at 1.4 $\mu\text{g}/\ell$ in sample MPT-2-SW-7 and at 7.7 $\mu\text{g}/\ell$ in sample MPT-2-SW-7A.
- Estimated concentrations of zinc were detected in both SWMU 3 surface water samples at 34.4 $\mu\text{g}/\ell$ in sample MPT-2-SW-7 and at 25.7 $\mu\text{g}/\ell$ in sample MPT-2-SW-7A.
- Estimated concentrations of cyanide were detected in both SWMU 3 surface water samples at 4.7 $\mu\text{g}/\ell$ in sample MPT-2-SW-7 and 5.3 $\mu\text{g}/\ell$ in sample MPT-2-SW-7A.

Only cyanide was measured above the Class III surface water quality standard for marine water in samples MPT-2-SW-7 and MPT-2-SW-7A. These data do not indicate surface water contamination by Appendix IX inorganic constituents due to release of contaminants from SWMU 3.

Sediment Sample Results. Sediment samples were collected the week of January 20, 1992, in accordance with the RFI Workplan (U.S. Navy, 1991a,b) at one location (MPT-2-SD-7 and its duplicates MPT-2-SD-7DL, MPT-2-SD-7A, and MPT-2-SD-7ADL) along with the surface water samples. Figure 4-29 presents the sediment sample location and analytical results. Table 4-27 summarizes the detected chemicals in the SWMU 3 sediment samples. The sample location was chosen to determine

**Table 4-27
Detected Organic and Inorganic Chemicals in SWMU 3 Sediment Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20740		20740		20740		20740	
Sample Matrix:			Sediment		Sediment		Sediment		Sediment	
Location/Sample No.:			MPT-2-SD-7		MPT-2-SD-7DL		MPT-2-SD-7A		MPT-2-SD-7ADL	
Date Sampled:			01/23/92		01/23/92		01/23/92		01/23/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
87-86-5	Pentachlorophenol	µg/kg	430	J						
84-74-2	Di-n-butyl phthalate	µg/kg	160	J						
72-55-9	4,4'-DDE	µg/kg	3.4		3.5	J			4.1	J
72-54-8	4,4'-DDD	µg/kg	1.3	J						
7440-38-2	Arsenic	mg/kg	1.1	J			0.98	J		
7440-39-3	Barium	mg/kg	8.1	J			6.8	J		
7440-47-3	Chromium	mg/kg	3.3	J			2.9	J		
7440-50-8	Copper	mg/kg	4	J			4.6	J		
7440-92-1	Lead	mg/kg	4.9	J			3.8	J		
7440-02-0	Nickel	mg/kg					2.4	J		
7440-62-2	Vanadium	mg/kg	2.9	J			2.5	J		
7440-66-6	Zinc	mg/kg	48.6	J			49.3	J		

Notes: Laboratory data validated with NEESA Level C criteria.
 "DL" = in Location/Sample No. indicates a laboratory dilution.
 Conc. = concentration.
 Qual. = qualifier.
 µg/kg = micrograms per kilogram.
 "J" = estimated value.
 mg/kg = milligrams per kilograms.

whether contaminants from the SWMU 3 were migrating off-site via the surface water conveyance system.

Detected SVOCs included di-n-butyl phthalate and pentachlorophenol reported in sample MPT-2-SD-7 at 160 $\mu\text{g}/\text{kg}$ and 430 $\mu\text{g}/\text{kg}$, respectively. A congener of DDT, 4,4'-DDE, was detected in sample MPT-2-SD-7, MPT-2-SD-7DL, and MPT-2-SD-7ADL at low levels of 3.4 $\mu\text{g}/\text{kg}$, 3.5 $\mu\text{g}/\text{kg}$, and 4.1 $\mu\text{g}/\text{kg}$ respectively. Another congener of DDT, 4,4'-DDD was detected in sample MPT-2-SD-7 at 1.3 $\mu\text{g}/\text{kg}$. Various metals were found in the sediment samples, but not at levels indicating a release of hazardous substances from SWMU 3. Additional sediment sampling is not recommended for SWMU 3.

Soil Sample. A subsurface soil sample was collected from MPT-2-MW16S during well construction. Table 4-28 presents the organic and inorganic chemicals detected in this subsurface soil sample. Xylenes (total) were detected at an estimated concentration of 2 $\mu\text{g}/\text{kg}$. A congener of DDT, 4,4'-DDE, was detected at 1.8 $\mu\text{g}/\text{kg}$. Another congener of DDT, 4,4'-DDD, was detected at 0.9 $\mu\text{g}/\text{kg}$. No other VOC, SVOC, or PCB was detected in the sample. Various metals were detected, but not at concentrations indicating a release of hazardous substances from SWMU 3.

Groundwater Samples. Groundwater in the unconfined surficial aquifer at Mayport is classified Class G-II as defined by Chapter 17-3.403, FAC. Class G-II groundwater is potable-use groundwater in aquifers that have TDS contents of less than 10,000 mg/ℓ , unless otherwise classified. G-II groundwater should meet primary and secondary drinking water quality standards as listed in Chapters 17-550.310 and 550.320, FAC. TDS, as measured by a gravimetric method (USEPA Method 160.1), ranged from 7,580 mg/ℓ in sample MPT-2-MW8-1 to 1,380 mg/ℓ in sample MPT-2-MW5-1. TDS as measured by the gravimetric method is biased low for many of the analyses if compared to an ion balance.

General water quality of the surficial aquifer at SWMU 3 is characterized by saline conditions as measured by TDS in six SWMU wells (Table 4-29). Based on this parameter alone, potable use of the aquifer is unlikely. Agricultural and industrial uses are also unlikely or limited at best. Although the surficial aquifer is classified G-II, secondary standards (Chapter 17.550.320, FAC) are exceeded in most of the surficial wells for TDS, chloride, and sulfate. Maximum contaminant levels as specified in Chapter 17.550.320, FAC, for TDS and chloride are 500 and 250 mg/ℓ , respectively. Approximate median values in the unconfined surficial aquifer in SWMU 3 for these parameters are 5,000 and 7,000 mg/ℓ , respectively. Reducing conditions were also evident from the presence of sulfide in the surficial aquifer. Anaerobic conditions and the presence of sulfide in the surficial aquifer would reduce the mobility of possible metal contaminants if present.

Groundwater samples were collected from four wells at SWMU 3. Table 4-30 summarizes the results for potential chemicals-of-concern detected above quantitation limits in the SWMU 3 groundwater samples. Figure 4-31 also presents sample locations and laboratory results. Low concentrations of the SVOC 2,4-dimethylphenol were detected in three of four groundwater samples from SWMU 3. 2,4-dimethylphenol was detected in groundwater samples at 13 $\mu\text{g}/\ell$ in sample MPT-2-MW-8-1.

**Table 4-28
Detected Organic and Inorganic Chemicals
in SWMU 3 Soil Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20753			
Sample Matrix:			Soil			
Location/Sample No.:			MPT-2-16S		MPT-2-17S	
Date Sampled:			01/24/92		01/24/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.
1330-20-7	Xylene (total)	µg/kg	2	J	2	J
72-55-9	4,4'-DDE	µg/kg	1.8			
50-29-3	4,4'-DDT	µg/kg	0.9	J	0.86	J
7440-38-2	Arsenic	mg/kg	0.22	J	5.3	J
7440-39-3	Barium	mg/kg	4.4	J	4.3	J
7440-47-3	Chromium	mg/kg	3.1	J	0.69	J
7440-50-8	Copper	mg/kg	2.8	J		
7440-92-1	Lead	mg/kg	10.6	J		
7440-02-0	Nickel	mg/kg	3.1	J		
7440-66-6	Zinc	mg/kg	50.9	J		
<p>Notes: Laboratory data validated with NEESA Level C criteria. Conc. = concentration. Qual. = qualifier. µg/kg = micrograms per kilogram. *J* = estimated value. mg/kg = milligrams per kilogram.</p>						

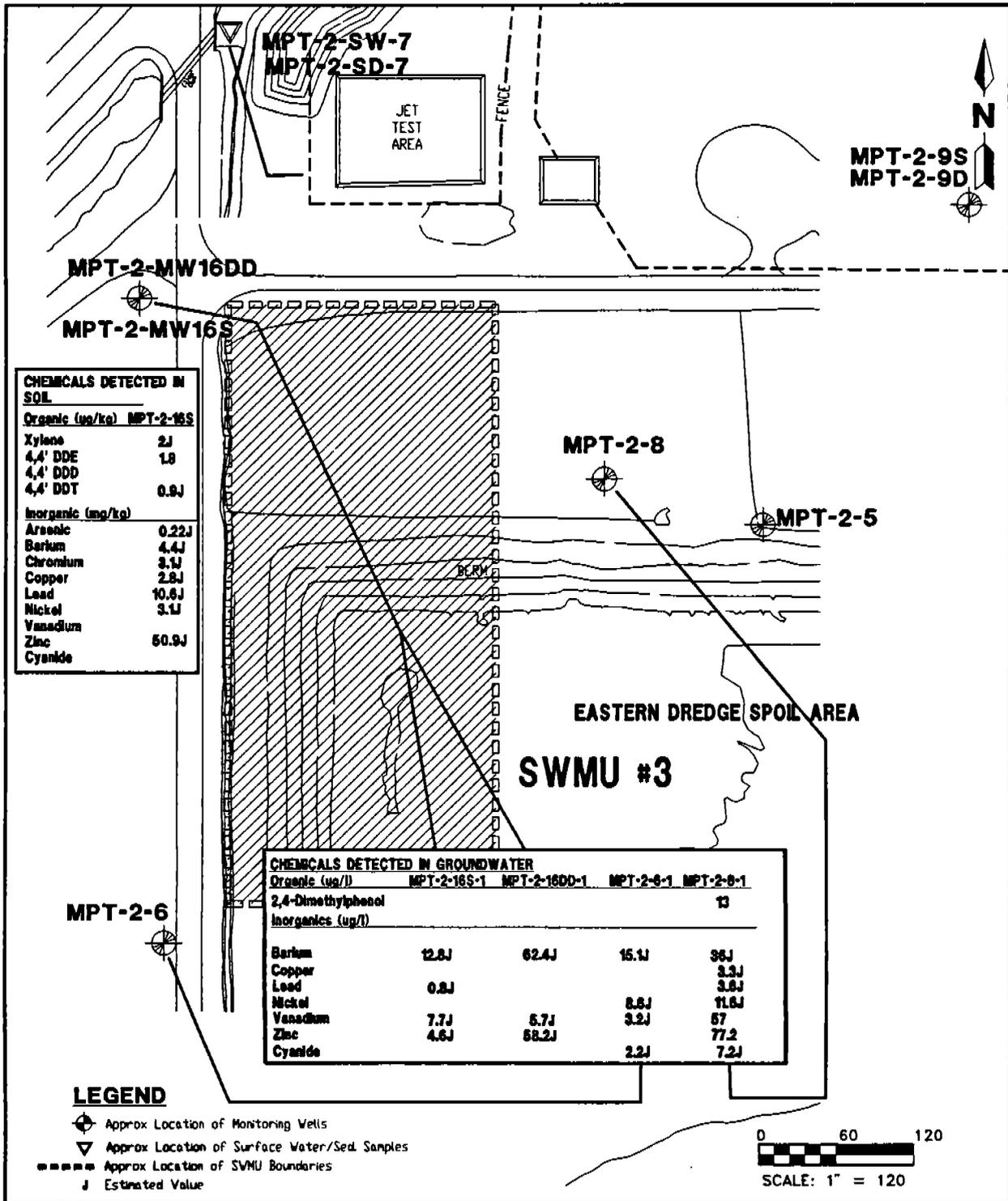


FIGURE 4-31
SWMU 3 - LANDFILL D
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN SOIL AND GROUNDWATER



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**Table 4-29
General Water Quality for SWMU 3 Groundwater Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

USEPA Method	Analyte	Unit	Concentrations in Samples:					
			MPT-2-MW5-1	MPT-2-MW6-1	MPT-2-MW8-1	MPT-2-MW16S-1	MPT-2-MW16DD-1	MPT-2-MW15D-1
160.1	Total Dissolved Solids	mg/l	1,380	16,400	7,580	1,640	NR	24,100
325.1	Chloride	mg/l	141	6,721,120	7,750	594	30,500	25,400
376.1	Sulfide	mg/l	0.3	<1.0	5	0.9	<0.1	5.3
375.4	Sulfate	mg/l	482	0.2	488	10.2	2,570	1,580

Note: mg/l = milligrams per liter.

**Table 4-30
Detected Organic and Inorganic Chemicals in SWMU 3 Groundwater Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:		20884	20877	20877	20931
Sample Matrix:		Water	Water	Water	Water
Location/Sample No.:		MPT-2-MW6-1	MPT-2-MW8-1	MPT-2-MW16S-1	MPT-2-MW16DD-1
Date Sampled:		02/11/92	02/10/92	02/10/92	02/14/91
CAS RN	Common Name	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.
	Units				
105-67-9	2,4-Dimethylphenol	15.1	13	12.8	62.4
7440-39-3	Barium	J	36	J	J
7440-50-8	Copper	J	3.3	J	J
7440-92-1	Lead	J	3.6	J	J
7440-02-0	Nickel	J	11.6	J	J
7440-62-2	Vanadium	J	57	7.7	5.7
7440-66-6	Zinc	J	77.2	4.6	58.2
5955-70-0	Cyanide	J	7.2	J	J

Notes: Laboratory data validated with NEESA Level C criteria.

Conc. = concentration.

Qual. = qualifier.

µg/l = micrograms per liter.

"J" = estimated value.

No pesticides or PCBs were detected in any groundwater samples. Inorganic elements and compounds (barium, copper, lead, nickel, vanadium, zinc, and cyanide) were detected at low concentrations in groundwater samples.

Samples for metals were collected without filtration and were preserved immediately after collection with acid. The metal results are, therefore, total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions.

The following metals were detected in groundwater samples collected from SWMU 3.

- Estimated barium concentrations ranged from 15.1 $\mu\text{g}/\text{l}$ in sample MPT-2-MW6-1 to 62.4 $\mu\text{g}/\text{l}$ in sample MPT-2-MW16DD-1.
- Copper concentrations was estimated at 3.3 $\mu\text{g}/\text{l}$ in sample MPT-2-MW8-1.
- Lead concentrations was estimated at 3.6 $\mu\text{g}/\text{l}$ in sample MPT-2-MW8-1 and 0.8 $\mu\text{g}/\text{l}$ in sample MPT-2-MW16S-1.
- Estimated nickel concentrations ranged from 8.6 $\mu\text{g}/\text{l}$ in sample MPT-2-MW6-1 to 11.6 $\mu\text{g}/\text{l}$ in sample MPT-2-MW8-1.
- Estimated vanadium concentrations ranged from 3.2 $\mu\text{g}/\text{l}$ in sample MPT-2-MW6-1 to 57 $\mu\text{g}/\text{l}$ in sample MPT-2-MW8-1.
- Estimated zinc concentrations ranged from 4.6 $\mu\text{g}/\text{l}$ in sample MP-2-MW16S-1 to 77.2 $\mu\text{g}/\text{l}$ in sample MPT-2-MW8-1.
- Estimated cyanide concentrations ranged from 2.2 $\mu\text{g}/\text{l}$ in sample MPT-2-MW6-1 to 7.2 $\mu\text{g}/\text{l}$ in sample MPT-2-MW8-1.

The data do not indicate apparent groundwater contamination at SWMU 3. The frequency and magnitude of SVOC and metal detections do not indicate a systematic pattern of release of Appendix IX inorganic constituents groundwater at SWMU 3.

4.7 SWMU 4, LANDFILL E.

4.7.1 SWMU 4 Description Historic information on the permitted SWMUs at NAVSTA Mayport has been consolidated in the IAS in 1986. The IAS was conducted under the Navy's earlier program called the NACIP that addressed the CERCLA of 1980. The following information on the disposal activities at SWMU 4, Landfill E, was obtained from this study (ESE, 1986).

SWMU 4 is located west of SWMUs 2, 3, and 5, and northeast of the western dredge spoils area (Figure 4-32). It consists of two areas separated by a drainage ditch. The landfill was managed as a trench and fill operation from 1963 to 1966. Construction debris was placed on the old fill area between 1974 to 1980. The landfill consisted of approximately 12 trenches excavated by dragline to about 15-foot wide by 300-foot long by 8-foot deep. The trenches were excavated in incremental stages. The landfill covered approximately 11 acres.

The trenches intersected the water table and wastes were deposited into the standing water. Combustible materials above water were burnt daily. Wastes

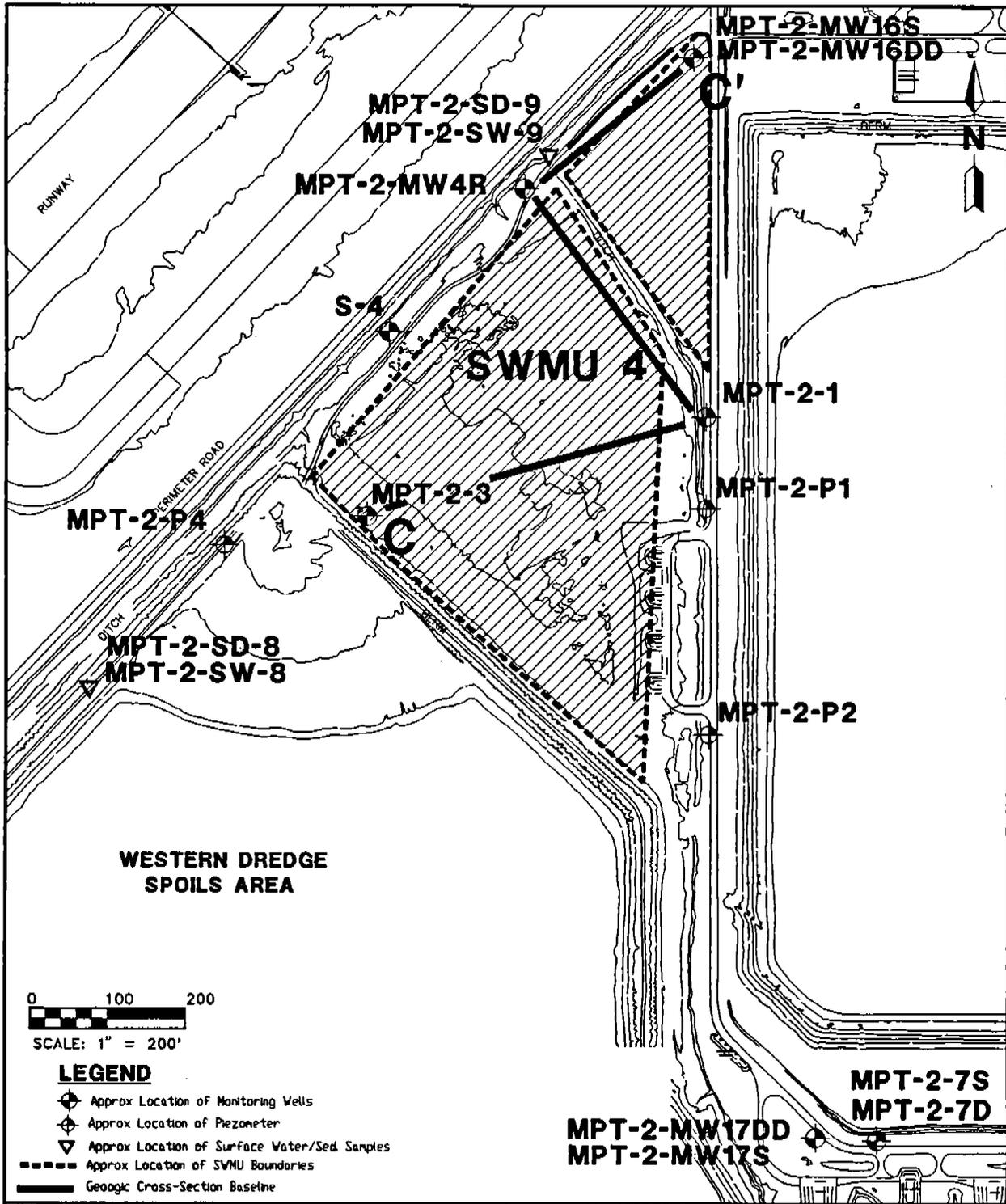


FIGURE 4-32
SWMU 4 - LANDFILL E
SITE PLAN



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included: sanitary wastes, oils, asbestos, paints, toluene, mercury lamps, hydraulic fluids, solvents, sulfuric acid, transformer oil, plating solutions, batteries, pesticide cans, photographic wastes, and other materials. The IAS estimated that a total of 54,000 gallons per year of liquid wastes was disposed at SWMU 4 during its operations, and that at least 97,000 gallons were left at closure. The landfill was graded and covered with topsoil when closed. A small part of the northern part of the site near the ordnance access road has been graded with a thin bed of road base and is being used as a temporary storage area for transportation and construction vehicles.

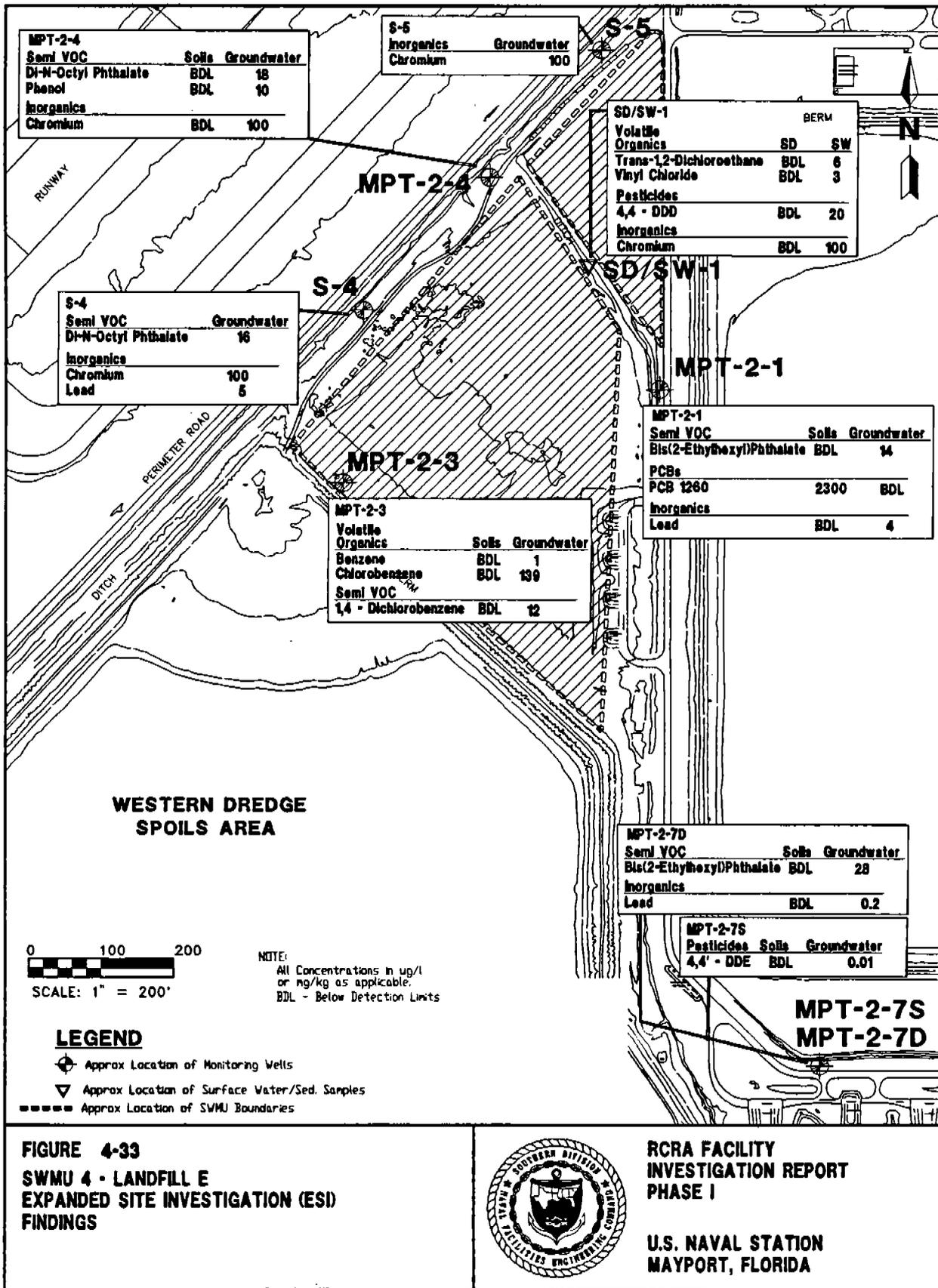
4.7.2 Summary of Previous Findings Soil, groundwater, and surface water samples were collected at SWMU 4 and analyzed for Priority Pollutant List compounds during the ESI in 1987. Figure 4-33 presents the sample locations and detected chemicals. No VOCs were detected in soils, but benzene (1 $\mu\text{g}/\ell$) and chlorobenzene (139 $\mu\text{g}/\ell$) were detected in a groundwater sample from monitoring well MPT-2-3. VOCs were also detected in a surface water sample collected from the ditch that crosses SWMU 4. This sample contained trans-1,2-dichloroethene (6 $\mu\text{g}/\ell$) and vinyl chloride (3 $\mu\text{g}/\ell$). The surface water sample also contained 4,4'-DDD at 20 $\mu\text{g}/\ell$. Both chromium and lead were detected in groundwater. Total lead was detected in a sample from monitoring well S-4 at a concentration of 5 $\mu\text{g}/\ell$. The concentration of total chromium found in groundwater samples from monitoring wells MPT-2-4, S-4, and S-5 was 100 $\mu\text{g}/\ell$. Chromium was also detected in the surface water sample at 100 $\mu\text{g}/\ell$.

4.7.3 Summary of Exploration and Sampling Program The exploration program at SWMU 4 included the following data-gathering activities:

- installation of one deep monitoring well completed at the top of the Hawthorn Group, one shallow surficial monitoring well, one replacement well (originally installed during the ESI but subsequently damaged), and nine piezometers in the surficial aquifer;
- sampling of subsurface soil during borehole construction for new shallow monitoring wells;
- sampling and analyzing groundwater at new and existing monitoring wells; and
- sampling and analyzing sediment and surface water samples collected from inverts of the storm drain conveyance system.

The locations of these exploration and sampling activities at SWMU 4 are presented in Figure 4-32. The data gathering activities were composed of the field activities described below. Field activities followed the standard operating procedures in project-specific Technical Memoranda located in Appendix B, Site-Specific QAP of the RFI Workplan, Volume II (U.S. Navy, 1991b). Table 4-31 summarizes the type, frequency, and media of samples collected at SWMU 4 during the Phase 1 RFI.

Drilling and Subsurface Soil Sampling. Drilling and subsurface soil sampling were accomplished as described in the Technical Memorandum, Drilling and Subsurface Soil Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991). Borehole locations are shown in Figure 4-32. Soil samples were analyzed by the



**Table 4-31
Summary of SWMU 4 Chemical Analyses**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Source	Media	U.S. Environmental Protection Agency SW-846 ¹						Totals
		Method 8240 VOC	Method 8270 SVOC	Method 6010, 7470, 7480 Metals	Method 8080 Pest/PCB	General Parameters (soil)	General Water Quality	
SWMU 4	Soil ²	1	1	1	1	1	0	5
	Sediment ²	2	2	2	2	0	0	8
	Groundwater ²	6	6	6	6	0	6	30
	Surface water ²	2	2	2	2	0	2	10

¹ Selected Appendix IX Groundwater Monitoring List Compounds as analyzed by method indicated.
² Includes field duplicate samples.

Notes: VOC = volatile organic compounds.
SVOC = semivolatile organic compounds.
Pest/PCB = organochlorine pesticides and polychlorinated biphenyls.
SWMU = solid waste management unit.

USEPA SW-846 methods specified in the Workplan. Selected physical parameters were also measured and included: bulk density (ASTM D2937-83), cation exchange capacity (USEPA Method 9081), organic content (USEPA Method 9060), soil pH (USEPA Method 9045), particle size distribution (ASTM D422-63), and moisture content (ASTM D2216-80).

Well Construction and Development. Well and piezometer locations are presented in Figure 4-32. Table 4-32 lists the SWMU 4 monitoring well and piezometer inventory and construction specifications. Well construction and development was accomplished as described in the Technical Memorandum, Well Construction and Development, Appendix B, of the RFI Workplan, Volume II (U.S. Navy, 1991b). Well and piezometer boring logs and construction details are presented in Appendix A, Volume II of this report.

Groundwater Sampling. Groundwater sampling was accomplished as described in the Technical Memorandum, Groundwater Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b). A total of six groundwater samples were collected, one from each of the existing and new monitoring wells. Samples were analyzed by USEPA SW-846 methods specified in the Workplan. Selected general water quality parameters were also measured in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983).

Sediment and Surface Water Sampling. Sediment and surface water sampling locations are shown in Figure 4-32. Two sediment and surface water samples were collected from the drainage system at SWMU 4. Sediment and surface water sampling was accomplished as described in the Technical Memorandum, Sediment and Surface Water Sampling, Appendix B in the RFI Workplan, Volume II (U.S. Navy, 1991b) and as summarized in Chapter 3.0 of this report.

4.7.4 Environmental Setting Sediment, surface water, subsurface soil, and groundwater are the media of concern at SWMU 4 based on the past disposal practices, site closure methods, and SWMU-specific analytical measurements. This section summarizes the geological and hydrogeological factors affecting contaminant fate and migration in these media at SWMU 4.

4.7.4.1 Geology This section describes the geological setting observed at SWMU 4 during the Phase 1 RFI. The Upper Hawthorn Group structure at the site is deduced from the deep boring made at SWMU 3 as well as the deep boring made just south of SWMU 4. Physical characteristics of soils measured at SWMU 4 that affect contaminant migration are also presented in this section.

Geological Setting. Figure 4-34 shows a cross section summarizing the SWMU 4 geology. The cross section was composed from boring log data from new and existing monitoring wells and piezometers installed at SWMU 4. The cross section illustrates features typical of the Group I SWMUs. The uppermost unit consists of a surficial deposit of material dredged from the Mayport turning basin and the St. Johns River. Typically, beneath the surficial dredge material, a uniform, poorly graded, well sorted, sand (SP) with lenses of a very soft grey to dark-grey silty clay (CH, CM) are found. This sand unit, termed in the cross section undifferentiated post-Hawthorn deposits, grades at depth into the third unit, the Coosawhatchie Formation of the Upper Hawthorn Group (Scott, 1988).

**Table 4-32
Summary of SWMU 4 Piezometer and Monitoring Well Installations**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU Number	Piezometer and Monitoring Well No.	Phase	Diameter (inches)	Total Depth (feet)	Screened Interval (feet bls)
4	MPT-2-1	ESI	2	10	3 - 10
	MPT-2-3	ESI	2	15	5 - 15
	MPT-2-7S	ESI	2	12	3.5 - 10.5
	MPT-2-7D	ESI	2	25	15 - 25
	MPT-2-P1	Phase 1 RFI	2	8	3 - 8
	MPT-2-P2	Phase 1 RFI	2	9	4 - 9
	MPT-2-P3	Phase 1 RFI	2	32	27 - 32
	MPT-2-P4	Phase 1 RFI	2	35	30 - 35
	MPT-2-P7	Phase 1 RFI	2	10	5 - 10
	MPT-2-P9	Phase 1 RFI	2	35	30 - 35
	MPT-2-P10	Phase 1 RFI	2	35	30 - 35
	MPT-2-P11	Phase 1 RFI	2	35	30 - 35
	MPT-2-P12	Phase 1 RFI	2	30	25 - 30
	MPT-2-MW17DD	Phase 1 RFI	4	125	115 - 125
	MPT-2-MW17S	Phase 1 RFI	2	13	3 - 13
	MPT-2-MW4R	Phase 1 RFI	2	13	3 - 13

Notes: SWMU = solid waste management unit.
bls = below land surface.
ESI = Expanded Site Investigation; E.C. Jordan; conducted September 1987 to October 1987.
Phase 1 RFI = Phase 1 RCRA Facility Investigation; ABB Environmental Services; conducted January 1992 to March 1992.

Physical Characteristics of Soil. The grain-size distribution analysis of the subsurface soil sample (MPT-2-17S) collected near SWMU 4 shows a moderately well-graded fine- to medium-grained sand (Table 4-33). Another subsurface soil sample downgradient of SWMU 3 but in close proximity to SWMU 4 (MPT-2-16S) showed poorly-graded, predominately fine-grained sands. An estimated effective porosity range of 0.25 to 0.35 appears reasonable (0.35 is used for the estimation of average groundwater velocities) for the sands of the surficial aquifer at SWMU 4. The organic content (less than 1 percent) and ion exchange capacity (less than 2 milliequivalents per 100 grams) of the soils are relatively low as summarized in Table 4-34. This implies that retardation of contaminants in groundwater flow will be small and, therefore, soluble contaminants will travel at approximately the same velocity as the groundwater.

**Table 4-33
SWMU 4 Soil Uniformity Coefficient**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample	Percent Sand			Uniformity Coefficient Cu ¹
	F	M	C	
MPT-2-17S	65	35		3.9

¹ Cu = D₆₀/D₁₀
Cu < 4 = well sorted, poorly graded.
Cu < 6 = poorly sorted, well graded.

Notes: F = fine.
M = medium.
C = coarse.

4.7.4.2 Hydrogeology The hydrogeologic investigations conducted at SWMU 4 during the Phase I RFI collected data to characterize the potentiometric surface of the water table aquifer, estimate the hydraulic conductivities, and compute the average velocity of the groundwater flow in the uppermost aquifer at the site. These parameters were estimated based on synoptic water table elevations, *in-situ* permeability testing (i.e., slug-tests), and soil characteristics of the aquifer formation. Darcy's Law was used to estimate average groundwater flow velocities.

Slug Test. Both rising- and falling-head slug tests were conducted at selected SWMU 4 piezometers (MPT-2-P2, MPT-2-P4, MPT-2-P9, and MPT-2-P11) depending on the screened intervals of the piezometer and their location relative to the water table. Up to six trials were conducted at each location in order to provide an average of the estimated hydraulic conductivities (K) of the aquifer in the vicinity of the screened intervals. From the multiple trials, the precision of the K data was also evaluated. These data are presented in Table 4-35 for SWMU 4.

Table 4-34
SWMU 4 Physical Soil Characteristics

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Matrix:	Soil
Location/Sample No.:	MPT-2-16S
Analyte	
Percent moisture	7.9
Soil bulk density	1.45
Cation exchange capacity	1.9
pH	8.42
TOC	3,780
<p>Notes: Soil bulk density = grams per cubic centimeter. Cation exchange capacity = milliequivalents per 100 grams. pH = standard units. TOC = total organic carbon in milligrams per liter.</p>	

Table 4-35
***In-Situ* Hydraulic Conductivities (K) at SWMU 4**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU	Well/Piezometer	Runs	Range of K (feet/day)	Median K (feet/day)	Average K (feet/day)	Screen Interval (feet bls)
4	MPT2-P2	4	7.425 - 8.361	7.963	7.929	5 - 10
4	MPT2-P4	5	11.698 - 16.992	12.348	13.137	30 - 35
4	MPT2-P9	5	15.826 - 19.152	18.216	18.009	30 - 35
4	MPT2-P11	6	6.393 - 9.092	7.429	7.647	30 - 35
<p>Note: Runs are slug-test data retrieval events. bls = below land surface.</p>						

Piezometers MPT-2-P4, MPT-2-P9, and MPT-2-P11 were installed around the berm of the western dredge spoils area to assess the mounding effects on groundwater flow at SWMU 4 and surrounding areas. The range of *in-situ* measured conductivities for these piezometers ranged from 7.4 to 19.2 feet per day. MPT-2-P2 is installed near the southern end of SWMU 4 below the berm and is screened within the surficial aquifer between 5 to 10 feet bls in fine- to medium-grained sands with shell fragments. MPT-2-P2 had a median *in-situ* conductivity of approximately 8 feet per day. The conductivity measured at MPT-2-P2 was used to estimate apparent groundwater velocities at SWMU 4 due to its proximity to the SWMU relative to other piezometers. Its measured conductivity is also consistent with *in-situ* measurements made at MPT-2-3 during the ESI (5.7 feet per day) and at MPT-2-P5 (5.5 feet per day) in close proximity to SWMU 4.

Groundwater Gradient and Flow Velocity. Water table elevations were measured on February 16, March 25, and April 20, 1992, for selected piezometer and monitoring wells throughout NAVSTA Mayport. Groundwater measurements were obtained specifically from seven piezometers and eight monitoring wells at SWMU 4. The measurements were achieved within a 4-hour period during each measurement event. Table 4-36 presents the water table measurements at SWMU 4 for these three measurement events.

Facility-wide water table surface maps were developed for each monthly measurement event to provide a synoptic view of the water table surface throughout NAVSTA Mayport. Because no significant monthly variation was observed on a facility-wide basis (the coefficient of variation of groundwater elevations was less than 1), an average water table surface map was developed using the measurements from all three groundwater elevation survey events. The estimated water table surface map for SWMU 4 using both SWMU-specific and facility-wide synoptic data is presented in Figure 4-35.

Selected NAVSTA Mayport groundwater wells and piezometers were monitored over a 48-hour period in February 1992 to observe possible influences from tidal effects. Wells located away from tidally influenced water bodies (greater than 100 feet) were minimally affected by tidal fluctuations. Groundwater response in these wells was weak to non-existent. Monitoring wells at SWMU 4 are not expected to be significantly influenced by tidal effects.

Groundwater flow at SWMU 4 is affected by the mounding of groundwater by the elevated dredge spoils area. Gradients are approximately 0.01 foot per foot at the base of the dredge spoils area berm. Gradients decrease as groundwater enters the low relief of SWMU 4 and flows radially out towards the north and east, possibly intercepting surface drainage features. Gradients within SWMU 4 are estimated to range from 0.001 to 0.003 foot per foot. Average groundwater velocities were calculated based on Darcy's Law using estimates of porosity, permeability, and aquifer gradients (based on synoptic water table elevations) obtained from the field and laboratory observations. Table 4-37 summarizes the estimated parameter values and velocities.

4.7.5 Release Characteristics This section describes the extent of contamination observed at SWMU 4, Landfill F, during the Phase 1 RFI. Investigations described in this section of the report include: sediment investigation, surface water investigation, subsurface soil investigation, and groundwater investigation.

Table 4-36
Summary of SWMU 4 Water Level Data

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Well/Piezometer	X Eastings State Plane ¹	Y Northings State Plane ¹	Z Elev. (MSL)	Water Level 02/16/92			Water Level 03/25/92			Water Level 04/20/92			Avg. Elev. ² (MSL)	Depth Standard Deviation ³	
				Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)			
				MPT-2-MW-17D	365773.232	2197411.958	7.79	01:32 am	4.10	3.69	4.13	03:36 pm			3.66
MPT-2-MW-17S	365775.389	2197409.629	7.73	01:35 am	3.46	4.27	4.22	03:36 pm	3.51	4.22	04:58 pm	3.65	4.08	4.19	0.08
MPT-2-P2	365498.303	2198464.046	7.97	01:37 am	2.82	5.15	5.16	03:51 pm	2.81	5.16	04:50 pm	2.88	5.09	5.13	0.03
MPT-2-P4	364241.389	2198966.849	32.74	12:55 pm	27.68	5.06	5.94	03:30 pm	26.8	5.94	05:44 pm	26.67	6.07	5.69	0.45
S-4	364658.446	2199526.503	9.61	NM	NM	NM	2.94	03:35 pm	6.67	2.94	07:53/472	6.44	3.17	3.06	0.02
MPT-2-3	364604.886	2199038.697	17.20	NM	NM	NM	8.05	03:25 pm	9.15	8.05	05:48 pm	9.01	8.19	8.12	0.07
MPT-2-MW-4R	365011.200	2199898.717	8.29	12:55 pm	5.06	3.23	3.04	03:40 pm	5.25	3.04	06:00 pm	5.14	3.15	3.14	0.08
MPT-2-P12	365157.004	2198870.257	32.75	01:03 pm	23.65	9.10	8.63	02:50 pm	24.12	8.63	05:12 pm	24.26	8.49	8.74	0.26
MPT-2-P11	364395.626	2196198.862	31.85	01:07 pm	24.46	7.39	5.96	03:00 pm	25.89	5.96	05:19 pm	26.01	5.84	6.40	0.70
MPT-2-P10	363415.515	2195899.820	32.02	01:11 pm	19.75	12.27	8.99	03:05 pm	23.03	8.99	05:26 pm	23.51	8.51	9.92	1.67
MPT-2-P9	362977.876	2197566.006	32.18	01:15 pm	26.20	5.98	5.75	03:10 pm	26.43	5.75	01:15 pm	24.65	7.53	6.42	0.79
MPT-2-7S	365926.741	2197405.627	10.49	01:27 pm	6.24	4.25	4.18	03:43 pm	6.31	4.18	05:03 pm	6.44	4.05	4.16	0.08
MPT-2-7D	365934.423	2197403.643	9.70	01:30 pm	6.58	3.12	2.96	03:43 pm	6.74	2.96	05:05 pm	6.56	3.14	3.07	0.08
MPT-2-1	365498.666	2199297.512	10.33	01:40 pm	6.10	4.23	4.26	03:11 pm	6.07	4.26	04:40 pm	6.07	4.26	4.24	0.1
MPT-13-P3	367715.816	2201497.109	10.18	02:16 pm	3.90	6.28	6.03	01:44 pm	4.15	6.03	12:00 am	NM	NM	6.16	0.13

¹Florida State Plane Coordinate System.

²Arithmetic average of all water level measurements for each well.

³Standard deviation of all water level measurements for each well.

Notes: Elev. = elevation.

MSL = mean sea level.

LCL = local.

TOC = top of casing as datum.

NM = not measured.

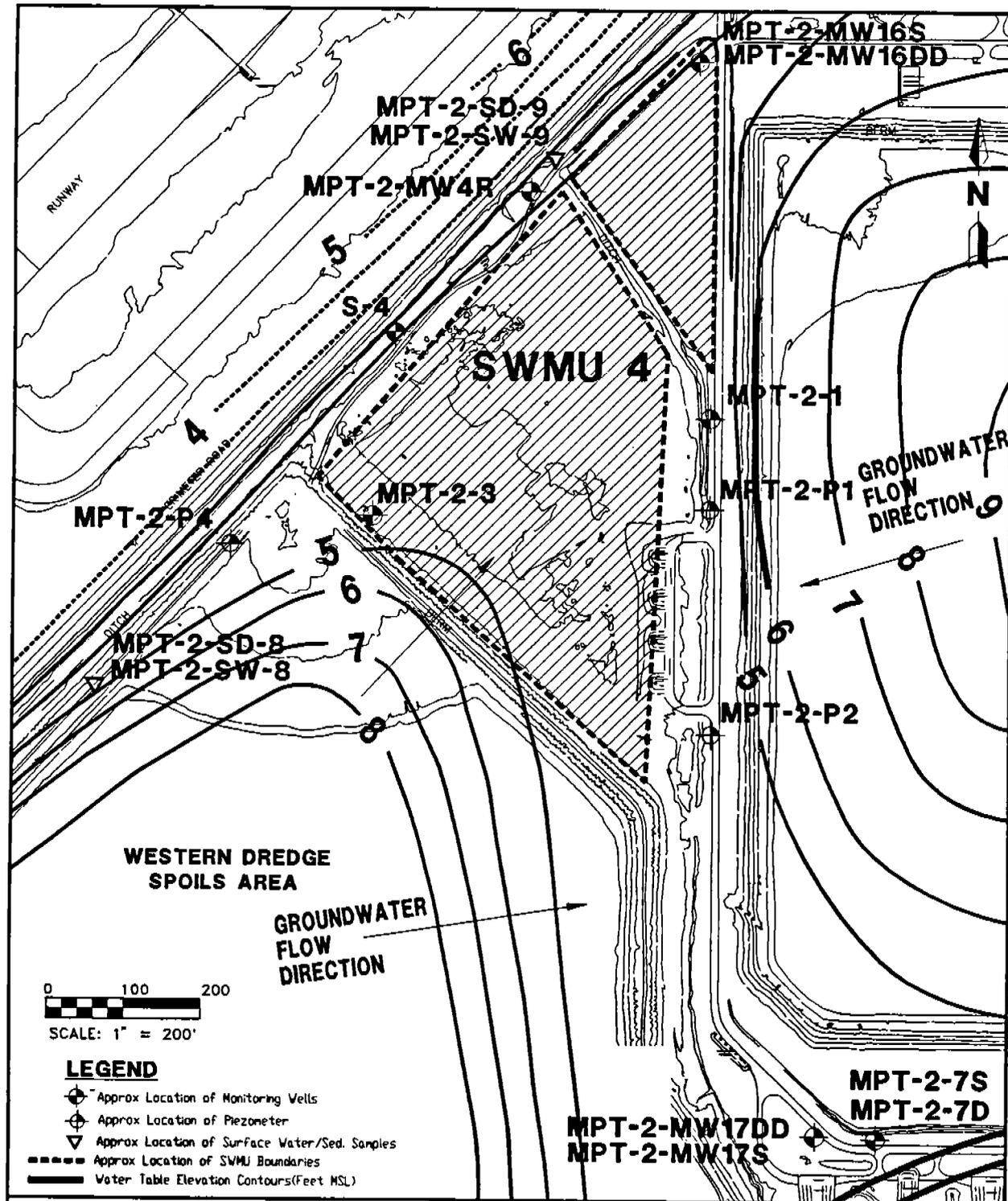
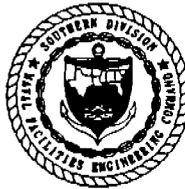


FIGURE 4-35
SWMU 4 - LANDFILL E
WATER TABLE SURFACE MAP



RCRA FACILITY
INVESTIGATION REPORT
PHASE I

U.S. NAVAL STATION
MAYPORT, FLORIDA

**Table 4-37
 Estimation of Average Groundwater Velocities at SWMU 4
 Based on Darcy's Law**

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Location	Estimated Effective Porosity (Percent)	Hydraulic Conductivity (feet/day)	Estimated Gradient (feet/feet)	Calculated Average Velocity (feet/day)	Estimated Average Velocity (feet/day)
MPT-2-P2	0.35	8	0.003	0.069	0.07
MPT-2-4R	0.35	8 ¹	0.001	0.023	0.02
MPT-2-3	0.35	5.7 ²	0.01	0.163	0.16

¹ Estimated based on in-situ conductivity measurement at MPT-2-P2 during the Phase 1 RFI, February 1992.

² Measured during the Expanded Site Investigations, October 1987.

The samples of environmental media (sediments, surface water, soil, and groundwater) were analyzed for organic and inorganic constituents by USEPA SW-846 Methods 8240 (VOCs), 8270 (SVOCs), 8080 (organochlorine pesticides and PCBs), 6010 (metals by ICP), 7420 (metals by GFAA), 7470 (metals by CVAA), and 9010 (cyanide).

The laboratory data for the selected Appendix IX analyses were validated in accordance with NEESA Level C requirements (NEESA, 1988) to determine data of known quality for site characterization and risk assessment. The data were either accepted without qualification, accepted as estimated values, or rejected. Chapter 3.0 discusses the data validation findings and data validation narratives are presented in Volume III, Appendix E.

Groundwater samples were also analyzed in the laboratory for the following general water quality parameters: TDS, chloride, alkalinity (as CaCO_3), hardness (as CaCO_3), sulfate, sulfide, TKN, ammonia (total), nitrite/nitrate, total phosphorous, TOC, oil and grease, color, and pH. Analyses were conducted in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983). These are non-CLP methodologies, and general water quality samples were collected and analyzed in accordance with NEESA Level E guidelines (NEESA, 1988).

Surface Water Sample Results. Surface water samples were collected the week of January 20, 1992, in accordance with the RFI Workplan (U.S. Navy, 1991a,b) at two locations (MPT-2-SW-8 and MPT-2-SW-9). These sample locations were chosen to determine whether possible contaminants from SWMU 4 were migrating off-site via the surface water conveyance system. Figure 4-36 presents the surface water sample locations and analytical results. Table 4-38 summarizes the detected chemicals in the SWMU 4 surface water samples.

Surface water around Mayport south of the St. Johns River is classified as Class III Waters for Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife (Chapter 17-302.560, FAC). Bar-chart summaries of measured surface water quality parameters for each sample are presented in Figure 4-37 and Figure 4-38.

TDS, as measured by a gravimetric method (USEPA Method 160.1), was 8,790 mg/l in sample MPT-2-SW-8 and 11,400 mg/l in sample MPT-2-SW-9. The TDS is biased low in these samples if compared to an ion balance. The surface water at SWMU 4 is moderately saline and general water quality is influenced by the estuarine character of Sherman Creek, Pablo Creek, and Chicopit Bay.

Sulfate and chloride were the dominant anions. Sulfate (SO_4^{2-}), a common form of sulfur found in oxygenated conditions, was 587 mg/l in sample MPT-2-SW-8 and 764 mg/l in sample MPT-2-SW-9. Sulfide (S^{2-}) is a form of reduced sulfur often found under anaerobic conditions. No sulfide was found in either above the method detection limit (<0.1 mg/l). Chloride ranged from 9,270 mg/l in sample MPT-2-SW-8 to 12,100 mg/l in sample MPT-2-SW-9. The surface waters at SWMU 4 meet the conditions for predominantly marine water as defined in Chapter 17-302.200, FAC (chloride $\geq 1,500$ mg/l).

**Table 4-38
Detected Inorganic Chemicals in SWMU 4 Surface Water Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20740		20740	
Sample Matrix:			Water		Water	
Location/Sample No.:			MPT-2-SW-8		MPT-2-SW-9	
Date Sampled:			01/23/92		01/23/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.
7440-38-2	Arsenic	$\mu\text{g}/\text{l}$	1.3	J	4.3	J
7440-39-3	Barium	$\mu\text{g}/\text{l}$	11.6	J	11.7	J
7440-50-8	Copper	$\mu\text{g}/\text{l}$			24.1	J
7440-92-1	Lead	$\mu\text{g}/\text{l}$			3.2	J
7440-49-2	Selenium	$\mu\text{g}/\text{l}$			2.3	J
7440-62-2	Vanadium	$\mu\text{g}/\text{l}$	6.1	J		
7440-66-6	Zinc	$\mu\text{g}/\text{l}$	6.3	J		
5955-70-0	Cyanide	$\mu\text{g}/\text{l}$			5.4	J
<p>Notes: Laboratory data validated with NEESA Level C criteria. Conc. = concentration. Qual. = qualifier. $\mu\text{g}/\text{l}$ = micrograms per liter. "J" = estimated value.</p>						

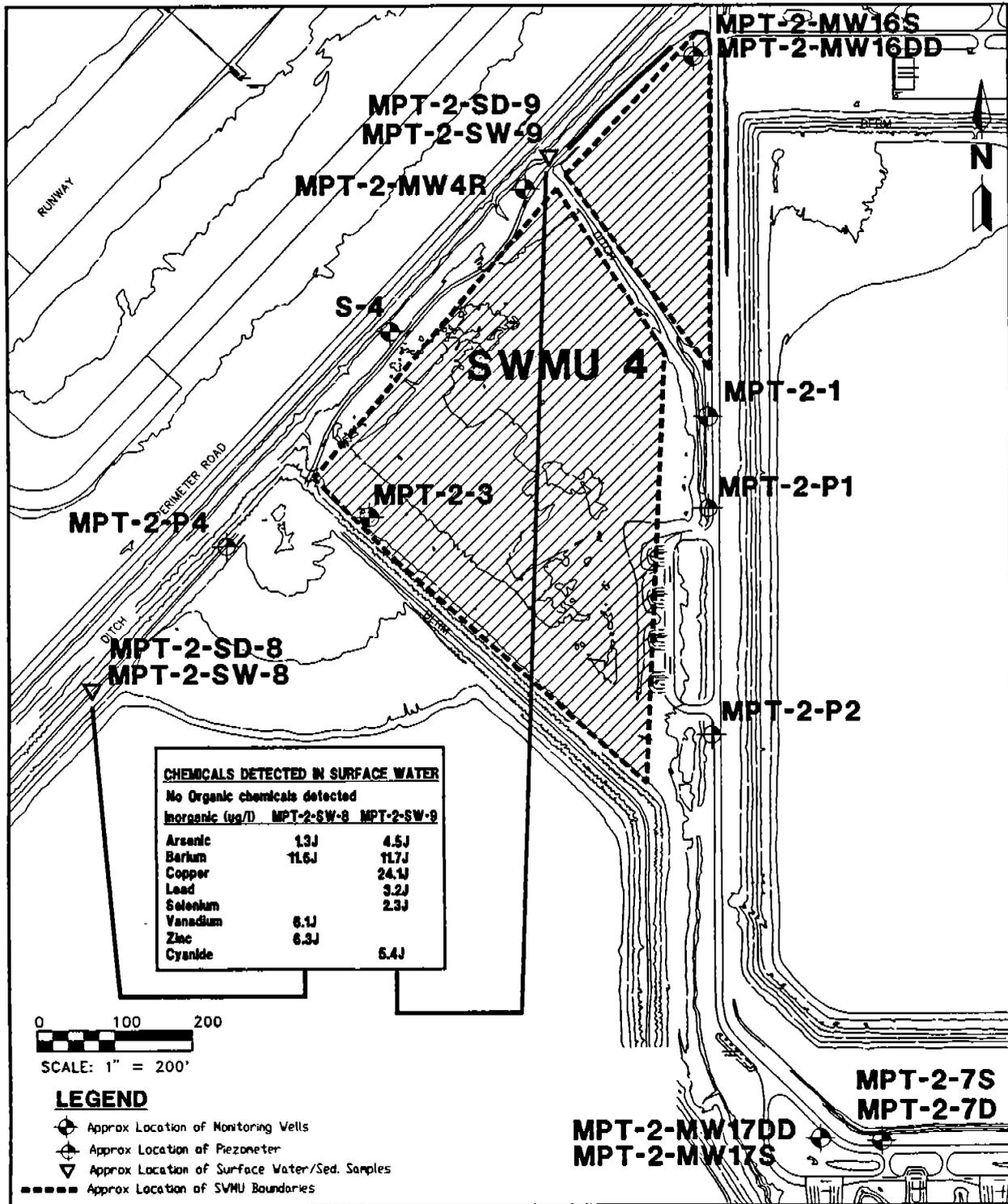


FIGURE 4-36
SWMU 4 - LANDFILL E
DETECTED CHEMICALS IN
SWMU 4 SURFACE WATER SAMPLES



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MAYPORT, FLORIDA

MAYPORT RCRA FACILITY INVESTIGATION

Surface Water Sample Location MPT-2-SW-8

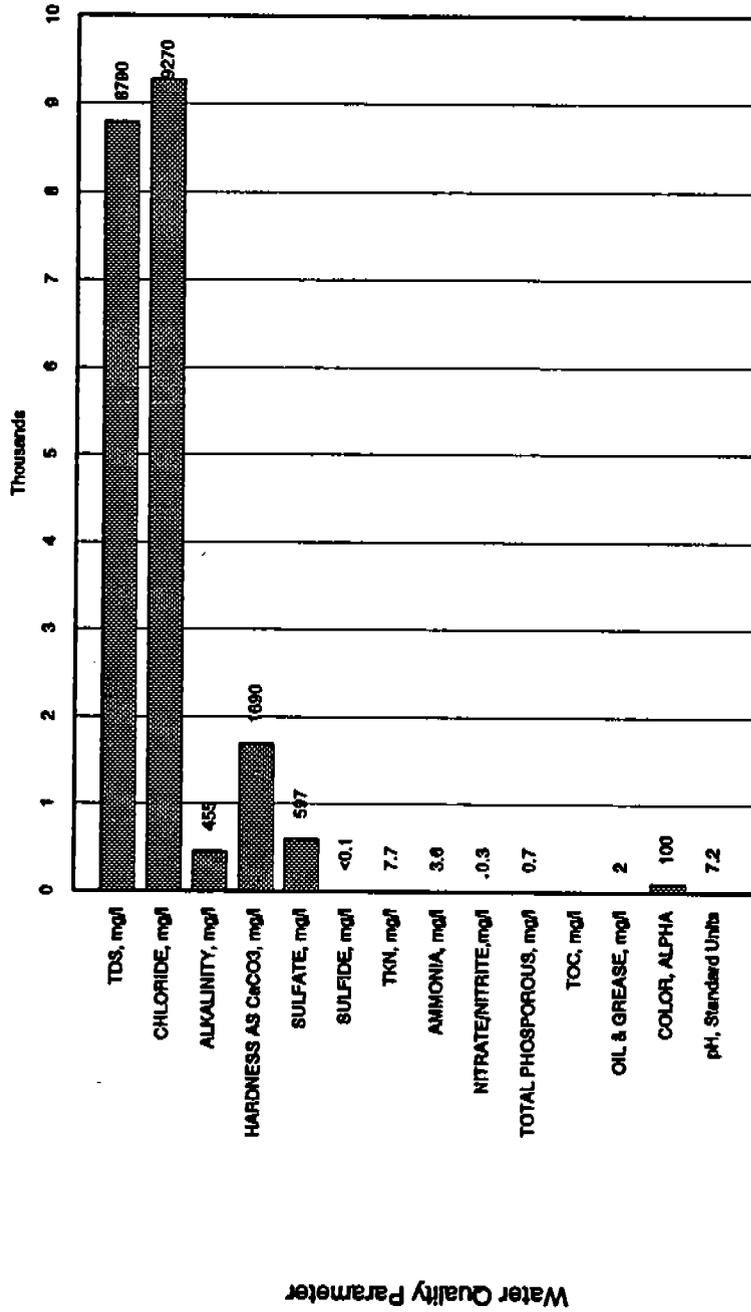


FIGURE 4-37
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-8



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MAYPORT, FLORIDA

MAYPORT RCRA FACILITY INVESTIGATION

Surface Water Sample Location MPT-2-SW-9

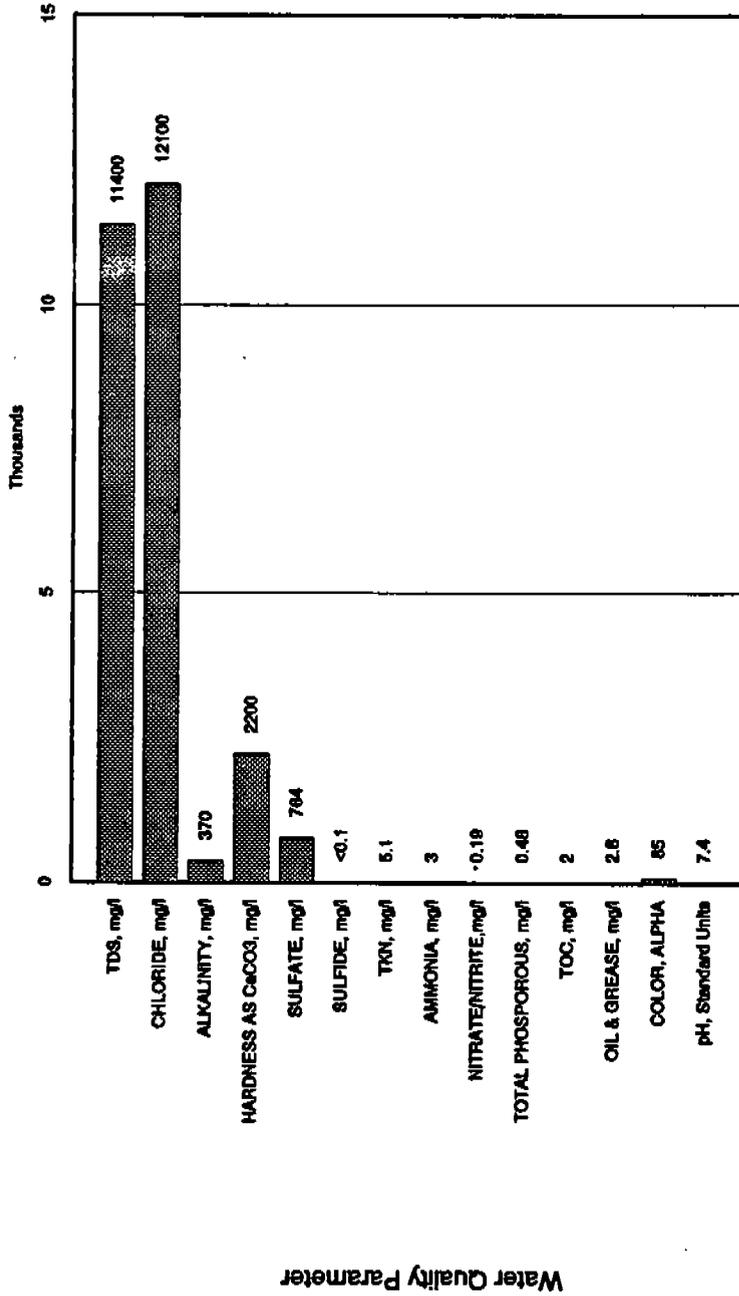


FIGURE 4-38
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-9



RCRA FACILITY
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PHASE I

U.S. NAVAL STATION
MAYPORT, FLORIDA

Alkalinity (as CaCO₃) was 370 mg/l in sample MPT-2-SW-9 and 455 mg/l in sample MPT-2-SW-8. Hardness (as CaCO₃) was 1,690 mg/l in sample MPT-2-SW-8 and 2,200 mg/l in sample MPT-2-SW-9, which is in the "hard" range for natural waters.

Surface water nutrient compounds measured during Phase 1 field activities included nitrogen and phosphorous. Nitrogen species included ammonia (total), TKN, and total nitrites and nitrates. Ammonia was analyzed using USEPA Method 350.2, which reports both un-ionized ammonia and ammonium ion. TKN was measured using USEPA Method 351.3. Nitrite and nitrate nitrogen were measured by USEPA Method 353.2.

Because all nitrogen forms were not detected at all locations, total nitrogen was estimated as the sum of TKN and nitrite and nitrate and used as a basis for comparison between sample locations. Total nitrogen concentrations were 5.29 mg/l (MPT-2-SW-9) and 8.0 mg/l (MPT-2-SW-8). Ammonia was also detected at 3.6 mg/l in sample MPT-2-SW-8 and 3.0 mg/l in sample MPT-2-SW-9. These were the only two surface water samples in the Group I area where ammonia nitrogen was observed.

Phosphorus was measured by USEPA Method 365.1, which determines total phosphorus including elemental phosphorus, orthophosphorus, and hydrolyzable (organic) phosphorus. Total phosphorus was 0.7 mg/l in sample MPT-2-SW-8 and 0.48 mg/l in sample MPT-2-SW-9.

TOC was measured by USEPA Method 415.2 as an estimate of the carbonaceous oxygen demand in the surface water. TOC was not detected in MPT-2-SW-8 and was 2 mg/l in sample MPT-2-SW-9. As a proxy for the more common measure of biological degradable carbonaceous matter in water, BOD₅, TOC is generally an order of magnitude greater than the corresponding BOD₅ value.

Oil and grease concentrations were measured by USEPA Method 413.1, which is an infrared spectrophotometric technique that measures hydrocarbons, vegetable oil, animal fats, waxes, greases, and other related matter. It is a broad measure of hydrocarbons in water. Oil and grease concentrations were 2.8 mg/l in sample MPT-2-SW-9 and 2.0 mg/l in sample MPT-2-SW-8.

Color as measured by USEPA Method 110.2 was 85 APHA units in sample MPT-2-SW-9 and 100 APHA units in sample MPT-2-SW-8. The laboratory-measured pH ranged from 7.2 to 7.4 standard units.

General water quality parameters such as TDS, alkalinity, and hardness indicate that the surface water at SWMU 4 is affected by the estuarine influences of Sherman Creek, Pablo Creek, and Chicopit Bay. This observation is supported by visual indications that parts of the surface water conveyance system within SWMU 4 are tidally influenced, with changes in surface water elevations ranging from approximately 0 to 4 feet depending on distance upstream from the major estuarine features (KBN, 1992; Appendix C). Water quality at the time of sampling was within Class III criteria for the general parameters measured that had standards (Chapter 17-320.530, FAC.)

No VOCs, SVOCs, pesticides, or PCBs were detected in any of the SWMU 4 surface water samples. Samples for inorganic constituents were collected without filtration and were preserved immediately after collection with acid. The metal

results are total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions. The following inorganic elements and compounds were measured in the SWMU 4 surface water samples.

- Estimated concentrations of arsenic were 1.3 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-8 and 4.3 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-9.
- Estimated concentrations of barium were 11.6 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-8 and 11.7 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-9.
- Copper was estimated in sample MPT-2-SW-9 at 24.1 $\mu\text{g}/\text{l}$.
- Lead was estimated in sample MPT-2-SW-9 at 3.2 $\mu\text{g}/\text{l}$.
- Selenium was estimated in sample MPT-2-SW-9 at 2.3 $\mu\text{g}/\text{l}$.
- Vanadium was estimated in sample MPT-2-SW-8 at 6.1 $\mu\text{g}/\text{l}$.
- Zinc was estimated in sample MPT-2SW-8 at 6.3 $\mu\text{g}/\text{l}$.
- Cyanide was estimated in sample MPT-2-SW-9 at 5.4 $\mu\text{g}/\text{l}$.

These data do not indicate surface water contamination by Appendix IX inorganic constituents due to release of contaminants from SWMU 4.

Sediment Sample Results. Sediment samples were collected the week of January 20, 1992, in accordance with the RFI Workplan (U.S. Navy, 1991a,b) at two locations (MPT-2-SD-8 and MPT-2-SD-9) along with the surface water samples. These sample locations were chosen to determine whether contaminants from SWMU 4 were migrating off-site via the surface water conveyance system and accumulating in sediments. Figure 4-39 presents the sediment sample locations and analytical results. Table 4-39 summarizes the detected chemicals in the SWMU 4 sediment samples.

Carbon disulfide, a common byproduct of anaerobic decomposition of organic material, was found in sediment sample MPT-2-SD-8 at an estimated concentration of 3 $\mu\text{g}/\text{kg}$. Di-n-butyl phthalate was also found in sediment sample MPT-2-SD-8 at an estimated concentration of 78 $\mu\text{g}/\text{kg}$. No other VOCs were detected in the sediment samples.

Various polynuclear aromatic hydrocarbons (PAH) were detected in sediment sample MPT-2-SD-9. Phenanthrene was detected at an estimated concentration of 100 $\mu\text{g}/\text{kg}$. Fluoranthene was detected at an estimated concentration of 150 $\mu\text{g}/\text{kg}$. Pyrene was estimated at 100 $\mu\text{g}/\text{kg}$. Chrysene was estimated at 65 $\mu\text{g}/\text{kg}$. A congener of DDT, 4,4'-DDE was detected in sample MPT-2-SD-9 at 1.5 $\mu\text{g}/\text{kg}$. Another congener of DDT, 4,4'-DDD was detected in sample MPT-2-SD-9 at 1.7 $\mu\text{g}/\text{kg}$. DDT was not detected in any of the SWMU 4 sediment samples. Various metals were found in the sediment samples, but not at levels indicating a release of hazardous substances from SWMU 4.

Additional sampling is recommended upstream from the sediment sample location MPT-2-SD-9. This sample had detections of PAHs and was located in the perimeter ditch northeast of SWMU 4. This sample location is near the drainage confluence

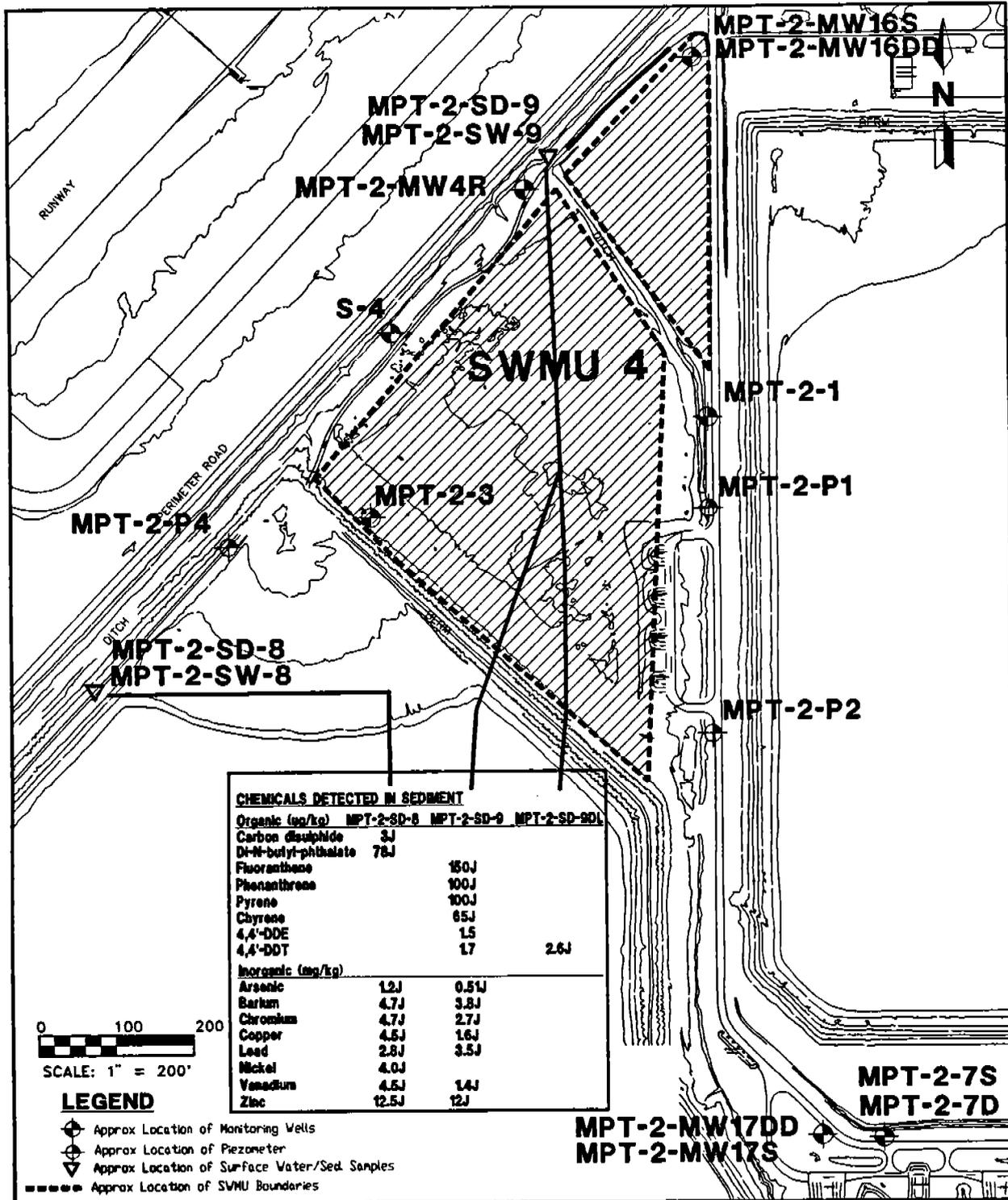


FIGURE 4-39

**SWMU 4 - LANDFILL E
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN SWMU 4 SEDIMENT SAMPLES**



**RCRA FACILITY
INVESTIGATION REPORT
PHASE I**

**U.S. NAVAL STATION
MAYPORT, FLORIDA**

**Table 4-39
Detected Organic and Inorganic Chemicals in SWMU 4 Sediment Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20740		20740		20740	
Sample Matrix:			Sediment		Sediment		Sediment	
Location/Sample No.:			MPT-2-SD-8		MPT-2-SD-9		MPT-2-SD-9DL	
Date Sampled:			01/23/92		01/23/92		01/23/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
84-74-2	Di-n-butyl phthalate	µg/kg	78	J				
75-15-0	Carbon disulfide	µg/kg	3	J				
85-01-8	Phenanthrene	µg/kg			100	J		
206-44-0	Fluoranthene	µg/kg			150	J		
129-00-0	Pyrene	µg/kg			100	J		
218-01-9	Chrysene	µg/kg			65	J		
72-55-9	4,4'-DDE	µg/kg			1.5			
72-54-8	4,4'-DDD	µg/kg			1.7		2.6	J
7440-38-2	Arsenic	mg/kg	1.2	J	0.51	J		
7440-39-3	Barium	mg/kg	4.7	J	3.8	J		
7440-47-3	Chromium	mg/kg	4.7		2.7	J		
7440-50-8	Copper	mg/kg	4.5	J	1.6	J		
7440-92-1	Lead	mg/kg	2.8	J	3.5	J		
7440-02-0	Nickel	mg/kg	4.0	J				
7440-62-2	Vanadium	mg/kg	4.5	J	1.4	J		
7440-66-6	Zinc	mg/kg	12.5	J	12	J		

Notes: Laboratory data validated with NEESA Level C criteria.
 "DL" = in Location/Sample No. indicates a laboratory dilution.
 Conc. = concentration.
 Qual. = qualifier.
 µg/kg = micrograms per kilogram.
 "J" = estimated value.
 mg/kg = milligrams per kilograms.

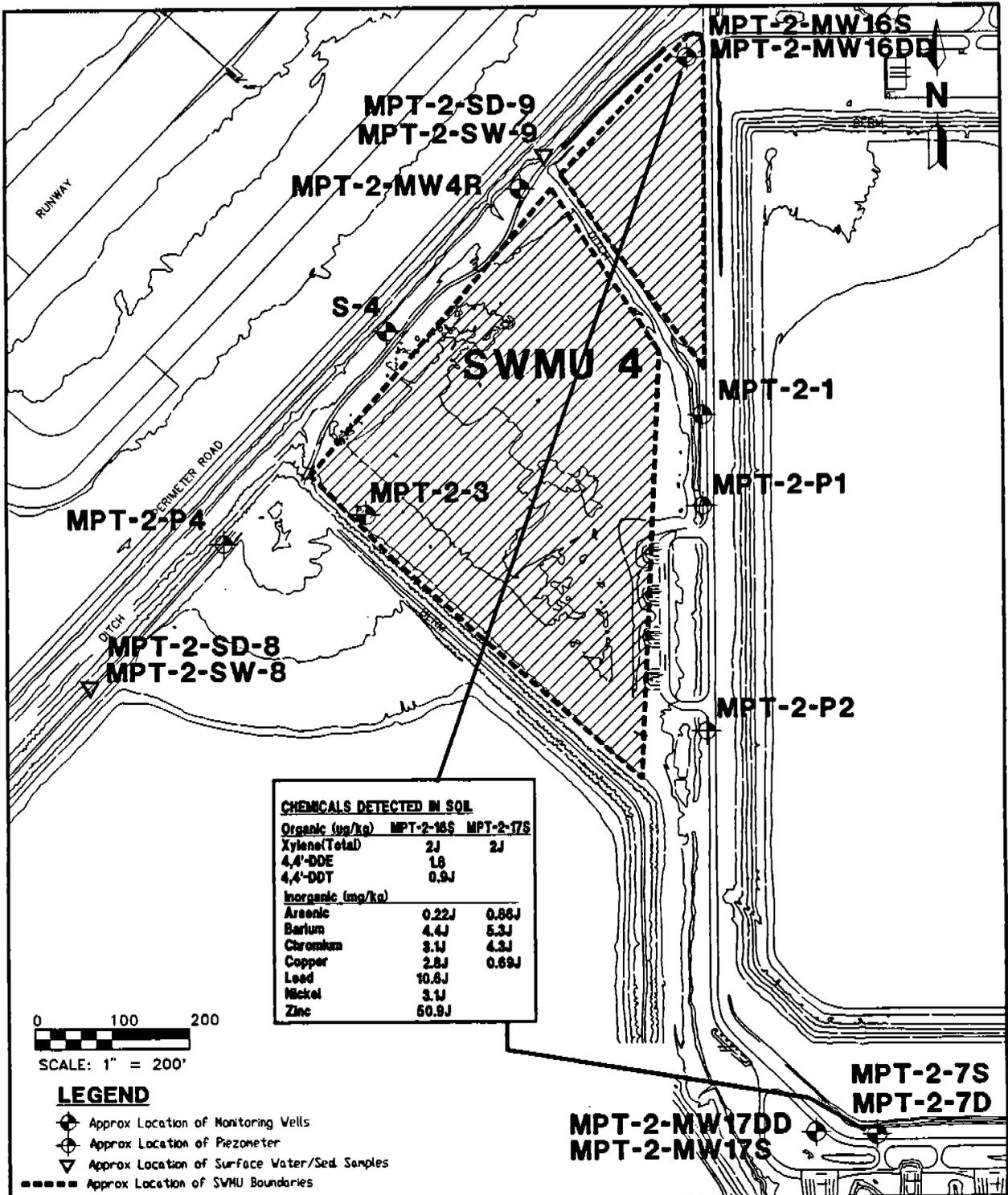
from SWMU 4, and it is recommended that additional samples be collected upstream to confirm whether or not the detected PAH contamination is due to releases from SWMU 4.

Soil Samples. Subsurface soil samples were collected from MPT-2-MW16S and MPT-2-MW17S during well construction. Table 4-40 and Figure 4-40 present the organic and inorganic chemicals detected in this subsurface soil sample. Xylene (total) was estimated at 2 $\mu\text{g}/\text{kg}$ in both samples. No other VOC, SVOC, or PCB was detected in these samples. 4,4'-DDE was detected at 1.8 $\mu\text{g}/\text{kg}$ and in sample MPT-2-MW16S 4,4'-DDT was detected at an estimated concentration of 0.9 $\mu\text{g}/\text{kg}$ and 0.86 $\mu\text{g}/\text{kg}$ in sample MPT-2-MW16S and MPT-2-MW17S, respectively. Various metals were detected, but not at concentrations indicating a release of hazardous substances from SWMU 4.

Groundwater Samples Groundwater in the unconfined surficial aquifer at Mayport is classified Class G-II as defined by Chapter 17-3.403, FAC. Class G-II groundwater is potable-use groundwater in aquifers that have TDS contents of less than 10,000 mg/ℓ , unless otherwise classified. G-II groundwater should meet primary and secondary drinking water quality standards as listed in Chapters 17-550.310 and 550.320, FAC. TDS, as measured by a gravimetric method (USEPA Method 160.1), ranged from 1,640 mg/ℓ in samples MPT-2-MW6-1 and MPT-2-MW16S-1 to 18,900 mg/ℓ in sample MPT-2-MW7D-1. TDS as measured by the gravimetric method is biased low for many of the analyses if compared to an ion balance. Table 4-41 presents values for major water quality parameters measured at SWMU 4 groundwater monitoring wells.

General water quality of the surficial aquifer SWMU 4 is characterized by saline conditions as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely or limited at best. Although the surficial aquifer is classified G-II, secondary standards (Chapter 17.550.320, FAC) are exceeded in most of the surficial wells for TDS, chloride, and sulfate. Maximum contaminant levels as specified in Chapter 17.550.320, FAC, for TDS chloride and sulfate are 500, 250 and 250 mg/ℓ , respectively. Approximate median values in the unconfined surficial aquifer in SWMU 4 for these parameters are 8,000, 6,000, and 700 mg/ℓ , respectively. Reducing conditions were also evident from the presence of sulfide in the surficial aquifer. Anaerobic conditions and the presence of sulfide in the surficial aquifer would reduce the mobility of possible metal contaminants if present.

Tables 4-42 and 4-43 summarize the results for potential chemicals-of-concern detected above quantitation limits in the SWMU 4 groundwater samples. Figure 4-41 also presents groundwater sample locations and laboratory results. Low concentrations of the VOCs carbon disulfide, benzene, chlorobenzene, 1,4-dichlorobenzene, and di-n-butyl phthalate were detected in some of the groundwater samples. No SVOCs, pesticides, or PCBs were detected in any groundwater samples. Inorganic elements and compounds (arsenic, barium, lead, nickel, vanadium, zinc, and cyanide) were detected at low concentrations in groundwater samples. Samples for metals were collected without filtration and were preserved immediately after collection with acid. The metal results are, therefore, total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions.



CHEMICALS DETECTED IN SOIL

Organic (ug/kg)	MPT-2-16S	MPT-2-17S
Xylene(Total)	2J	2J
4,4'-DDE	1.8	
4,4'-DDT	0.9J	
Inorganic (mg/kg)		
Arsenic	0.22J	0.66J
Barium	4.4J	5.3J
Chromium	3.1J	4.3J
Copper	2.8J	0.69J
Lead	10.6J	
Nickel	3.1J	
Zinc	50.9J	

0 100 200
 SCALE: 1" = 200'

LEGEND

- ⊕ Approx Location of Monitoring Wells
- ⊕ Approx Location of Piezometer
- ▽ Approx Location of Surface Water/Sed. Samples
- Approx Location of SWMU Boundaries

FIGURE 4-40
SWMU 4 - LANDFILL E
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN SWMU 4 SOIL SAMPLES



RCRA FACILITY
INVESTIGATION REPORT
PHASE I

U.S. NAVAL STATION
MAYPORT, FLORIDA

**Table 4-40
Detected Organic and Inorganic Chemicals in SWMU 4
Soil Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:		20753		20753		
Sample Matrix:		Soil		Soil		
Location/Sample No.:		MPT-2-16S		MPT-2-17S		
Date Sampled:		01/24/92		01/24/92		
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.
1330-20-7	Xylene (total)	µg/kg	2	J	2	J
72-55-9	4'-DDE	µg/kg	1.8			
50-29-3	4'-DDT	µg/kg	0.9	J	0.86	J
7440-38-2	Arsenic	µg/kg	0.22	J	5.3	J
7440-39-3	Barium	µg/kg	4.4	J	4.3	J
7440-47-3	Chromium	µg/kg	3.1	J	0.69	J
7440-50-8	Copper	µg/kg	2.8	J		
7440-92-1	Lead	µg/kg	10.6	J		
7440-02-0	Nickel	mg/kg	3.1	J		
7440-66-6	Zinc	mg/kg	50.9	J		

Notes: Laboratory data validated with NEESA Level C criteria.
 "DL" = in Location/Sample No. indicates a laboratory dilution.
 Conc. = concentration.
 Qual. = qualifier.
 µg/kg = micrograms per kilogram.
 "J" = estimated value.
 mg/kg = milligrams per kilograms.

**Table 4-41
General Water Quality for SWMU 4 Groundwater Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Method	Analyte	Unit	MPT-2- MW1-1	MPT-2- MW3-1	MPT-2- MW4-1	MPT-2- MW6-1	MPT-2- MW7S-1	MPT-2- MW7D-1	MPT-2- MW16S-1	MPT-2- MW16DD-1
160.1	Total dissolved solids	mg/l	7,010	14,000	2,470	1,640	11,700	18,900	1,640	NR
325.1	Chloride	mg/l	5,240	14,300	478	672	10,900	10,600	594	30,500
376.1	Sulfide	mg/l	<0.1	5.1	2.4	0.2	0.3	1.3	0.9	<0.1
375.4	Sulfate	mg/l	1,070	5.3	547	<1.0	925	1,380	10.2	2,570

Note: mg/l = milligrams per liter.
NR = not reported.

Table 4-42
Detected Organic Chemicals in SWMU 4 Groundwater Samples

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Delivery Group:		20884	20866	20877	20894	20884	20884	20902	
Sample Matrix:		Water		Water		Water		Water	
Location/Sample No.:		MPT-2-MW1-1		MPT-2-MW3-1		MPT-2-MW4-1		MPT-2-MW7D-1	
Date Sampled:		02/11/92		02/09/92		02/10/92		02/11/92	
CAS RN	Common Name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
75-15-0	Carbon disulfide			2	J	3	J		
71-43-2	Benzene					2	J		
108-90-7	Chlorobenzene			10		13			
106-46-7	1,4-Dichlorobenzene			2	J	3	J		
84-74-2	Di-n-butyl phthalate					3	J		

Notes: Laboratory data validated with NEESA Level C criteria.

Conc. = concentration.

Qual. = qualifier.

µg/l = micrograms per liter.

J = estimated value.

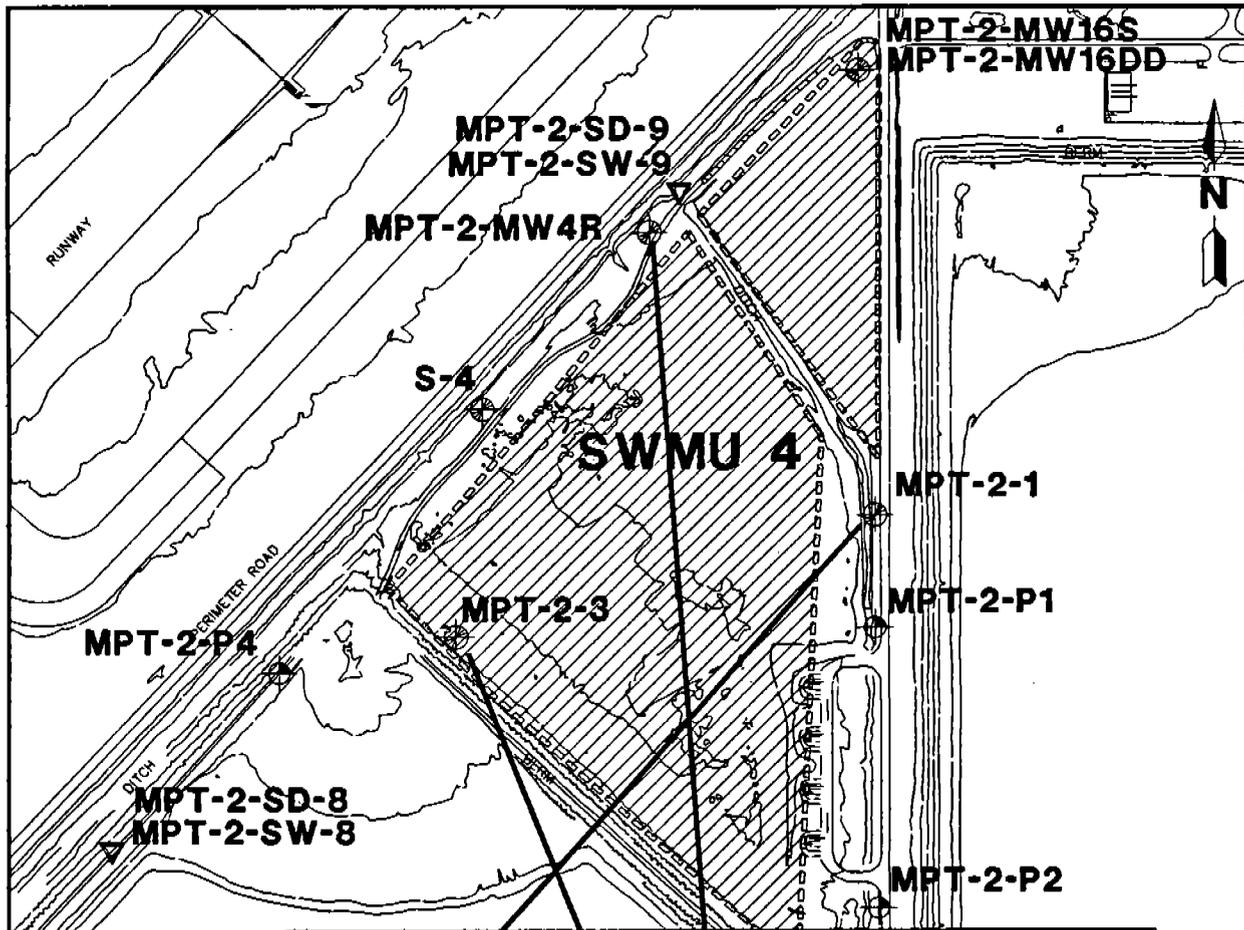
**Table 4-43
Detected Inorganic Chemicals in SWMU 4 Groundwater Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group: Sample Matrix: Location/Sample No.:	Date Sampled:	20884		20866		20877		20884		20884		20902		
		Water		Water		Water		Water		Water		Water		
		MPT-2-MW1-1 02/11/92	MPT-2-MW3-1 02/09/92	MPT-2-MW4-1 02/10/92	MPT-2-MW7S-1 02/11/92	MPT-2-MW7D-1 02/11/92	MPT-2-MW17S-1 02/12/92	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.
CAS RN	Common Name	Units												
7440-38-2	Arsenic	µg/l	6	3.5	45.6	23	J	4	J	14.6	J			
7440-39-3	Barium	µg/l	20.1	82.7	J	18.3	J	34	J	10.3	J			
7440-92-1	Lead	µg/l								5				
7440-02-0	Nickel	µg/l			7.1	11.3	J		J	6.5	J			
7440-62-2	Vanadium	µg/l	9.5	6	9.4	9.8	J	6	J	12.1	J			
7440-66-6	Zinc	µg/l	2.7		5.6	4.5	J	3	J	11.5	J			
5955-70-0	Cyanide	µg/l	3.7	7	9	3.6	J	10.9	J					

Laboratory data validated with NEESA Level C criteria.

Notes: Conc. = concentration.
Qual. = Qualifier.
µg/l = micrograms per liter.
"J" = estimated value.



CHEMICALS DETECTED IN GROUNDWATER						
Organic (ug/D)	MPT-2-MW1-1	MPT-2-MW3-1	MPT-2-MW4-1	MPT-2-MW7S-1	MPT-2-MW7D-1	MPT-2-MW7S-1
Carbon disulphide		2J	3J		3J	
Benzene			2J			
Chlorobenzene		10	13			
1,4-Dichlorobenzene		2J	3J			
Di-n-butyl-phthalate			3J			
Inorganic (ug/D)						
Arsenic	6J	3.5J		23J	4J	14.6
Barium	20.4J	82.7J	45.6J	18.3J	34J	10.3J
Lead						5
Nickel			7.1J	11.3J		6.5J
Vanadium	9.5J	8J	9.4J	9.8J	6J	22.1J
Zinc	2.7J		5.6J	4.5J	3J	11.5J
Cyanide	3.7J	7J	9J	3.8J	10.9	



LEGEND

- ⊕ Approx Location of Monitoring Wells
- ⊕ Approx Location of Piezometer
- ▽ Approx Location of Surface Water/Sed. Samples
- ==== Approx Location of SWMU Boundaries

FIGURE 4-41
SWMU 4 - LANDFILL E
DETECTED ORGANIC AND INORGANIC CHEMICALS IN
SWMU 4 GROUNDWATER SAMPLES



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Carbon disulfide was estimated in sample MPT-2-MW3-1 at 2 $\mu\text{g}/\ell$, in sample MPT-2-MW4-1 at 3 $\mu\text{g}/\ell$, and in sample MPT-2-MW7D-1 at 3 $\mu\text{g}/\ell$. No other VOCs were reported in groundwater samples MPT-2-MW1-1, MPT-2-MW7S-1, MPT-2-7D-1, or MPT-2-MW17S-1. Both MPT-2-MW3-1 and MPT-2-MW4-1 reported estimated values for chlorobenzene and 1,4-dichlorobenzene. Chlorobenzene ranged from 10 $\mu\text{g}/\ell$ (MPT-2-MW3-1) to 13 $\mu\text{g}/\ell$ (MPT-2-MW4-1). 1,4-Dichlorobenzene ranged from 2 $\mu\text{g}/\ell$ (MPT-2-MW3-1) to 3 $\mu\text{g}/\ell$ (MPT-2-MW4-1). Benzene was also estimated in sample MPT-2-MW4-1 at 2 $\mu\text{g}/\ell$. Di-n-butyl phthalate was also estimated in sample MPT-2-MW4-1 at 3 $\mu\text{g}/\ell$.

The following metals were detected in samples collected from SWMU 4.

- Arsenic ranged from an estimated concentration of 3.5 $\mu\text{g}/\ell$ in sample MPT-2-MW3-1 to 23 $\mu\text{g}/\ell$ in sample MPT-2-MW17S-1.
- Estimated barium concentrations ranged from 10.3 $\mu\text{g}/\ell$ in sample MPT-2-MW17S-1 to 82.7 $\mu\text{g}/\ell$ in sample MPT-2-MW3-1.
- Lead was detected in sample MPT-2-MW17S-1 at 5 $\mu\text{g}/\ell$.
- Estimated nickel concentrations ranged from 6.5 $\mu\text{g}/\ell$ in sample MPT-2-MW17S-1 to 11.3 $\mu\text{g}/\ell$ in sample MPT-2-MW7S-1.
- Estimated vanadium concentrations were ranged from 6 $\mu\text{g}/\ell$ in samples MPT-2-MW3-1 and MPT-2-MW7D-1 to 12.1 $\mu\text{g}/\ell$ in sample MPT-2-MW17S-1.
- Estimated zinc concentrations ranged from 2.7 $\mu\text{g}/\ell$ in sample MPT-2-MW1-1 to 11.5 $\mu\text{g}/\ell$ in sample MPT-2-MW17S-1.
- Cyanide concentrations ranged from an estimate of 3.6 $\mu\text{g}/\ell$ in sample MPT-2-MW7S-1 to 10.9 $\mu\text{g}/\ell$ in sample MPT-2-MW7D-1.

The frequency and magnitude of SVOC and metal detections do not indicate a release of hazardous substances to the groundwater at SWMU 4. Although the low levels of VOCs detected in sample MPT-2-3 and MPT-2-4 do not indicate significant groundwater contamination, further monitoring of groundwater at SWMU 4 for VOCs is recommended.

4.8 SWMU 5. LANDFILL F.

4.8.1 SWMU 5 Description Historic information on the permitted solid waste management units at NAVSTA Mayport has been consolidated in the IAS in 1986. The IAS was conducted under the Navy's earlier NACIP program that addressed the CERCLA of 1980. The following information on the disposal activities at SWMU 5, Landfill E, was obtained from this study (ESE, 1986).

SWMU 5 is located east of SWMUs 2, 3, 4, and northeast of the eastern dredge spoils area (Figure 4-42). The landfill was managed by trench and fill and area disposal methods from 1966 to 1985. The landfill consisted of trenches excavated by dragline to about 15-foot wide by 8-foot deep and several hundred-foot long. The trenches were excavated in incremental stages. Construction debris was subsequently placed on top of the old trench and fill areas. The landfill covered approximately 34 acres.

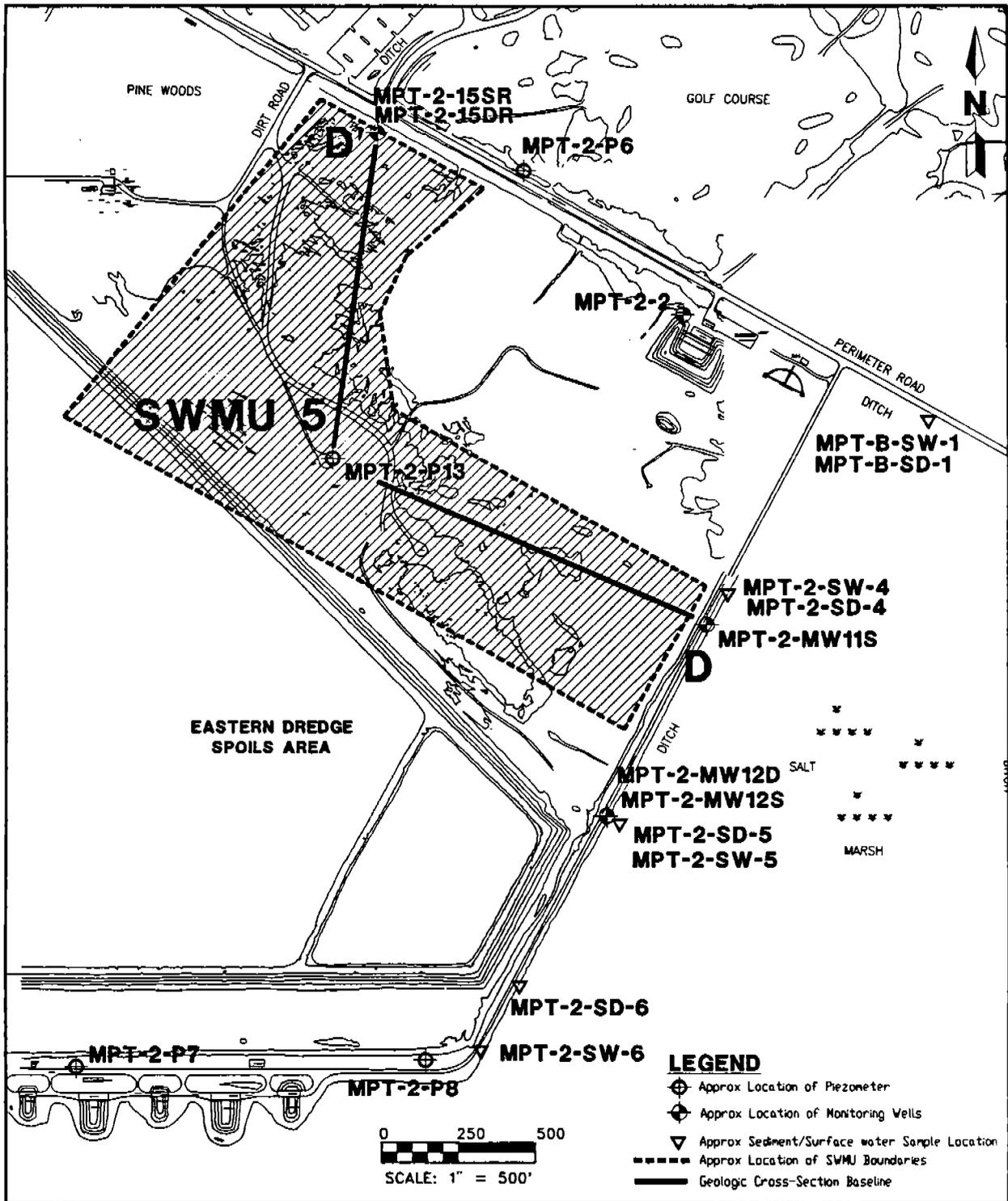


FIGURE 4-42
SWMU 5 - LANDFILL F
SITE PLAN



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The trenches intersected the water table, and waste was deposited into the standing water. Wastes similar to those disposed of in the other landfills were managed at SWMU 5 and included: sanitary wastes, oils, asbestos, paints, toluene, mercury lamps, hydraulic fluids, solvents, sulfuric acid, transformer oil, plating solutions, batteries, pesticide cans, photographic wastes, as well as other materials. The IAS estimated that a total of 200,000 gallons of liquid wastes were disposed at SWMU 5 during its operations. The landfill was graded and covered with topsoil when closed. A part of the site has been enclosed with chain-linked fence and is used as a long-term parking area for vehicles of navy personnel deployed at sea.

4.8.2 Summary of Previous Findings Soil, groundwater, and surface water samples were collected at SWMU 5 and analyzed for Priority Pollutant List compounds during the ESI in 1987. Figure 4-43 presents the sample locations and detected chemicals. No VOCs were detected in soil, groundwater, surface water, or sediment samples collected at SWMU 5. SVOCs detected in groundwater included acenaphthene (35 $\mu\text{g}/\ell$) and bis(2-ethylhexyl) phthalate (20 to 35 $\mu\text{g}/\ell$). A groundwater sample from monitoring well MPT-2-15S contained heptachlor at 0.03 $\mu\text{g}/\ell$. A surface water sample collected during the ESI reported 4,4'-DDE at 0.01 $\mu\text{g}/\ell$. Soils from boring MPT-2-2 reported PCB-1260 at 190 $\mu\text{g}/\text{kg}$. Total lead was detected at 4 $\mu\text{g}/\ell$ in the groundwater sample from monitoring well MPT-2-2.

4.8.3 Summary of Exploration and Sampling Program The exploration program at SWMU 5 included the following data-gathering activities:

- installation of three new surficial monitoring wells, two replacement wells (originally installed during the ESI but subsequently damaged), and three piezometers in the surficial aquifer;
- sampling of subsurface soil during borehole construction for new shallow monitoring wells;
- sampling and analyzing groundwater at new and existing monitoring wells; and
- sampling and analyzing sediment and surface water samples collected from inverts of the storm drain conveyance system.

The locations of these exploration and sampling activities at SWMU 5 are presented in Figure 4-42. Table 4-44 summarizes the type, frequency, and media of samples collected at SWMU 5 during the Phase 1 RFI. The data gathering activities were composed of the field activities described below. Field activities followed the standard operating procedures in project-specific Technical Memoranda located in Appendix B, Site-Specific QAP of the RFI Workplan, Volume II (U.S. Navy, 1991b).

Drilling and Subsurface Soil Sampling. Drilling and subsurface soil sampling were accomplished as described in the Technical Memorandum, Drilling and Subsurface Soil Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b). Borehole locations are shown in Figure 4-42. Soil samples were analyzed by the USEPA SW-846 methods. Selected physical parameters were also measured and included: bulk density (ASTM D2937-83), cation exchange capacity (USEPA Method

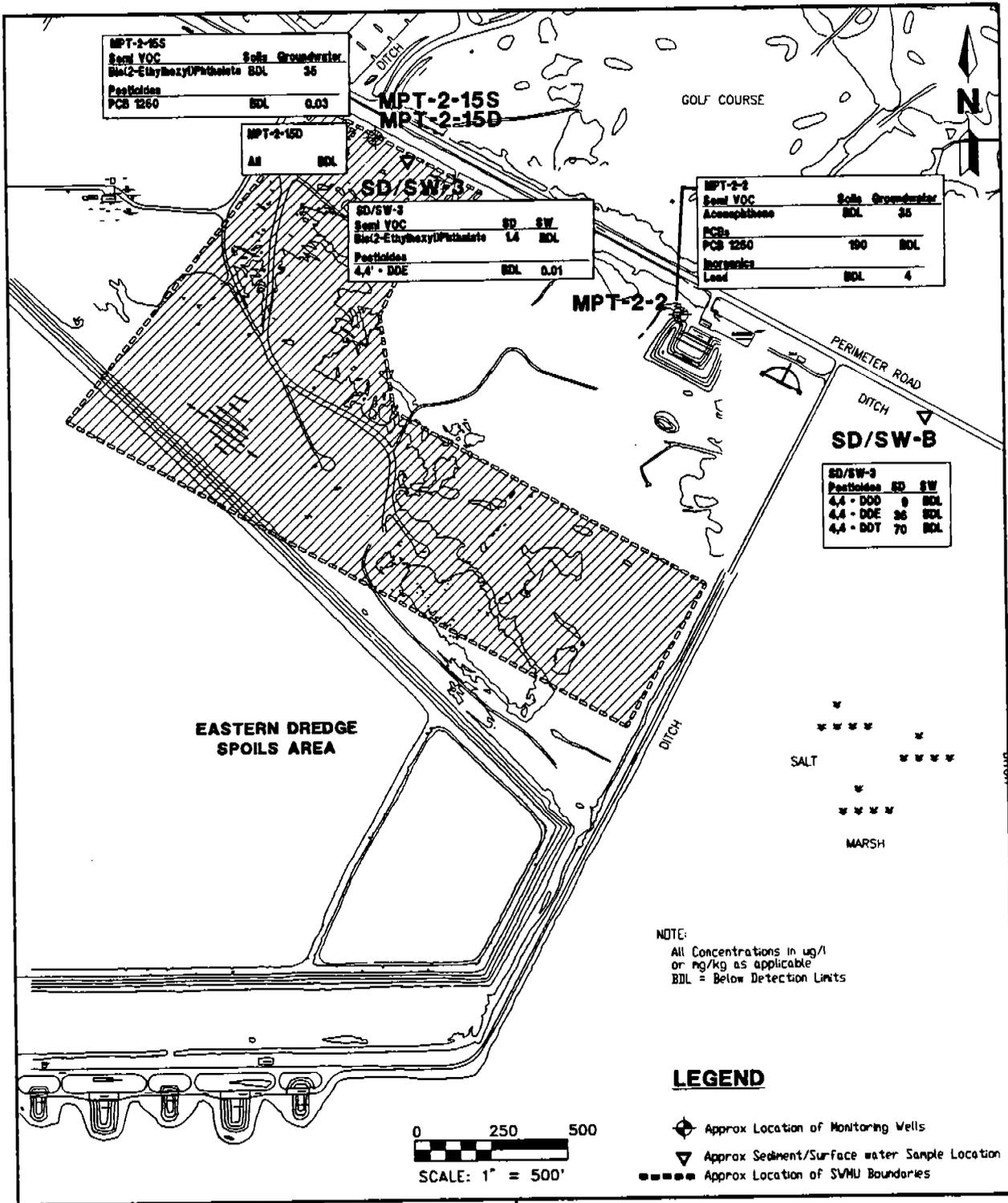


FIGURE 4-43
SWMU 5 - LANDFILL F
EXPANDED SITE INVESTIGATION (ESI)
FINDINGS



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9081), organic content (USEPA Method 9060), soil pH (USEPA Method 9045), particle size distribution (ASTM D422-63), and moisture content ASTM D2216-80).

Table 4-44
Summary of SWMU 5 Chemical Analyses

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Source	Media	U.S. Environmental Protection Agency SW-846 ¹						Totals
		Method 8240 VOC	Method 8270 SVOC	Method 6010, 7470, 7480 Metals	Method 8080 Pest/PCB	General Parameters (soil)	General Water Quality	
SWMU 5	Soil ²	2	2	2	2	2	0	10
	Sediment ²	3	3	3	3	0	0	12
	Groundwater ²	8	8	8	8	0	8	40
	Surface water ²	3	3	3	3	0	3	15

¹ Selected Appendix IX Groundwater Monitoring List Compounds as analyzed by method indicated.

² Includes field duplicate samples.

Notes: VOC = volatile organic compounds.

SVOC = semivolatle organic compounds.

Pest/PCB = organochlorine pesticides and polychlorinated biphenyls.

SWMU = solid waste management unit.

Well Construction and Development. Well and piezometer locations are presented in Figure 4-42. Three new surficial aquifer monitoring wells, two replacement wells, and three new piezometers were installed during Phase 1 field activities at SWMU 5. Table 4-45 summarizes the inventory of wells and piezometers and installation specifications. Well construction and development were accomplished as described in the Technical Memorandum, Well Construction and Development, Appendix B, of the RFI Workplan, Volume II (U.S. Navy, 1991b). Well and piezometer construction details are presented in Appendix A, Volume II of this report.

Groundwater Sampling. Groundwater sampling was accomplished as described in the Technical Memorandum, Groundwater Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b). A total of eight groundwater samples (including duplicate samples) were collected, one from each of the existing and new monitoring wells. Samples were analyzed by specified USEPA SW-846 methods. Selected general water quality parameters were also measured in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983).

Sediment and Surface Water Sampling. Three sediment and three surface water samples were collected from the drainage system at SWMU 5. Sediment and surface water sampling locations are shown in Figure 4-42. Sediment and surface water sampling was accomplished as described in the Technical Memorandum, Sediment and Surface Water Sampling, Appendix B in the RFI Workplan, Volume II (U.S. Navy, 1991b) and as summarized in Chapter 3.0 of this report.

Table 4-45
Summary of SWMU 5 Piezometer and Monitoring Well Installations

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU Number	Piezometer and Monitoring Well No.	Phase	Diameter (inches)	Total Depth (feet)	Screened Interval (feet bls)
5	MPT-2-2	ESI	2	10	3 - 10
	MPT-2-P6	Phase 1 RFI	2	10	5 - 10
	MPT-2-P8	Phase 1 RFI	2	10	5 - 10
	MPT-2-P13	Phase 1 RFI	2	10	5 - 10
	MPT-2-MW11S	Phase 1 RFI	2	11	2 - 12
	MPT-2-MW12D	Phase 1 RFI	2	24.5	14 - 24
	MPT-2-MW12S	Phase 1 RFI	2	12	2 - 12
	MPT-2-MW15DR	ESI/Phase 1 RFI	2	25	15 - 25
	MPT-2-MW15SR	ESI/Phase 1 RFI	2	15	5 - 15

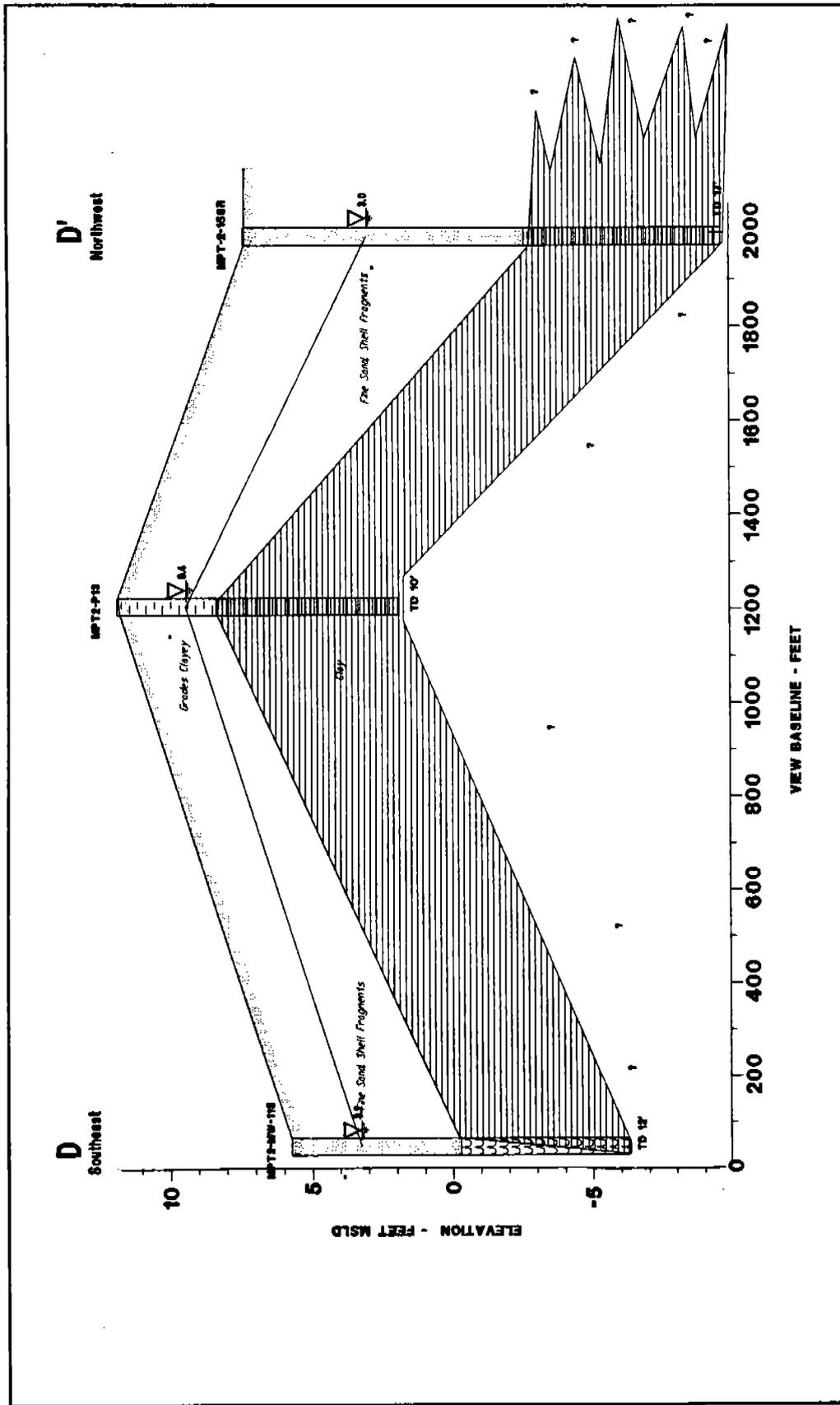
Notes: SWMU = solid waste management unit.
bls = below land surface.
ESI = Expanded Site Investigation; E.C. Jordan; conducted September 1987 to October 1987.
Phase 1 RFI = Phase 1 RCRA Facility Investigation; ABB Environmental Services; conducted January 1992 to March 1992.

4.8.4 Environmental Setting Sediment, surface water, subsurface soil, and groundwater are the media of concern at SWMU 5 based on the release scenario described above and analytical results from the ESI. This section summarizes the geological and hydrogeological factors affecting contaminant fate and migration in these media at SWMU 5.

4.8.4.1 Geology This section describes the geological setting observed at SWMU 5 during the Phase 1 RFI. The Upper Hawthorn Group structure at the site is deduced from the deep borings made at SWMU 3 and south of SWMU 4. Physical characteristics of soils measured at SWMU 5 that affect contaminant migration are also presented in this section.

Geological Setting. Figure 4-44 shows a cross section summarizing the SWMU 5 geology. The cross section was composed from boring log data from new and existing monitoring wells and piezometers installed at SWMU 5. The cross section illustrates features typical of the Group I SWMUs. The uppermost unit consists of a surficial deposit of material dredged from the Mayport turning basin and the St. Johns River. Typically, beneath the surficial dredge material, a uniform, poorly graded, well sorted, sand (SP) with lenses of a very soft grey to dark-grey silty clay (CH, CM) are found. This sand unit, termed in the cross section undifferentiated post-Hawthorn deposits, grades at depth into the third unit, the Coosawhatchie Formation of the Upper Hawthorn Group (Scott, 1988).

Physical Characteristics of Soil. Grain-size distribution analyses show that all samples consisted mainly of poorly graded fine-grained sand (Table 4-46). Samples MPT-2-12S and MPT-2-15S consisted of 95 percent fine-grained sand. MPT-2-11S consisted of 90 percent fine-grained sand. An estimated effective porosity range of 0.25 to 0.35 appears reasonable (0.35 is used for the estimation of average groundwater velocities) for the sands of the surficial aquifer at SWMU 5. The organic content (less than 1 percent) and ion exchange capacity (less



LEGEND
TD = Total Depth

FIGURE 4-44
SWMU 5 - LANDFILL F
CROSS SECTION D - D'



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Table 4-46
SWMU 5 Soil Uniformity Coefficients

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample	Percent Sand			Uniformity Coefficient Cu ¹
	F	M	C	
MPT-2-12S	95			1.9
MPT-2-15S	95			1.5
MPT-2-11S	90			2.0

¹ Cu = D₆₀/D₁₀
Cu < 4 = well sorted, poorly graded.
Cu > 6 = poorly sorted, well graded.

Notes: F = fine.
M = medium.
C = coarse.

than 1.4 milliequivalents per 100 grams) of the soils are relatively low as summarized in Table 4-47. This implies that retardation of contaminants in groundwater flow will be small and, therefore, soluble contaminants will travel at approximately the same velocity as the groundwater.

Table 4-47
SWMU 5 Physical Soil Characteristics

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Matrix:	Soil	Soil
Location/Sample No.:	MPT-2-11S	MPT-2-12S
Analyte		
Percent moisture	15.1	18.5
Soil bulk density	1.39	1.38
Cation exchange capacity	5	2.1
pH	7.57	7.91
TOC	2,800	1,140

Notes: Soil bulk density = grams per cubic centimeter.
Cation exchange capacity = milliequivalents per 100 grams.
pH = standard units.
TOC = total organic carbon in milligrams per liter.

4.8.4.2 Hydrogeology The hydrogeologic investigations conducted at SWMU 5 during the Phase I RFI collected data to characterize the potentiometric surface of the water table aquifer, estimate the hydraulic conductivities, and compute

the average velocity of the groundwater flow in the uppermost aquifer at the site. These parameters were estimated based on synoptic water table elevations, *in-situ* permeability testing (i.e., slug-tests), and soil characteristics of the aquifer formation. Darcy's Law was used to estimate average groundwater flow velocities.

Slug Test Both rising- and falling-head slug tests were conducted at selected SWMU 5 piezometers and monitoring wells depending on the screened intervals of the piezometers and their location relative to the water table. As many as six trials were conducted at each location in order to provide an average of the estimated hydraulic conductivities (K) of the aquifer in the vicinity of the screened intervals. From the multiple trials, the precision of the K data was also evaluated. These data are presented in Table 4-48 for SWMU 5.

Table 4-48
***In-Situ* Hydraulic Conductivities at SWMU 5**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU	Well/Piezometer	Runs	Range of K (feet/day)	Median K (feet/day)	Average K (feet/day)	Screen Interval (feet bls)
5	MPT2-P6	6	5.897 - 6.419	6.175	6.159	5 - 10
5	MPT2-P8	6	3.976 - 5.995	4.589	4.471	5 - 10
5	MPT2-MW-15DR	6	9.831 - 14.043	13.078	12.454	15 - 25
5	MPT2-MW-12D	5	36.187 - 50.558	46.022	44.769	20 - 25

Note: Runs are slug-test data retrieval events.
bls = below land surface.

Piezometer MPT-5-P6 had a median *in-situ* conductivity of approximately 6.2 feet per day. This piezometer was screened within the surficial aquifer between 5 to 10 feet bls in silty, gray sands. MPT-2-12D had a median *in-situ* conductivity of approximately 46.0 feet per day. This monitoring well was screened in the surficial aquifer between 14 to 24 feet bls in fine-grained silty sand grading into gravel-sized shell fragments. MPT-2-15DR had a median *in-situ* conductivity of approximately 13.1 feet per day. This monitoring well was screened in the surficial aquifer between 15 to 25 feet bls in medium-grained sand grading into clay to clayey sands (Volume II, Appendix A, Boring Logs).

Groundwater Gradient and Flow Velocity Water table elevations were measured on February 16, March 25, and April 20, 1992, for selected piezometer and monitoring wells throughout NAVSTA Mayport. Groundwater measurements were obtained specifically from five piezometers and six monitoring wells at SWMU 5. The measurements were achieved within a 4-hour period during each measurement event. Table 4-49 presents the water table measurements at SWMU 5 for these three measurement events.

Facility-wide water table surface maps were developed for each monthly measurement event to provide a synoptic view of the water table surface

Table 4-49
Summary of SWMU 5 Water Level Data

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Well/Piezometer	X Eastings State Plane ¹	Y Northings State Plane ¹	Z Elev. (MSL)	Water Level 02/16/92			Water Level 03/25/92			Water Level 04/20/92			Avg. Elev. ² (MSL)	Depth Standard Deviation ³
				Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)		
MPT-2-2	368573.739	2199855.356	7.56	02:22 pm	3.45	4.11	01:59 pm	3.47	4.09	06:40 pm	3.61	3.95	4.05	0.07
MPT-2-MW-12D	368319.800	2198211.851	5.42	01:20 pm	3.50	1.92	03:24 pm	3.15	2.27	05:27 pm	3.07	2.35	2.18	0.19
MPT-2-MW-12S	368318.326	2198209.618	5.51	01:25 pm	3.80	1.71	03:24 pm	3.19	2.32	05:25 pm	3.25	2.26	2.10	0.27
MPT-2-P13	367408.890	2199402.723	11.87	NM	NM		NM	NM		04:15 pm	2.49	9.38	9.38	0.00
MPT-2-15-SR	367584.874	2200460.565	6.65	12:30 pm	3.45	3.20	02:09 pm	3.67	2.98	04:10 pm	3.79	2.86	3.02	0.14
MPT-2-15-DR	367585.292	2200457.999	6.89	12:38 pm	3.80	3.09	02:10 pm	3.96	2.93	04:11 pm	4.05	2.84	2.95	0.10
MPT-2-MW-11S	368644.337	2198829.883	5.73	01:14 pm	2.40	3.33	03:17 pm	2.27	3.46	05:35 pm	3.02	2.71	3.16	0.33
MPT-2-P8	367731.872	2197416.959	6.35	01:20 pm	3.50	2.85	03:28 pm	3.4	2.95	05:15 pm	3.35	3.00	2.93	0.06
MPT-2-P7	366597.014	2197396.923	7.95	01:25 pm	3.80	4.15	03:32 pm	3.9	4.05	05:10 pm	4.00	3.95	4.05	0.08
MPT-2-P6	367964.790	2200321.549	5.10	02:20 pm	2.80	2.30	03:04 pm	4.42	0.68	06:35 pm	2.86	2.24	1.74	0.75

¹Florida State Plan Coordinate System.

²Arithmetic average of all water level measurements for each well.

³Standard deviation of all water level measurements for each well.

Notes: Elev. = elevation.

MSL = mean sea level.

LCL = local.

TOC = top of casing.

NM = not measured.

throughout NAVSTA Mayport. Because no significant monthly variation was observed on a facility-wide basis (the coefficient of variation of groundwater elevations were less than 1), an average water table surface map was developed using the measurements from all three groundwater elevation survey events. The estimated water table surface map for SWMU 5 using both SWMU-specific and facility-wide synoptic data is presented in Figure 4-45. Minor variations existed in water elevations between shallow and deep surficial wells clustered at MPT-2-12S/D and MPT-2-15S/D. These wells are near tidally affected surface water and they also appear to be moderately influenced by tidal effects. Differences in water elevations may be a result of lags in tidal response between the clustered wells and not indicative of a perched water table condition.

Selected NAVSTA Mayport groundwater wells and piezometers were monitored over a 48-hour period in February 1992 to observe possible influences from tidal effects. Wells located away from tidally influenced water bodies (greater than 100 feet) were minimally affected by tidal fluctuations. Groundwater response in these wells was weak to non-existent. MPT-2-MW12S was monitored during this study and a time-series plot of the data is presented in Figure 4-46. Tidal influence on the water table aquifer at MPT-2-MW12S is measurable and varies over a range of approximately 3 inches. This effect is expected to diminish with distance from tidally influenced surface waters.

Average groundwater velocities were calculated based on Darcy's Law using estimates of porosity, permeability, and aquifer gradients (based on synoptic water table elevations) obtained from the field and laboratory observations. Table 4-50 summarizes the parameters and estimated velocities. Flow velocities appear higher in the lower parts of the surficial aquifer due to the higher conductivities measured in the deeper zones.

Table 4-50
Estimation of Average Groundwater Velocities at SWMU 5
Based on Darcy's Law

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Location	Estimated Effective Porosity	Hydraulic Conductivity feet/day	Estimated Gradient feet/foot	Calculated Average Velocity feet/day	Estimated Average Velocity feet/day
MPT-2-P6	0.35	6.2	0.0067	0.1187	0.12
MPT-2-15D	0.35	13.1	0.0067	0.2508	0.25
MPT-2-P13	0.35	6.2 ¹	0.0083	0.1470	0.15
MPT-2-12D	0.35	46.0	0.0067	0.8806	0.90

¹ Estimated based on in-situ conductivity measurement at MPT-2-P6 during the Phase 1 RFI, February 1992.

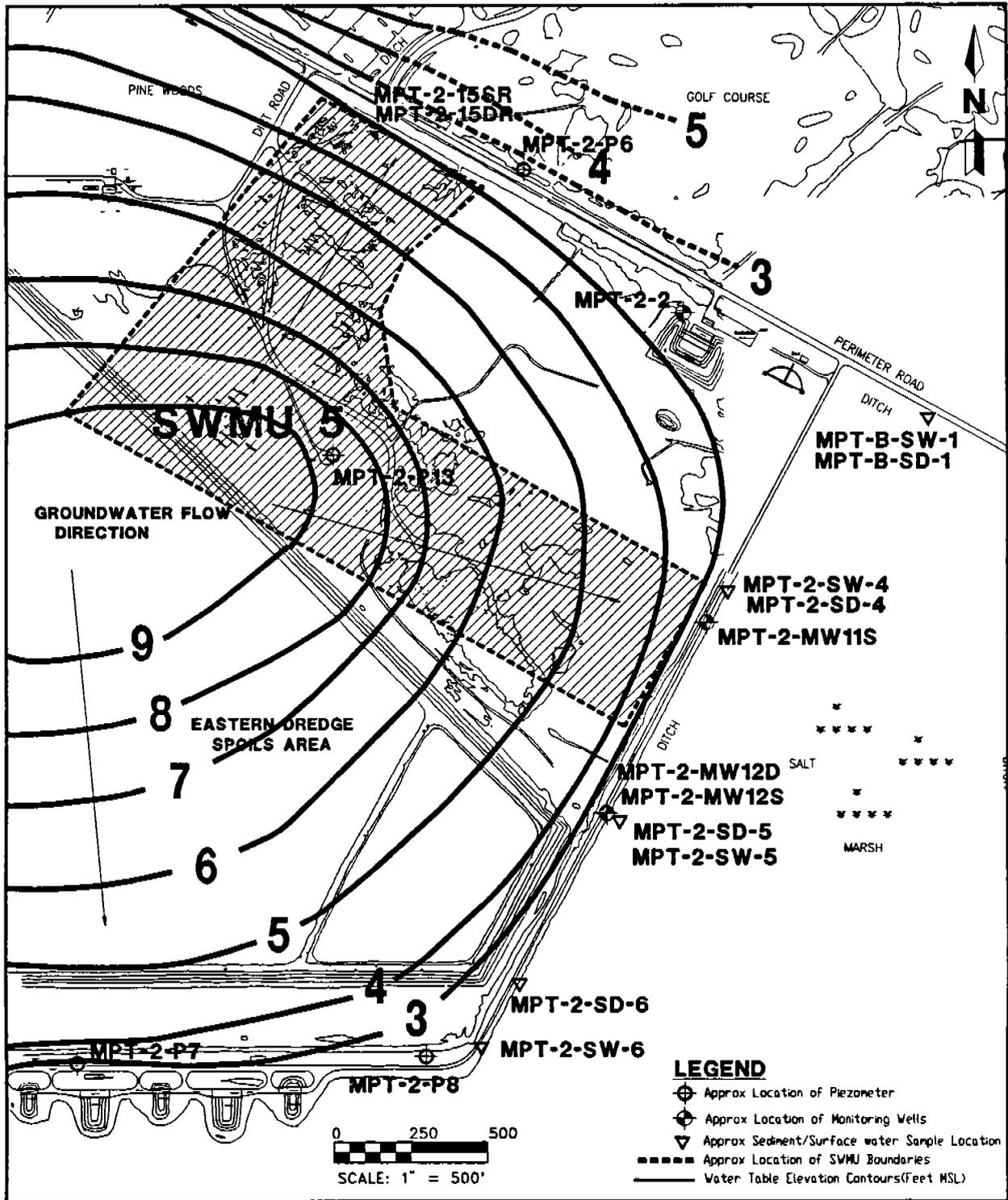


FIGURE 4-45
SWMU 5 - LANDFILL F
WATER TABLE SURFACE MAP

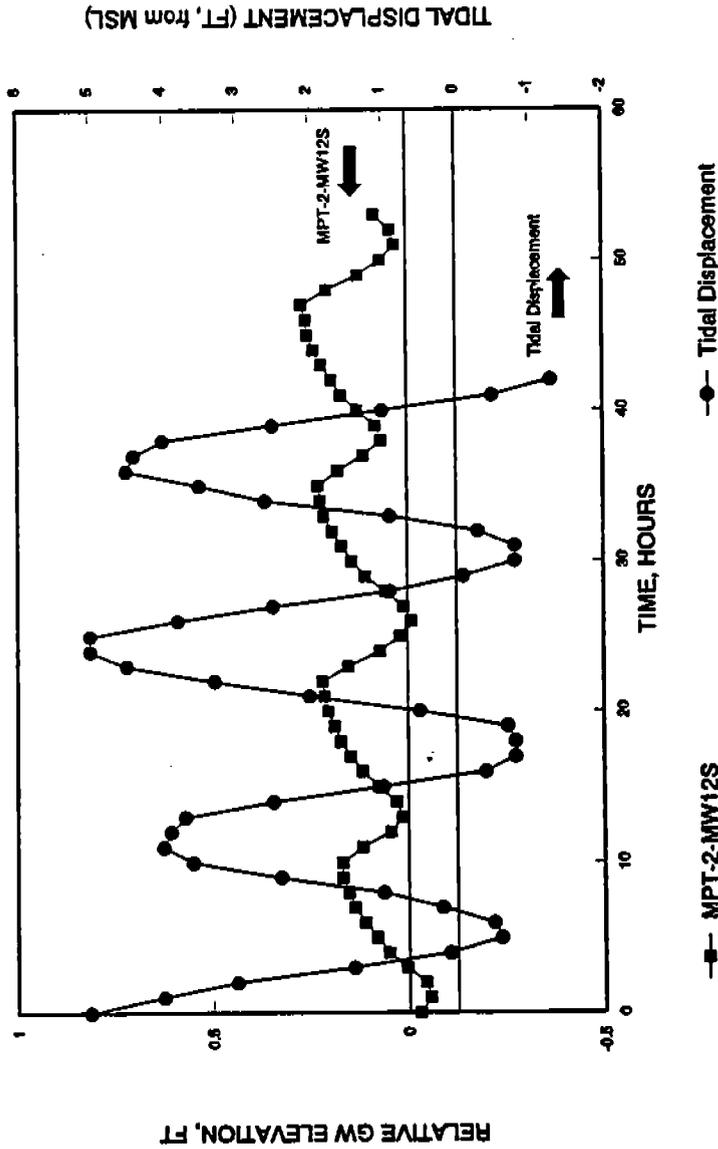
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TIDAL STUDY DATA - GROUP I

START: 0600, 2/15/92



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FIGURE 4-46
TIDAL STUDY DATA FOR GROUP I
LANDFILL F, SWMU 5
MONITORING WELL MPT-2-MW12S

4.8.5 Release Characteristics This section describes the extent of contamination observed at SWMU 5, Landfill E, during the Phase 1 RFI. Investigations described in this section of the report include: sediment investigation, surface water investigation, subsurface soil investigation, and groundwater investigation.

The samples of environmental media (sediments, surface water, soil, and groundwater) were analyzed for organic and inorganic constituents by USEPA SW-846 Methods 8240 (VOCs), 8270 (SVOCs), 8080 (organochlorine pesticides and PCBs), 6010 (metals by ICP), 7420 (metals by GFAA), 7470 (metals by CVAA), and 9010 (cyanide).

The laboratory data for the selected Appendix IX analyses were validated in accordance with NEESA Level C requirements (NEESA, 1988) to determine data of known quality for site characterization and risk assessment. The data were either accepted without qualification, accepted as estimated values, or rejected. Chapter 3.0 discusses the data validation findings, and data validation narratives are presented in Volume III, Appendix E.

Groundwater samples were also analyzed in the laboratory for the following general water quality parameters: TDS, chloride, alkalinity (as CaCO_3), hardness (as CaCO_3), sulfate, sulfide, TKN, ammonia (total), nitrite and nitrate, total phosphorous, TOC, oil and grease, color, and pH.

Analyses were conducted in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983). These are non-CLP methodologies, and general water quality samples were collected and analyzed in accordance with NEESA Level E guidelines (NEESA, 1988).

Surface Water Sample Results. Surface water samples were collected the week of January 20, 1992, in accordance with the RFI Workplan (U.S. Navy, 1991a,b) at three locations (MPT-2-SW-4, MPT-2-SW-5, and MPT-2-SW-6). These sample locations were chosen to determine whether contaminants from SWMU 5 were migrating off-site via the surface water conveyance system. Figure 4-47 presents the surface water sample locations and analytical results. Table 4-51 summarizes the detected chemicals in the SWMU 5 surface water samples.

Surface water around Mayport south of the St. Johns River is classified as Class III Waters for Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife (Chapter 17-302.560, FAC). Bar-chart summaries of measured surface water quality parameters for each sample are presented in Figures 4-48 through 4-50.

TDS, as measured by a gravimetric method (USEPA Method 160.1), ranged from 5,830 mg/l in sample MPT-2-SW-5 to 10,700 mg/l in sample MPT-2-SW-4. The TDS is biased low if compared to an ion balance. The surface water at SWMU 5 is moderately saline and general water quality is influenced by the estuarine character of Sherman Creek, Pablo Creek, and Chicopit Bay.

Sulfate and chloride were the dominant anions. Sulfate (SO_4^{--}), a common form of sulfur found in oxygenated conditions, ranged from 552 mg/l in sample MPT-2-SW-6 to 828 mg/l MPT-2-SW-4. Sulfide (S^{--}) is a form of reduced sulfur often found under anaerobic conditions. No sulfide was found in any samples above the

method detection limit (<0.1 mg/l). Chloride ranged from 7,260 mg/l in sample MPT-2-SW-6 to 10,800 mg/l in sample MPT-2-SW-4. The surface waters at SWMU 5 meet the conditions for predominantly marine water as defined in Chapter 17-302.200, FAC (chloride $\geq 1,500$ mg/l).

Alkalinity (as CaCO_3) ranged from 200 mg/l in sample MPT-2-SW-4 to 1,254 mg/l in sample MPT-2-SW-6. Hardness (as CaCO_3) ranged from 1,430 mg/l in sample MPT-2-SW-6 to 2,110 mg/l in sample MPT-2-SW-4, which is the "hard" range for natural waters.

Surface water nutrient compounds measured during Phase 1 field activities included nitrogen and phosphorous. Nitrogen species included ammonia (total), TKN, and total nitrites and nitrates. Ammonia was analyzed using USEPA Method 350.2, which reports both un-ionized ammonia and ammonium ion. TKN was measured using USEPA Method 351.3. Nitrite and nitrate nitrogen were measured by USEPA Method 353.2.

Because all nitrogen forms were not detected at all locations, total nitrogen was estimated as the sum of TKN and nitrite and nitrate and used as a basis for comparison between sample locations. Typical total nitrogen concentrations locations ranged from 1.45 mg/l (MPT-2-SW-4) to 2.09 mg/l (MPT-2-SW-6). Ammonia was not detected in any SWMU 5 surface water samples.

Phosphorus was measured by USEPA Method 365.1, which determines total phosphorus including elemental phosphorus, orthophosphorus, and hydrolyzable (organic) phosphorus. Total phosphorus ranged from 0.69 mg/l in sample MPT-2-SW-4 to 1.05 mg/l in sample MPT-2-SW-6.

TOC was measured by USEPA Method 415.2 as an estimate of the carbonaceous oxygen demand in the surface water. Values ranged from 8.6 mg/l (MPT-2-SW-5) to 31 mg/l (MPT-2-SW-4). As a proxy for the more common measure of biological degradable carbonaceous matter in water, BOD_5 , TOC is generally an order of magnitude greater than the corresponding BOD_5 value.

Oil and grease concentrations are measured by USEPA Method 413.1, which is an infrared spectrophotometric technique that measures hydrocarbons, vegetable oil, animal fats, waxes, greases, and other related matter. It is a broad measure of hydrocarbons in water. Oil and grease concentrations ranged from 1.5 mg/l in sample MPT-2-SW-5 to 3.4 mg/l in sample MPT-2-SW-4.

Color as measured by USEPA Method 110.2 ranged from 100 APHA units in sample MPT-2-SW-4 to 140 APHA units in samples MPT-2-SW-5 and MPT-2-SW-6. The laboratory-measured pH ranged from 7.4 to 7.5 standard units.

General water quality parameters such as TDS, alkalinity, and hardness indicate that the surface water at SWMU 5 is affected by the estuarine influences of Sherman Creek, Pablo Creek, and Chicopit Bay. This observation is supported by visual indications that parts of the surface water conveyance system within SWMU

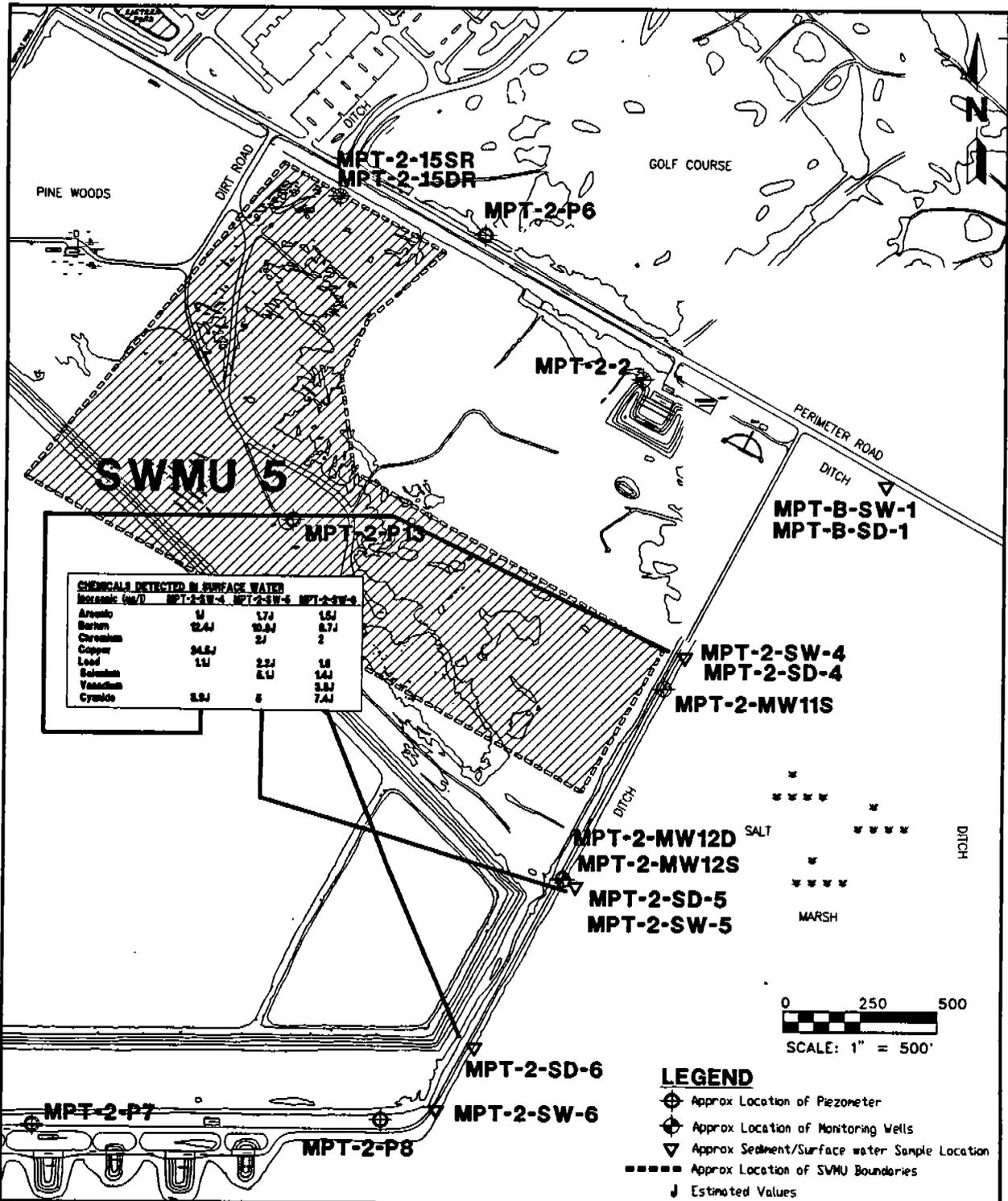


FIGURE 4-47
SWMU 5 - LANDFILL F
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN SURFACE WATER



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**Table 4-51
Detected Inorganic Chemicals in SWMU 5 Surface Water Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20722		20722		20722	
Sample Matrix:			Water		Water		Water	
Location/Sample No.:			MPT-2-SW-4		MPT-2-SW-5		MPT-2-SW-6	
Date Sampled:			01/22/92		01/21/92		01/22/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
7440-38-2	Arsenic	$\mu\text{g}/\text{l}$	1	J	1.7	J	1.5	J
7440-39-3	Barium	$\mu\text{g}/\text{l}$	12.4	J	10.9	J	9.7	J
7440-47-3	Chromium	$\mu\text{g}/\text{l}$			2	J	2	J
7440-50-8	Copper	$\mu\text{g}/\text{l}$	24.5	J				
7440-92-1	Lead	$\mu\text{g}/\text{l}$	1.1	J	2.2	J	1.6	J
7440-49-2	Selenium	$\mu\text{g}/\text{l}$			5.1	J	1.4	J
7440-62-2	Vanadium	$\mu\text{g}/\text{l}$					3.8	J
5955-70-0	Cyanide	$\mu\text{g}/\text{l}$	3.9	J	5	J	7.4	J

Notes: Laboratory data validated with NEESA Level C criteria.
 Conc. = concentration.
 Qual. = qualifier.
 $\mu\text{g}/\text{l}$ = micrograms per liter.
 "J" = estimated value.

MAYPORT RCRA FACILITY INVESTIGATION

Surface Water Sample Location MPT-2-SW-4

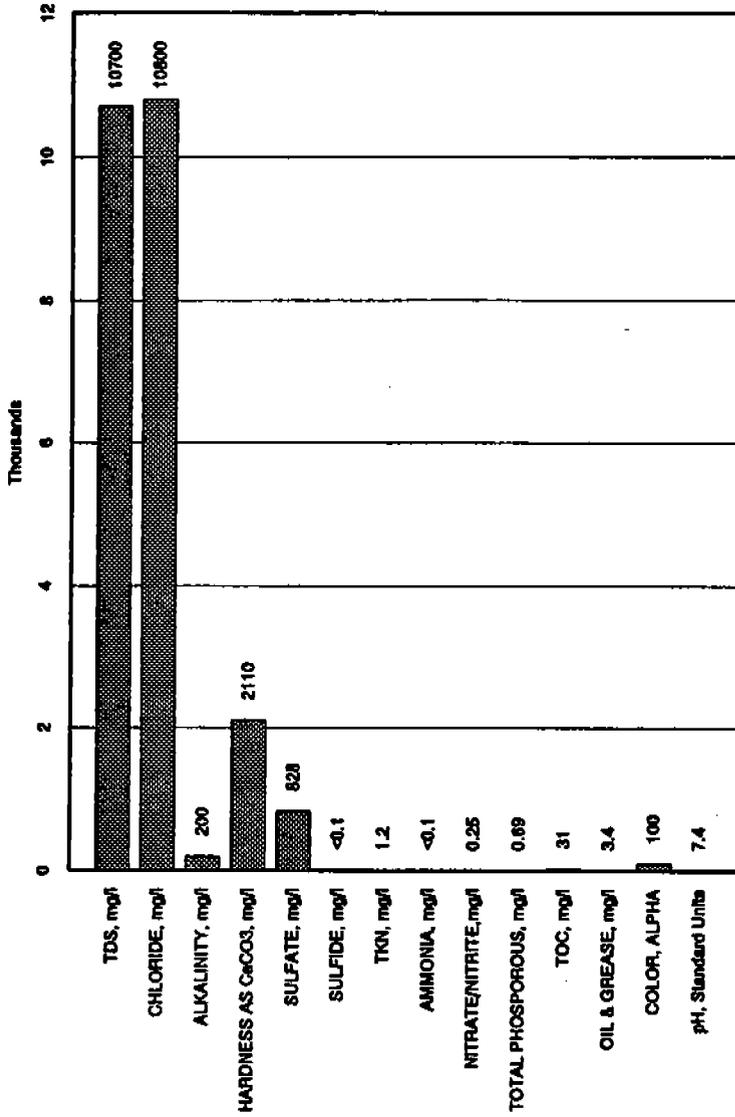
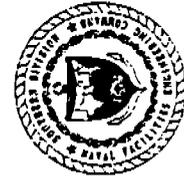


FIGURE 4-48
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-4



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MAYPORT RCRA FACILITY INVESTIGATION

Surface Water Sample Location MPT-2-SW-5

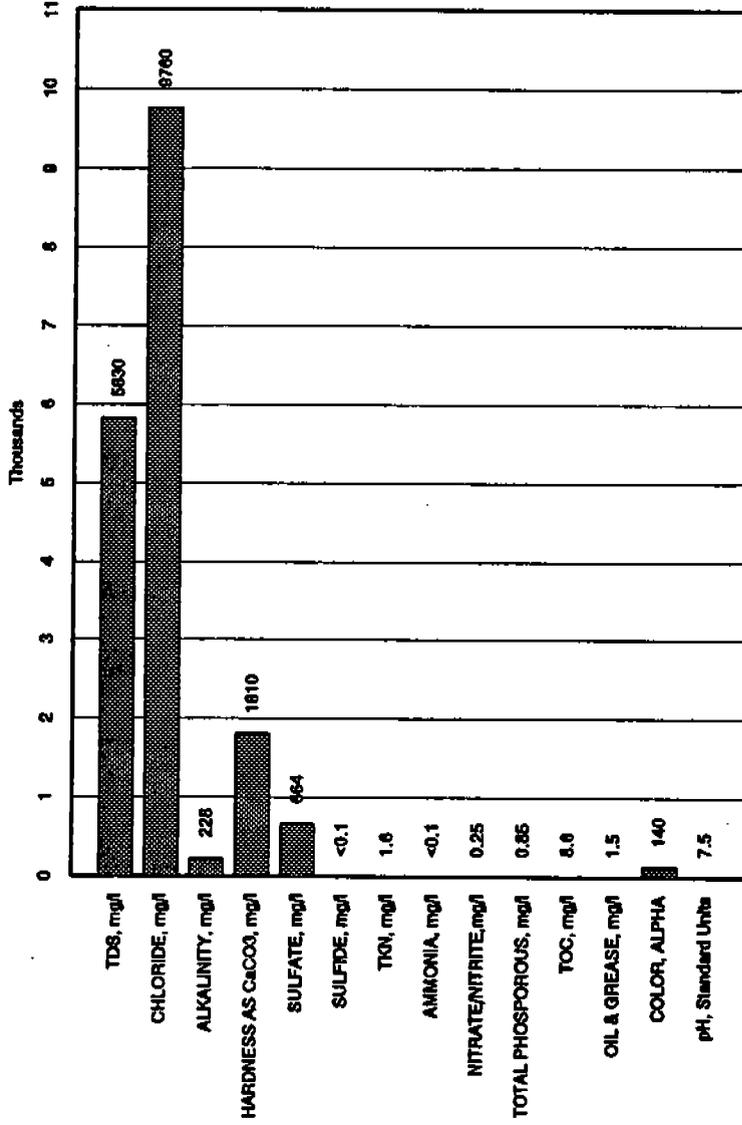


FIGURE 4-49
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-5



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Surface Water Sample Location MPT-2-SW-6

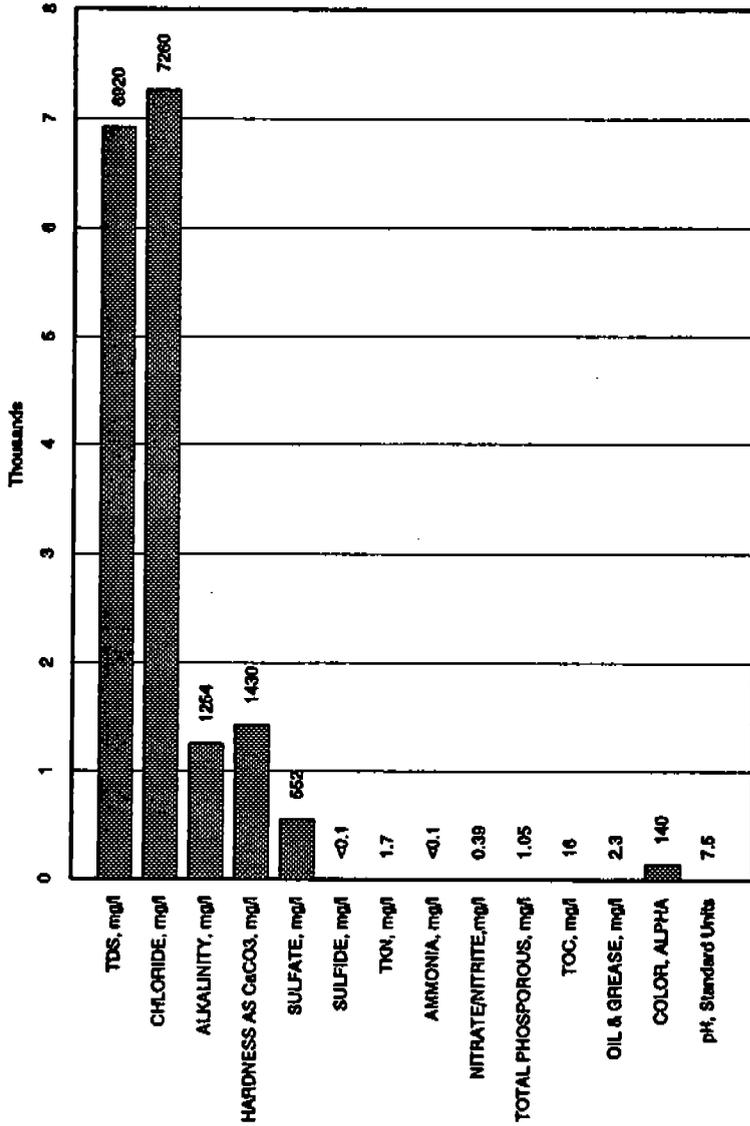


FIGURE 4-60
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-6



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5 are tidally influenced, with changes in surface water elevations ranging from approximately 0 to 4 feet depending on distance upstream from the major estuarine features (KBN, 1992; Appendix C).

Water quality at the time of sampling was within Class III criteria for the general parameters measured that had standards (Chapter 17-320.530, FAC).

No VOCs, SVOCs, pesticides, or PCBs were detected in any of the SWMU 5 surface water samples. Samples for inorganic constituents were collected without filtration and were preserved immediately after collection with acid. The metal results are total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions. The following inorganic elements and compounds were measured in the SWMU 5 surface water samples.

- Estimated concentrations of arsenic ranged from 1 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-4 to 1.7 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-5.
- Estimated concentrations of barium ranged from 9.7 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-6 to 12.4 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-4.
- Estimated concentrations of chromium were detected at 2 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-5 and MPT-2-SW-6.
- Copper was estimated in sample MPT-2-SW-4 at 24.5 $\mu\text{g}/\text{l}$.
- Estimated concentrations of lead ranged from 1.1 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-4 to 2.2 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-5.
- Estimated concentrations of selenium ranged from 1.4 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-6 to 5.1 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-5.
- Vanadium was estimated in sample MPT-2-SW-6 at 3.8 $\mu\text{g}/\text{l}$.
- Estimated concentrations of cyanide ranged from 3.9 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-4 to 7.4 $\mu\text{g}/\text{l}$ in sample MPT-2-SW-6.

Only cyanide (in sample MPT-2-SW-6) was detected at concentrations exceeding the Class III surface water quality standard for marine water. These data do not indicate surface water contamination by Appendix IX inorganic constituents due to release of contaminants from SWMU 5.

Sediment Sample Results. Sediment samples were collected the week of January 20, 1992, in accordance with the RFI Workplan (U.S. Navy, 1991a,b) at three locations (MPT-2-SD-4, MPT-2-SD-5, and MPT-2-SD-6) along with the surface water samples. These sample locations were chosen to determine whether contaminants from the SWMU 5 were migrating off-site via the surface water conveyance system and accumulating in the sediments. Figure 4-51 presents the sediment sample locations and analytical results. Table 4-52 summarizes the detected chemicals in the SWMU 5 sediment samples.

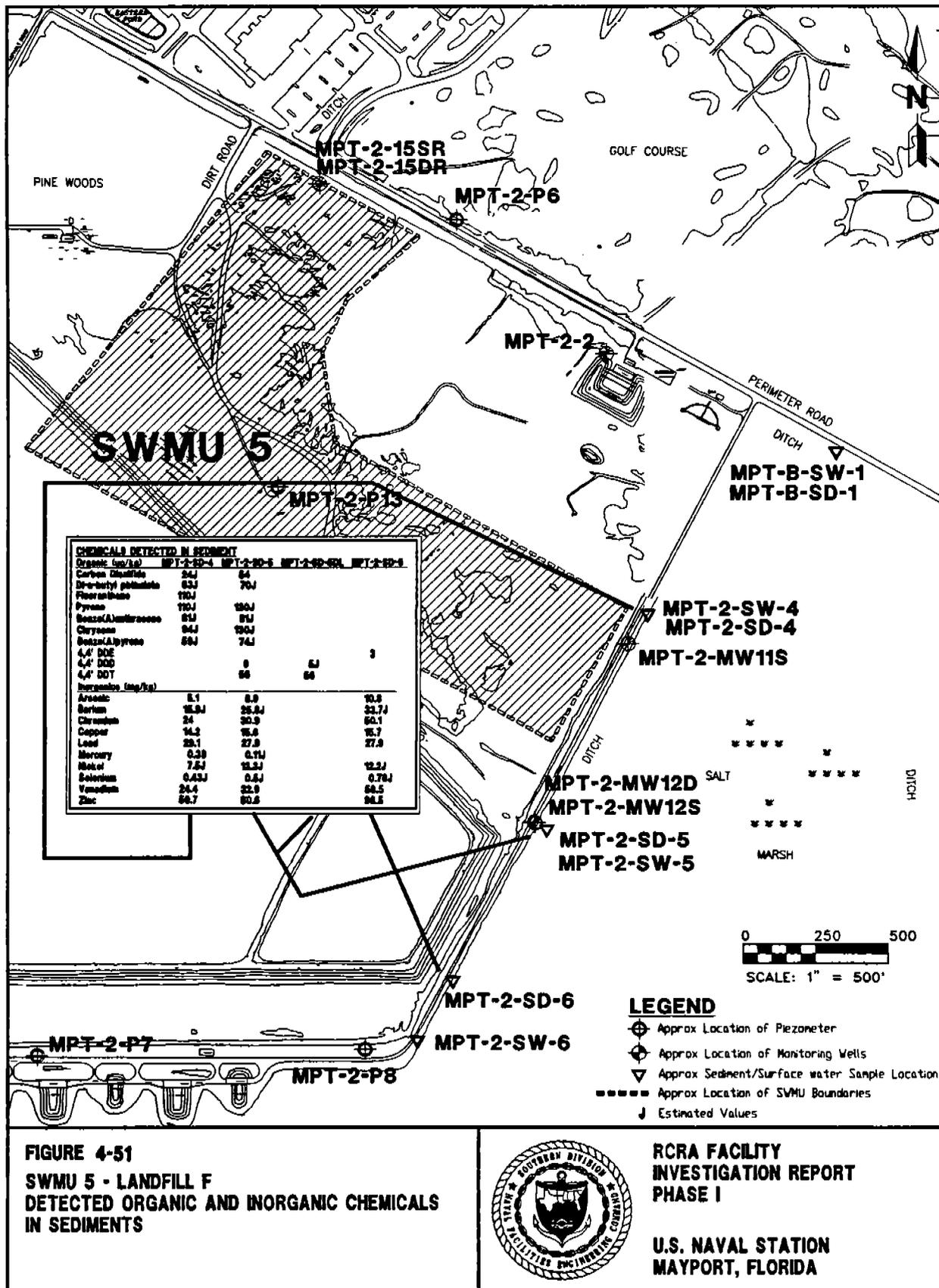


FIGURE 4-51
SWMU 5 - LANDFILL F
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN SEDIMENTS



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INVESTIGATION REPORT
PHASE I

U.S. NAVAL STATION
MAYPORT, FLORIDA

**Table 4-52
Detected Organic and Inorganic Chemicals in SWMU 5 Sediment Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20722		20722		20722		20722	
Sample Matrix:			Sediment		Sediment		Sediment		Sediment	
Location/Sample No.:			MPT-2-SD-4		MPT-2-SD-5		MPT-2-SD-5DL		MPT-2-SD-6	
Date Sampled:			01/22/92		01/22/92		01/22/92		01/22/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
75-15-0	Carbon disulfide	µg/kg	24	J	54					
84-74-2	Di-n-butyl phthalate	µg/kg	63	J	70	J				
206-44-0	Fluoranthene	µg/kg	110	J						
129-00-0	Pyrene	µg/kg	110	J	130	J				
56-55-3	Benzo(a)anthracene	µg/kg	61	J	81	J				
218-01-9	Chrysene	µg/kg	94	J	130	J				
50-32-8	Benzo(a)pyrene	µg/kg	59	J	74	J				
72-55-9	4,4'-DDE	µg/kg							3	
72-54-8	4,4'-DDD	µg/kg			6		5	J		
50-29-3	4,4'-DDT	µg/kg			56		56			
7440-38-2	Arsenic	mg/kg	5.1		8.9				10.8	
7440-39-3	Barium	mg/kg	15.9	J	25.8	J			33.7	J
7440-47-3	Chromium	mg/kg	24		30.9				50.1	
7440-50-8	Copper	mg/kg	14.2		15.6				15.7	
7440-92-1	Lead	mg/kg	29.1		27.9				27.9	
7440-97-6	Mercury	mg/kg	0.39		0.11	J				
7440-02-0	Nickel	mg/kg	7.5	J	13.3	J			12.2	J
7440-49-2	Selenium	mg/kg	0.43	J*	0.5	J			0.76	J
7440-62-2	Vanadium	mg/kg	24.4		32.9				56.5	
7440-66-6	Zinc	mg/kg	59.7		80.6				96.5	

Notes: Laboratory data validated with NEESA Level C criteria.
 "DL" in Location/Sample No. indicates a laboratory dilution.
 Conc. = concentration.
 Qual. = qualifier.
 µg/kg = micrograms per kilogram.
 "J" = estimated value.
 mg/kg = milligrams per kilograms.

Detected VOCs included carbon disulfide and di-n-butyl phthalate. Carbon disulfide, a common byproduct of anaerobic decomposition of organic material, was found in two of the samples ranging from an estimated 24 $\mu\text{g}/\text{kg}$ to 54 $\mu\text{g}/\text{kg}$. Various polynuclear aromatic hydrocarbons (PAH) were detected in the SWMU 5 sediment samples. Fluoranthene was detected in sample MPT-2-SD-4 at an estimated concentration of 110 $\mu\text{g}/\text{kg}$. Pyrene was estimated at concentrations of 110 and 130 $\mu\text{g}/\text{kg}$ in samples MPT-2-SD-4 and MPT-2-SD-5, respectively. Benzo[a]anthracene was estimated at concentrations of 61 and 81 $\mu\text{g}/\text{kg}$ in samples MPT-2-SD-4 and MPT-2-SD-5, respectively. Chrysene was estimated at concentrations of 94 and 130 $\mu\text{g}/\text{kg}$ in samples MPT-2-SD-4 and MPT-2-SD-5, respectively. Benzo[a]pyrene was estimated at concentrations of 59 and 74 $\mu\text{g}/\text{kg}$ in samples MPT-2-SD-4 and MPT-2-SD-5, respectively. A congener of DDT, 4,4'-DDE, was detected in sample MPT-2-SD-6 at 3 $\mu\text{g}/\text{kg}$. Another congener of DDT, 4,4'-DDD, was detected in sample MPT-2-SD-5 at 6 $\mu\text{g}/\text{kg}$. DDT was also detected in sample MPT-2-SD-5 at 56 $\mu\text{g}/\text{kg}$. Various metals were found in the sediment samples, but not at levels indicating a release of hazardous substances from SWMU 5. Mercury, however, was detected in two samples. Sample MPT-2-SD-4 reported mercury at 0.39 mg/kg. Sample MPT-2-SD-5 reported an estimated mercury concentration of 0.11 mg/kg.

Additional sampling is recommended upstream from two of the sediment sample locations. Samples MPT-2-SD-4 and MPT-2-SD-5 had detections of pesticides, PAH, and mercury. These sample locations were collected in the drainage ditch southeast of SWMU 5. These sample locations are near drainage confluences from SWMU 5, and it is recommended that additional samples be collected upstream towards SWMU 5 to confirm whether or not the detected contamination is due to releases from SWMU 5.

Soil Samples. Subsurface soil samples were collected from MPT-2-MW11S and MPT-2-MW12S during well construction. Table 4-53 and Figure 4-52 present the organic and inorganic chemicals detected in these subsurface soil samples. Xylene (total) was detected in both samples, MPT-2-11S and MPT-2-12S, at estimated concentrations of 2 $\mu\text{g}/\text{kg}$. No other VOCs, SVOCs, pesticides, or PCBs were detected in these samples. Various metals were detected, but not at concentrations that indicating a release of hazardous substances from SWMU 5.

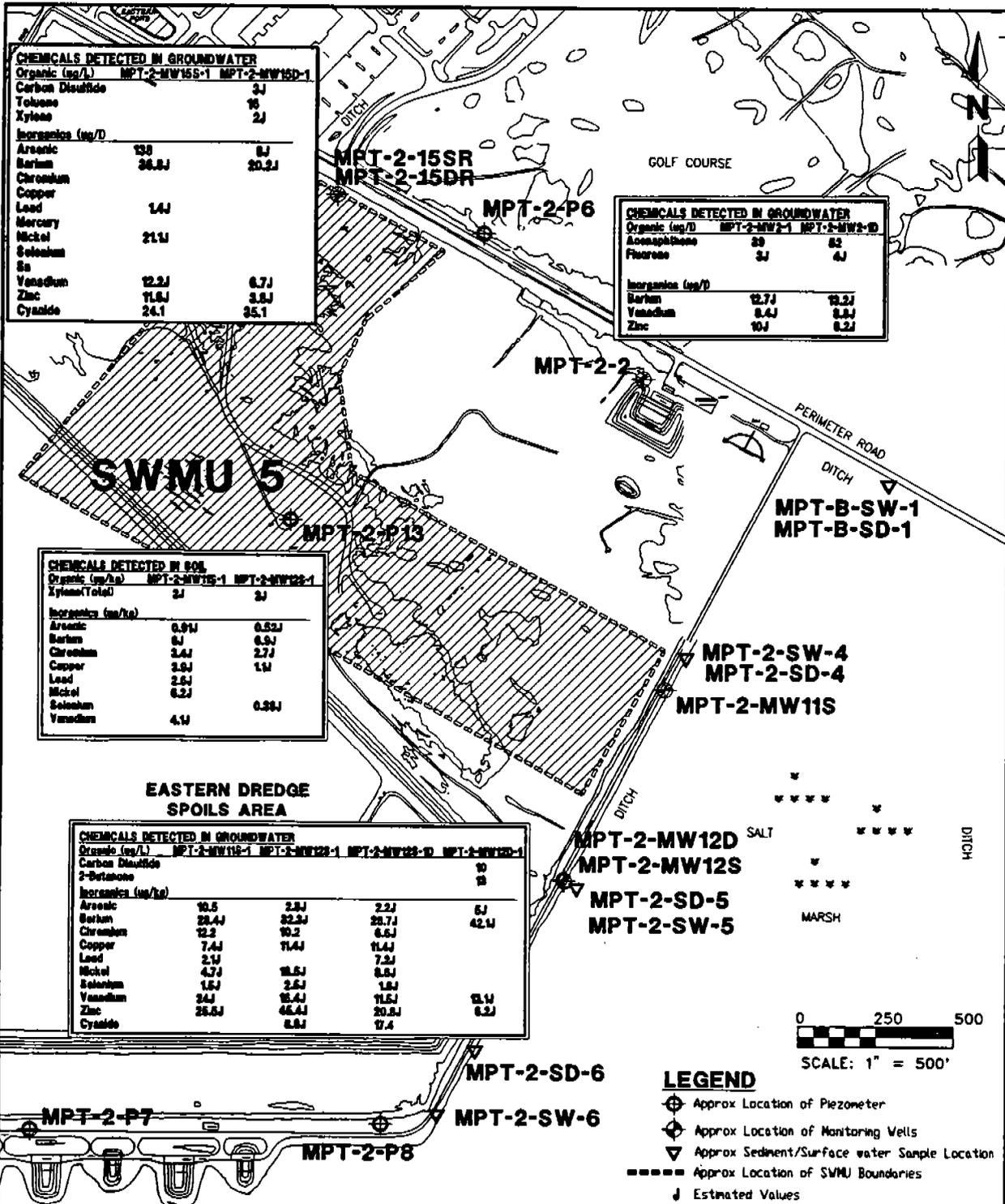
Groundwater Samples. Groundwater in the unconfined surficial aquifer at Mayport is classified Class G-II as defined by Chapter 17-3.403, FAC. Class G-II groundwater is potable-use groundwater in aquifers that have TDS contents of less than 10,000 mg/l, unless otherwise classified. G-II groundwater should meet primary and secondary drinking water quality standards as listed in Chapters 17-550.310 and 550.320, FAC. TDS, as measured by a gravimetric method (USEPA Method 160.1), ranged from 823 mg/l in sample MPT-2-MW2-1 to 33,400 mg/l in sample MPT-2-MW12D-1. TDS as measured by the gravimetric method is biased low for many of the analyses if compared to an ion balance. Table 4-54 presents the values measured at SWMU 5 for major groundwater quality parameters.

General water quality of the surficial aquifer at SWMU 5 is characterized by saline conditions as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely or limited at best. Although the surficial aquifer is classified G-II, secondary standards (Chapter 17.550.320, FAC) are exceeded in most of the surficial wells for TDS, chloride, and sulfate. Maximum contaminant levels as specified in Chapter 17.550.320 FAC for TDS and chloride are 500 and 250 mg/l,

**Table 4-53
Detected Organic and Inorganic Chemicals in SWMU 5 Soil Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20753		20753	
Sample Matrix:			Soil		Soil	
Location/Sample No.:			MPT-2-11S		MPT-2-12S	
Date Sampled:			01/24/92		01/24/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.
1330-20-7	Xylene (total)	µg/kg	2	J	2	J
7440-38-2	Arsenic	mg/kg	0.91	J	0.52	J
7440-39-3	Barium	mg/kg	6	J	6.9	J
7440-47-3	Chromium	mg/kg	3.4	J	2.7	J
7440-50-8	Copper	mg/kg	3.9	J	1.1	J
7440-92-1	Lead	mg/kg	2.6	J		
7440-02-0	Nickel	mg/kg	6.2	J		
7440-49-2	Selenium	mg/kg			0.38	J
7440-62-2	Vanadium	mg/kg	4.1	J		
<p>Notes: Laboratory data validated with NEESA Level C criteria. Conc. = concentration. Qual. = qualifier. µg/kg = micrograms per kilogram. "J" = estimated value. mg/kg = milligrams per kilogram.</p>						



CHEMICALS DETECTED IN GROUNDWATER

Organic (ug/L)	MPT-2-MW15S-1	MPT-2-MW15D-1
Carbon Dioxide	3J	
Toluene	16	
Xylenes	2J	
Inorganics (ug/D)		
Arsenic	138	8J
Barium	36.8J	20.2J
Chromium		
Copper		
Lead	1.4J	
Mercury		
Nickel	21.1J	
Selenium		
Sr		
Vanadium	12.2J	6.7J
Zinc	11.6J	3.8J
Cyanide	24.1	35.1

CHEMICALS DETECTED IN GROUNDWATER

Organic (ug/D)	MPT-2-MW2-1	MPT-2-MW2-1D
Organics		
Acenaphthene	29	6J
Fluorene	3J	4J
Inorganics (ug/D)		
Barium	12.7J	19.2J
Vanadium	8.4J	8.8J
Zinc	10J	8.2J

CHEMICALS DETECTED IN SOIL

Organic (ug/kg)	MPT-2-MW11S-1	MPT-2-MW12S-1
Xylenes (Total)		
	2J	2J
Inorganics (ug/kg)		
Arsenic	0.91J	0.52J
Barium	6J	6.9J
Chromium	3.4J	2.7J
Copper	3.8J	1.1J
Lead	2.6J	
Nickel	6.2J	
Selenium		0.38J
Vanadium	4.1J	

CHEMICALS DETECTED IN GROUNDWATER

Organic (ug/L)	MPT-2-MW11S-1	MPT-2-MW12S-1	MPT-2-MW12S-2	MPT-2-MW12S-1
Carbon Dioxide				10
2-Butanone				18
Inorganics (ug/kg)				
Arsenic	10.5	2.8J	2.2J	6J
Barium	28.4J	32.5J	25.7J	42.1J
Chromium	12.2	10.2	6.6J	
Copper	7.4J	11.4J	11.4J	
Lead	2.1J		7.2J	
Nickel	4.7J	18.6J	6.6J	
Selenium	1.5J	2.6J	3.8J	
Vanadium	3.4J	16.4J	11.5J	8.1J
Zinc	26.6J	46.4J	20.8J	8.2J
Cyanide		8.8J	17.4	

- LEGEND**
- ⊕ Approx Location of Piezometer
 - ⊙ Approx Location of Monitoring Wells
 - ▽ Approx Sediment/Surface water Sample Location
 - Approx Location of SWMU Boundaries
 - ↓ Estimated Values

FIGURE 4-52
SWMU 5 - LANDFILL F
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN GROUNDWATER AND SOIL



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respectively. Approximate median values in the unconfined surficial aquifer in SWMU 5 for these parameters are 13,000 and 5,000 mg/l, respectively. Reducing conditions were also evident from the presence of sulfide in the surficial aquifer. Anaerobic conditions and the presence of sulfide in the surficial aquifer would reduce the mobility of metal contaminants if present.

Table 4-54
General Water Quality for SWMU 5 Groundwater Samples

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

USEPA Method	Analyte	Unit	MPT-2-MW2-1	MPT-2-MW11S-1	MPT-2-MW12S-1	MPT-2-MW12D-1	MPT-2-MW15S-1	MPT-2-MW15D-1
160.1	Total Dissolved Solids	mg/l	823	11,600	13,000	33,400	3,350	24,100
325.1	Chloride	mg/l	238	11,200	11,900	3,080	1,010	25,400
376.1	Sulfide	mg/l	0.6	4.5	4.4	2.5	0.2	5.3
375.4	Sulfate	mg/l	9.1	360	463	1,760	439	1,580

Note: mg/l = milligrams per liter.

Table 4-55 and Table 4-56 summarize the results for potential chemicals-of-concern detected above quantitation limits in the SWMU 5 groundwater samples. Figure 4-52 also presents sample locations and laboratory results. Low concentrations of the VOCs carbon disulfide, 2-butanone, toluene, and xylene were detected in some of the groundwater samples. Acenaphthene and fluorene were detected in one sample and its duplicate. No pesticides or PCBs were detected in any groundwater samples. Inorganic elements and compounds (arsenic, barium, chromium, copper, lead, nickel, selenium, vanadium, zinc, and cyanide) were detected at low concentrations in groundwater samples. Samples for metals were collected without filtration and were preserved immediately after collection with acid. The metal results are, therefore, total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions.

Carbon disulfide was detected in sample MPT-2-MW12D-1 at 10 µg/l and in sample MPT-2-MW15D-1 at an estimated concentration of 3 µg/l. The VOC, 2-butanone, was also detected in sample MPT-2-MW12D-1 at 13 µg/l. Xylene (total) and toluene were detected in sample MPT-2-MW15D-1 at 2 (estimated) and 16 µg/l, respectively. No other samples reported VOCs.

Groundwater sample MPT-2-MW2-1 and its duplicate reported acenaphthene at 39 and 52 µg/l, respectively. Fluorene was reported in sample MPT-2-MW2-1 and its duplicate at estimated concentrations of 3 and 4 µg/l, respectively. No pesticides or PCBs were reported in any groundwater samples from SWMU 5.

The following metals were detected in samples collected from SWMU 5.

- Arsenic ranged from a concentration of 2.8 µg/l (estimated) in sample MPT-2-MW12S-1 to 138 µg/l in sample MPT-2-MW15S-1.

Table 4-56
Detected Inorganic Chemicals in SWMU 5 Groundwater Samples

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Delivery Group: Sample Matrix:	20884		20884		20837		20837		20837		20902		20877		20877	
	Water		Water		Water		Water		Water		Water		Water		Water	
	MPT-2-MW2-1	MPT-2-MW2-1D	MPT-2-MW11-1	MPT-2-MW12S-1	MPT-2-MW12S-1D	MPT-2-MW12D-1	MPT-2-MW15S-1	MPT-2-MW15D-1	MPT-2-MW2-1	MPT-2-MW2-1D	MPT-2-MW11-1	MPT-2-MW12S-1	MPT-2-MW12S-1D	MPT-2-MW12D-1	MPT-2-MW15S-1	MPT-2-MW15D-1
Date Sampled:	02/11/92	02/11/92	02/05/92	02/05/92	02/05/92	02/05/92	02/05/92	02/05/92	02/05/92	02/05/92	02/05/92	02/05/92	02/12/92	02/10/92	02/10/92	02/10/92
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
7440-38-2	Arsenite	µg/l	12.7	J	10.5	J	2.8	J	2.2	J	5	J	138	J	6	J
7440-39-3	Barium	µg/l			28.4	J	32.3	J	28.7	J	42.1	J	36.8	J	20.2	J
7440-47-3	Chromium	µg/l			12.2	J	10.2	J	6.6	J		J		J		J
7440-50-8	Copper	µg/l			7.4	J	11.4	J	11.4	J		J		J		J
7440-92-1	Lead	µg/l			2.1	J	7.2	J	7.2	J		J		J		J
7440-02-0	Nickel	µg/l			4.7	J	18.5	J	8.6	J		J		J		J
7440-49-2	Selenium	µg/l			1.5	J	2.5	J	1.6	J		J		J		J
7440-62-2	Vanadium	µg/l	8.4	J	24	J	16.4	J	11.5	J	13.1	J	12.2	J	6.7	J
7440-66-6	Zinc	µg/l	10	J	25.5	J	45.4	J	20.8	J	6.2	J	11.6	J	3.8	J
5956-70-0	Cyanide	µg/l			8.6	J	8.6	J	17.4	J		J	24.1	J	35.1	J

Laboratory data validated with NEESA Level C criteria.

Notes: Conc. = concentration.
 Qual. = Qualifier.
 µg/l = micrograms per liter.
 "J" = estimated value.

- Estimated barium concentrations ranged from 12.7 $\mu\text{g}/\ell$ in sample MPT-2-MW2-1 to 42.1 $\mu\text{g}/\ell$ in sample MPT-2-MW12D-1.
- Chromium concentrations ranged from 6.6 $\mu\text{g}/\ell$ (estimated) in sample MPT-2-MW12S-1D (duplicate sample of MPT-2-MW12S-1) to 12.2 $\mu\text{g}/\ell$ in sample MPT-2-MW11-1.
- Copper concentrations were estimated at 7.4 $\mu\text{g}/\ell$ in sample MPT-2-MW11-1 to 11.4 $\mu\text{g}/\ell$ in sample MPT-2-MW12S-1 and its duplicate.
- Estimated lead concentrations ranged from 1.4 $\mu\text{g}/\ell$ in sample MPT-2-MW15S-1 to 7.2 $\mu\text{g}/\ell$ in sample MPT-2-MW12S-1D. Lead was not detected in sample MPT-2-MW12S-1.
- Estimated nickel concentrations ranged from 4.7 $\mu\text{g}/\ell$ in sample MPT-2-MW11-1 to 21.2 $\mu\text{g}/\ell$ in sample MPT-2-MW15S-1.
- Estimated selenium concentrations were estimated from 1.5 $\mu\text{g}/\ell$ in sample MPT-2-MW11-1 to 2.5 $\mu\text{g}/\ell$ in sample MPT-2-MW12S-1.
- Estimated vanadium concentrations were estimated from 6.7 $\mu\text{g}/\ell$ in sample MPT-2-MW15D-1 to 24 $\mu\text{g}/\ell$ in sample MPT-2-MW11-1.
- Estimated zinc concentrations ranged from 3.8 $\mu\text{g}/\ell$ in sample MPT-2-MW15D-1 to 45.4 $\mu\text{g}/\ell$ in sample MPT-2-MW12S-1.
- Cyanide concentrations ranged from an estimate of 8.6 $\mu\text{g}/\ell$ in sample MPT-2-MW12S-1 to 35.1 $\mu\text{g}/\ell$ in sample MPT-2-MW15D-1.

The data do not indicate groundwater contamination at SWMU 5. The frequency and magnitude of VOC, SVOC, and metal detections do not indicate a systematic pattern of release of Appendix IX inorganic constituents into groundwater at SWMU 5.

4.9 SWMU 13, OLD FIRE FIGHTING TRAINING AREA.

4.9.1 SWMU 13 Description SWMU 13, Old Fire Fighting Training Area, consists of three areas identified from aerial photographs and discussions with site personnel. The areas were located at the south end of an abandoned runway now occupied by buildings, parking areas, and grassy medians (Figure 4-53). This site was used as a fire fighting training area from 1973 to 1982. The areas consisted of low, earthen berms constructed on an abandoned asphalt runway. During use of the area, fuel was floated on top of water placed within the pits (approximately two-thirds part water to one-third part fuel) and then ignited. Residual fuels and water either evaporated or infiltrated at the sites. No collection sump or treatment system was used. It is estimated that 300 to 400 gallons of fuel was burned per month. The composition was approximately 90 to 95 percent waste fuel (AVGAS, JP-4, or JP-5) and 5 to 10 percent waste oils with minor percentages of solvents, paint thinner, trichloroethene, toluene, transformer oil (unknown if it contained PCB), and hydraulic fluid (unknown if it contained PCB). Fuels and other items not consumed during training exercises remained in the pit or ran off the sides of the runway. During construction of a new pipeline, the soil of the southernmost area was disturbed to a depth of 4 to 6 feet. The soils may have been spread over the immediate area of the fire

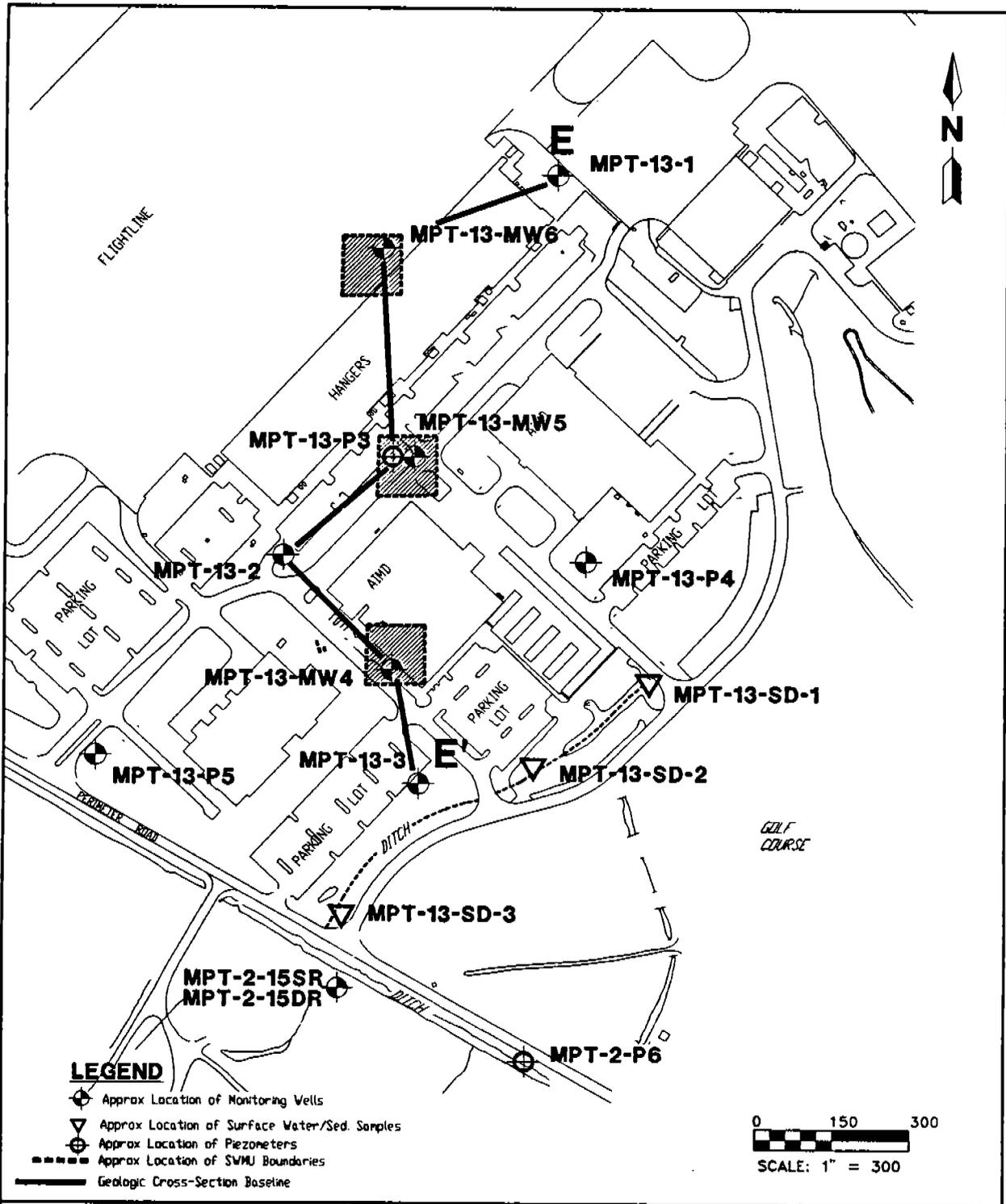


FIGURE 4-53
SWMU 13 - OLD FIRE FIGHTING TRAINING AREA
SITE PLAN



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fighting training area. The area was paved with asphalt as part of a parking lot (ESE, 1986).

4.9.2 Summary of Previous Findings Three monitoring wells (MPT-13-1, MPT-13-2, and MPT-13-3) were installed in the vicinity of SWMU 13 during the ESI in 1987. Figure 4-54 presents the sample locations and detected chemicals. Soil and groundwater samples were collected from each boring and analyzed for priority pollutant VOCs, SVOCs, pesticides and PCBs, and metals. The only contaminants observed in these samples were lead at a concentration of 2 $\mu\text{g}/\text{l}$ in the groundwater sample from monitoring well MPT-13-3, and mercury at a concentration of 5.3 $\mu\text{g}/\text{l}$ in a groundwater sample obtained from monitoring well MPT-13-1.

4.9.3 Summary of Exploration and Sampling Program The exploration program at SWMU 13 included the following data-gathering activities:

- installing three new monitoring wells and five piezometers in the surficial aquifer,
- sampling and analyzing subsurface soil during borehole construction for monitoring wells,
- sampling and analyzing groundwater at new and existing monitoring wells, and
- sampling and analyzing sediment samples from inverts of the storm drain conveyance system.

The locations of these exploration and sampling activities at SWMU 13 are presented in Figure 4-53. Five piezometers were also installed to supplement local and regional data on groundwater flow rate and direction.

The data-gathering activities were composed of the field activities listed below. Table 4-57 summarizes the type, frequency, and media of samples collected at SWMU 13 during the Phase 1 RFI. Field activities followed the standard operating procedures in project-specific Technical Memoranda located in Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b).

Drilling and Subsurface Soil Sampling. Borehole locations are shown in Figure 4-53. Drilling and subsurface soil sampling were accomplished as described in the Technical Memorandum, Drilling and Subsurface Soil Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b). Soil samples were analyzed by the SW-846 methods specified in the Workplan. Selected physical parameters were also measured and included: bulk density (ASTM D2937-83), cation exchange capacity (USEPA Method 9081), organic content (USEPA Method 9060), soil pH (USEPA Method 9045), particle size distribution (ASTM D422-63), and moisture content ASTM D2216-80).

Well Construction and Development. Well and piezometer locations are presented in Figure 4-53. Three new surficial aquifer monitoring wells and five new piezometers were installed during Phase 1 field activities at SWMU 13. Table 4-58 summarizes the inventory and construction specifications of the monitoring wells and piezometers installed at SWMU 13. Well construction and development were accomplished as described in the Technical Memorandum, Well Construction and

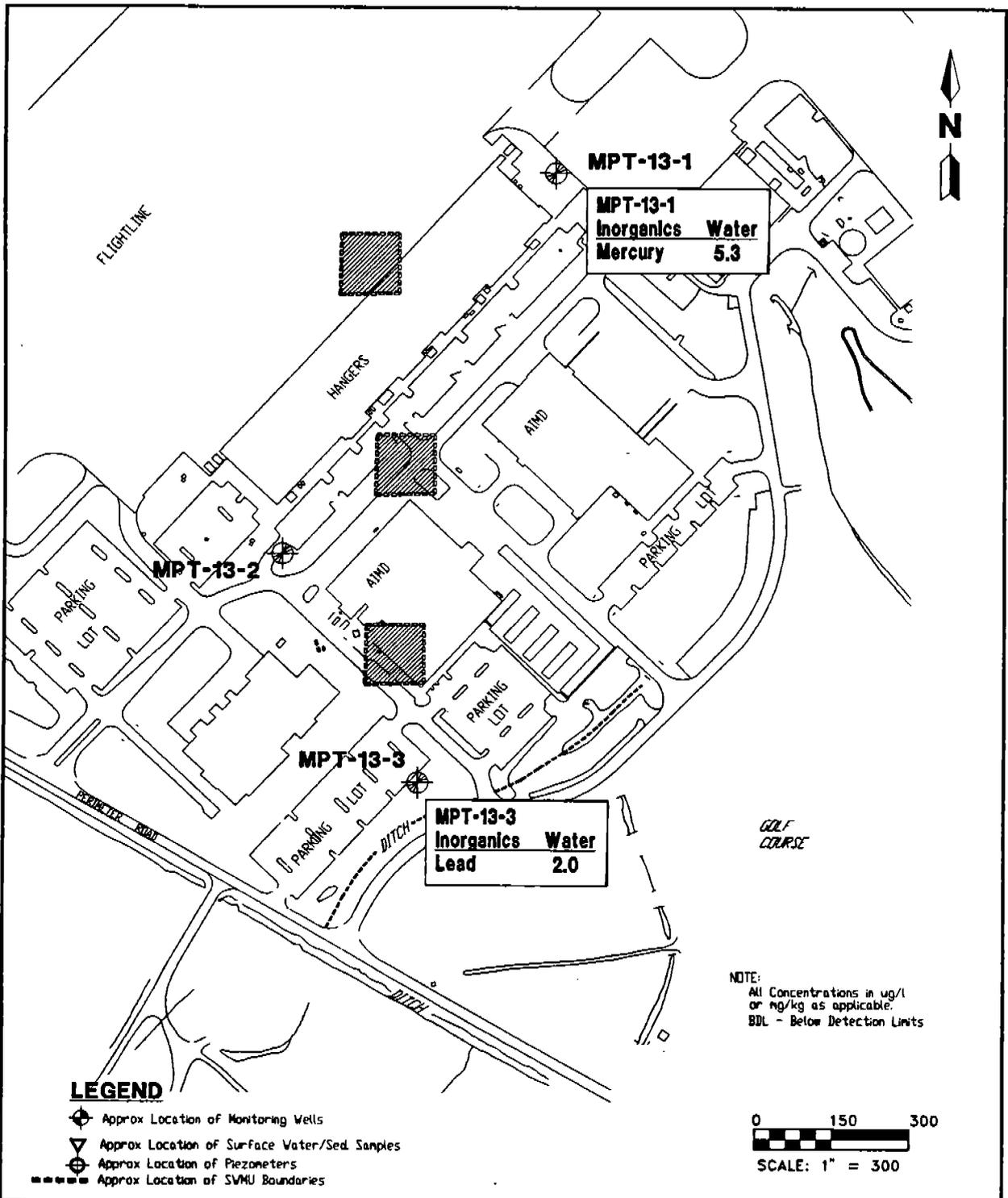


FIGURE 4-54
SWMU 13 - OLD FIRE FIGHTING TRAINING AREA
EXPANDED SITE INVESTIGATION (ESI)
FINDINGS



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**Table 4-57
Summary of SWMU 13 Chemical Analyses**

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NAVSTA Mayport
Mayport, Florida

Sample Source	Media	U.S. Environmental Protection Agency SW-846 ¹						Totals
		Method 8240 VOC	Method 8270 SVOC	Method 6010, 7470, 7480 Metals	Method 8080 Pest/PCB	General Parameters (soil)	General Water Quality	
SWMU 5	Soil ²	4	4	4	4	3	0	19
	Sediment ²	4	4	4	4	0	0	16
	Groundwater ²	6	6	6	6	0	6	30

¹ Selected Appendix IX Groundwater Monitoring List Compounds as analyzed by method indicated.

² Includes field duplicate samples.

Notes: VOC = volatile organic compounds.
SVOC = semivolatile organic compounds.
Pest/PCB = organochlorine pesticides and polychlorinated biphenyls.
SWMU = solid waste management unit.

**Table 4-58
Summary of SWMU 13 Piezometer and Monitoring Well Installations**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU Number	Piezometer and Monitoring Well No.	Phase	Diameter (inches)	Total Depth (feet)	Screened Interval (feet bls)
13	MPT-13-1	ESI	2	10	3 - 10
	MPT-13-2	ESI	2	10	3 - 10
	MPT-13-3	ESI	2	10	3 - 10
	MPT-13-MW4	Phase 1 RFI	2	12	2 - 12
	MPT-13-MW5	Phase 1 RFI	2	13	3 - 13
	MPT-13-MW6	Phase 1 RFI	2	12	2 - 12
	MPT-13-P1	Phase 1 RFI	2	10	5 - 10
	MPT-13-P3	Phase 1 RFI	2	10	5 - 10
	MPT-13-P4	Phase 1 RFI	2	10	5 - 10
	MPT-13-P5	Phase 1 RFI	2	10	5 - 10
	MPT-13-P6	Phase 1 RFI	2	10	5 - 10

Notes: SWMU = solid waste management unit.
bls = below land surface.
ESI = Expanded Site Investigation; E.C. Jordan; conducted September 1987 to October 1987.
Phase 1 RFI = Phase 1 RCRA Facility Investigation; ABB Environmental Services; conducted January 1992 to March 1992.

Development, Appendix B, of the RFI Workplan, Volume II (U.S. Navy, 1991b). Well installation and construction details for each well are presented in Appendix A, Volume II of this report.

Groundwater Sampling. Groundwater sampling was accomplished as described in the Technical Memorandum, Groundwater Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b). A total of six groundwater samples were collected, one from each of the existing and new monitoring wells. Samples were analyzed by USEPA SW-846 methods as specified in the RFI Workplan. Selected general water quality parameters were also measured in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983).

Sediment Sampling. Three sediment samples were collected from the drainage system at SWMU 13. Sediment sampling locations are shown in Figure 4-53. Sediment sampling was accomplished as described in the Technical Memorandum, Sediment and Surface Water Sampling, Appendix B in the RFI Workplan, Volume II (U.S. Navy, 1991b). Sediment samples will be taken immediately upstream from SWMU 13, immediately downstream near the site boundary, and immediately upstream of the junction with the stormwater drainage ditch along the Perimeter Road.

4.9.4 Environmental Setting Soil, sediment, and groundwater are the media of concern at SWMU 13 based on past waste management practices, site closure methods, and SWMU-specific analytical measurements. This section summarizes the geological and hydrogeological factors affecting contaminant fate and migration in these media at SWMU 13.

4.9.4.1 Geology This section describes the geological setting observed at SWMU 13 during the Phase 1 RFI. The Upper Hawthorn Group structure at the site is deduced from the deep borings made at SWMU 3 and south of SWMU 4. Physical characteristics of soils measured at SWMU 13 that affect contaminant migration are also presented in this section.

Geological Setting. Figure 4-55 shows a cross section summarizing the SWMU 13 geology. The cross section was composed from boring log data from new and existing monitoring wells and piezometers installed at SWMU 13. The cross section illustrates features typical of the Group I SWMUs. The uppermost unit consists of a surficial deposit of material dredged from the Mayport turning basin and the St. Johns River. Typically, beneath the surficial dredge material, a uniform, poorly graded, well sorted, sand (SP) with lenses of a very soft grey to dark-grey silty clay (CH, CM) are found. This sand unit, termed in the cross section undifferentiated post-Hawthorn deposits, grades at depth into the third unit, the Coosawhatchie Formation of the Upper Hawthorn Group (Scott, 1988).

Physical Characteristics of Soil. Grain-size distribution analyses show that all samples consisted mainly of poorly graded fine-grained sand size material (Table 4-59). Sample MPT-13-5 consists of 85 to 90 percent fine-grained sand. Sample MPT-13-6 is primarily (95 percent) medium-grained sand with less than 5 percent smaller than fine-grained sand size. MPT-13-4 and its duplicate consist of 80 percent fine-grained sand and 20 percent medium sand.

Based on the observed particle size distributions, an estimated effective porosity range of 0.25 to 0.35 appears reasonable (0.35 is used for the

estimation of average groundwater velocities) for the sands of the surficial aquifer at SWMU 13. The organic content (less than 1 percent) and ion exchange capacity (less than 2 milliequivalents per 100 grams) of the soils are relatively low as summarized in Table 4-60. This implies that retardation of contaminants in groundwater flow will be small and, therefore, soluble contaminants will travel at the same velocity as the groundwater.

Table 4-59
SWMU 13 Soil Uniformity Coefficient

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample	Percent Sand			Uniformity Coefficient Cu ¹
	F	M	C	
MPT-13-4	80	20		1.6
MPT-13-4 Duplicate	80	20		1.9
MPT-13-5	85	15		2.2
MPT-13-6	95			1.6

¹ Cu = D₆₀/D₁₀
Cu < 4 = well sorted, poorly graded.
Cu > 6 = poorly sorted, well graded.

Notes: F = fine.
M = medium.
C = coarse.

Table 4-60
SWMU 13 Physical Soil Characteristics

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Matrix:	Soil	Soil	Soil
Location/Sample No.:	MPT-13-MW4-1	MPT-13-MW5-1	MPT-13-MW6-1
Analyte			
Percent moisture	15	15.4	14.9
Soil bulk density	1.41	1.39	1.28
Cation exchange capacity	1.8	1.1	0.7
pH	8.19	8.6	9.11
TOC	2,470	1,320	1,870

Notes: Soil bulk density = grams per cubic centimeter.
Cation exchange capacity = milliequivalents per 100 grams.
pH = standard units.
TOC = total organic carbon in milligrams per liter.

4.9.4.2 **Hydrogeology** The hydrogeologic investigations conducted at SWMU 13 during the Phase I RFI collected data to characterize the potentiometric surface of the water table aquifer, estimate the hydraulic conductivities, and compute the average velocity of the groundwater flow in the uppermost aquifer at the site. These parameters were estimated based on groundwater elevation measurements, *in-situ* permeability testing (i.e., slug-tests), and soil characteristics of the aquifer formation. Darcy's Law was used to estimate average groundwater flow velocities.

Slug Test Both rising- and falling-head slug tests were conducted at SWMU 13 piezometers depending on the screened intervals of the piezometers and their location relative to the water table. Four to six trials were conducted at each location in order to provide an average of the estimated hydraulic conductivities (K) of the aquifer in the vicinity of the screened intervals. From the multiple trials, the precision of the K data was also evaluated.

Piezometer MPT-13-P-1 and MPT-13-P-4 had median *in-situ* conductivities of approximately 18.1 and 15.1 feet per day. These piezometers were completed in fine-grained sands with shell fragments. MPT-13-P-5 had a median *in-situ* conductivity of approximately 1.3 feet per day. The lower conductivity measured at MPT-13-P-5 may be due to its proximity to the wetlands to the south and the silty sands and fine-grained sands observed during its construction (Volume II, Appendix A, Boring Logs).

Groundwater Gradient and Flow Velocity. Water table elevations were measured on February 16, March 25, and April 20, 1992, for selected piezometers and monitoring wells throughout NAVSTA Mayport. Groundwater measurements were obtained specifically from five piezometers and six monitoring wells at SWMU 13. The measurements were generally achieved within a 4-hour period during each measurement event. Table 4-61 presents the water table measurements at SWMU 13 for these three dates.

Facility-wide water table surface maps were developed for each monthly survey event. Because no significant monthly variation was observed on a facility basis, an average water table surface map was developed using all three groundwater measurement events. The estimated water table surface map for SWMU 13 using these data is presented in Figure 5-56.

Selected NAVSTA Mayport groundwater wells and piezometer were monitored over a 48-hour period in February 1992 to observe possible influences from tidal effects. Wells located away from tidally influenced water bodies (greater than 100 feet) were minimally affected by tidal fluctuations. Groundwater response in these wells was weak to non-existent. Tidal influence on the water table aquifer at SWMU 13 is expected to be minimal based on these observations.

Average groundwater velocities were calculated based on Darcy's Law using estimates of porosity, permeability, and aquifer gradients obtained from the field and laboratory observations. Table 4-62 summarizes the parameters and estimated velocities. Groundwater flows perpendicularly from the runways towards the southeast. Gradients are higher near the runways and decrease at SWMU 13 and the flightline facilities. Average velocities near the runway are approximately 0.25 foot per day near MPT-13-P1, and decrease to 0.07 foot per day near MPT-13-P-4. The groundwater gradient increases again towards the south along the ditch

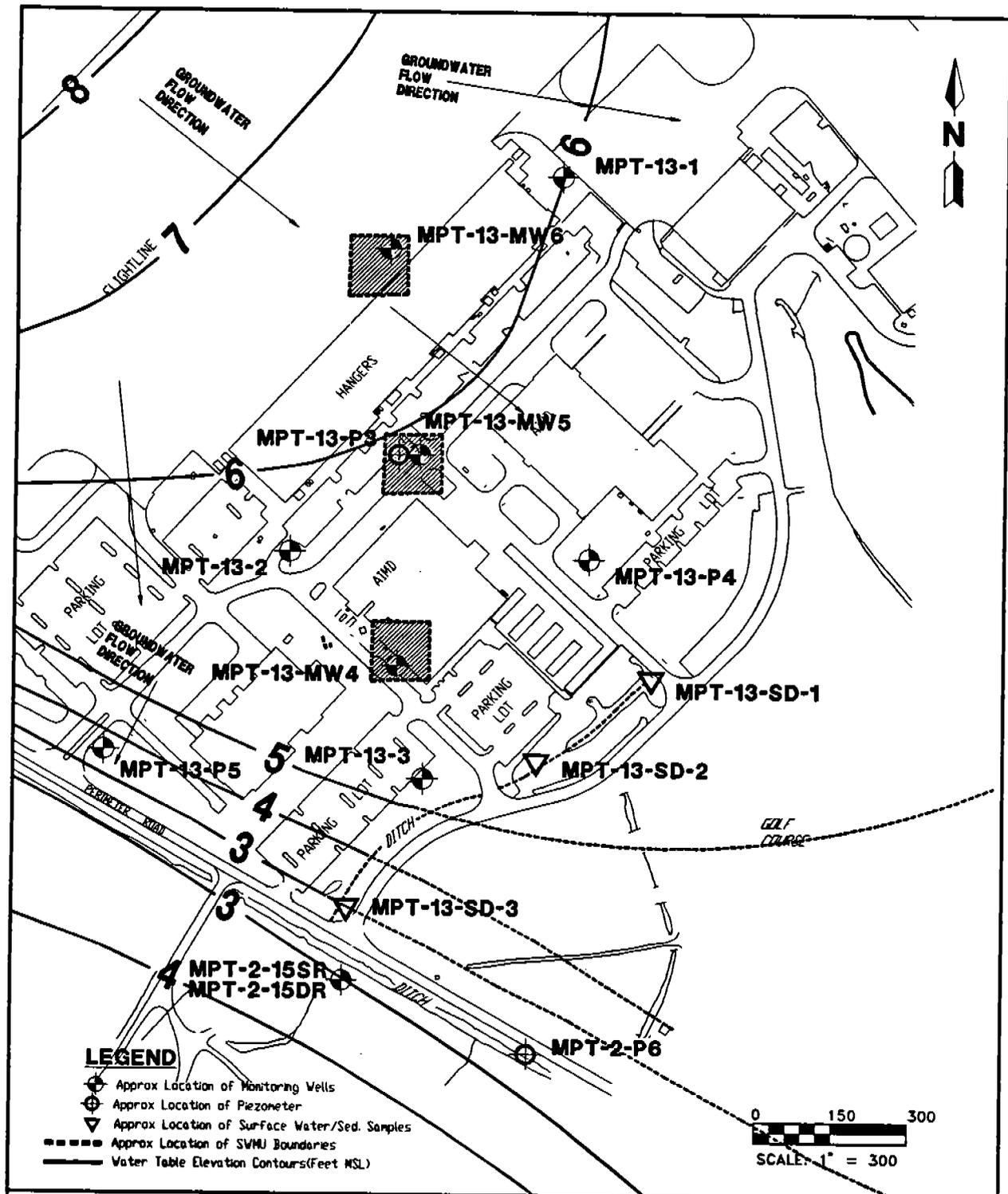


FIGURE 4-56
SWMU 13 - OLD FIRE FIGHTING TRAINING AREA
WATER TABLE SURFACE MAP



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Table 4-61
Summary of SWMU 13 Water Level Data

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Well/Piezometer	X Easting State Plane ¹	Y Northing State Plane ¹	Z Elev. (MSL)	Water Level 02/16/92			Water Level 03/25/92			Water Level 04/20/92			Avg. Elev. ² (MSL)	Depth Standard Deviation ³
				Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)		
MPT-13-1	369004.036	2202051.504	13.06	NM	NM	NM	04:25 pm	7.4	5.66	03:51 pm	2.8	10.26	5.61	0.05
MPT-13-MW-6	367684.002	2201904.440	9.68	NM	NM	NM	04:35 pm	2.8	6.86	03:17 pm	2.83	6.83	6.85	0.01
MPT-13-P5	367115.325	2200912.227	6.45	NM	NM	NM	02:17 pm	2.46	3.99	06:30 pm	2.78	3.67	3.83	0.16
MPT-13-P6	366879.480	2202120.087	10.16	NM	NM	NM	04:40 pm	1.82	8.34	03:45 pm	2.83	7.33	7.84	0.51
MPT-13-MW-4	367688.017	2201085.379	9.88	02:04 pm	4.73	5.15	01:29 pm	5.09	4.79	03:55 pm	5.18	4.70	4.88	0.19
MPT-13-3	367740.557	2200862.186	10.41	02:08 pm	5.62	4.79	01:24 pm	5.74	4.67	04:00 pm	5.95	4.46	4.64	0.14
MPT-13-2	367476.397	2201306.774	12.79	02:11 pm	6.97	5.82	01:28 pm	7.23	5.56	03:40 pm	7.26	5.53	5.63	0.13
MPT-13-MW-5	367718.672	2201499.204	10.04	02:14 pm	3.74	6.30	01:45 pm	3.99	6.05	03:37 pm	4.03	6.01	6.12	0.13
MPT-13-P3	367715.816	2201497.109	10.18	02:16 pm	3.90	6.28	01:44 pm	4.15	6.03	12:00 am	NM	NM	6.16	0.13
MPT-13-P4	369068.628	2201301.348	9.31	02:20 pm	3.62	5.69	01:51 pm	3.78	5.53	03:50 pm	3.92	5.39	5.54	0.12
MPT-13-P1	366075.640	2201715.978	11.04	NM	NM	NM	NM	NM	NM	3:51 pm	2.8	8.24	8.24	0.00

¹Florida State Plane Coordinate System.

²Arithmetic average of all water level measurements for each well.

³Standard deviation of all water level measurements for each well.

Notes: Elev. = elevation.

MSL = mean sea level.

LCL = local.

TOC = top of casing as datum.

NM = not measured.

that parallels the perimeter road near MPT-13-P-5. The average velocity, however, does not appear to change significantly because the coefficient of permeability is lower in this area.

Table 4-62
Estimation of Average Groundwater Velocities at SWMU 13
Based on Darcy's Law

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Location	Estimated Effective Porosity (percent)	Hydraulic Conductivity (feet/day)	Estimated Gradient (feet/feet)	Calculated Average Velocity (feet/day)	Estimated Average Velocity (feet/day)
MPT-13-P-1	0.35	18.1	0.0048	0.2482	0.25
MPT-13-P-4	0.35	15.1	0.0017	0.0733	0.07
MPT-13-P-5	0.35	1.3	0.0167	0.0620	0.06

4.9.5 Release Characteristics This section describes the extent of contamination observed at SWMU 13 during the Phase 1 investigation. Investigations described in this section of the report include: sediment investigation, subsurface soil investigation, and groundwater investigation.

The samples of environmental media (sediments, soil, and groundwater) were analyzed for organic and inorganic constituents by USEPA SW-846 Methods 8240 (VOCs), 8270 (SVOCs), 8080 (organochlorine pesticides and PCBs), 6010 (metals by ICP), 7420 (metals by GFAA), 7470 (metals by CVAA), and 9010 (cyanide).

The laboratory data for the selected Appendix IX analyses were validated in accordance with NEESA Level C requirements (NEESA, 1988) to determine data of known quality for site characterization and risk assessment. The data were either accepted without qualification, accepted as estimated values, or rejected. Chapter 3.0 discusses the data validation findings, and data validation narratives are presented in Volume III, Appendix E.

Groundwater samples were also analyzed in the laboratory for the following general water quality parameters: TDS, chloride, alkalinity (as CaCO₃), hardness (as CaCO₃), sulfate, sulfide, TKN, ammonia (total), nitrite and nitrate, total phosphorous, TOC, oil and grease, color, and pH. Analyses were conducted in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983). These are non-CLP methodologies, and general water quality samples were collected and analyzed in accordance with NEESA Level E guidelines (NEESA, 1988).

Sediment Sample Results. Figure 4-57 presents the sediment sample locations and analytical results. Table 4-63 summarizes the detected chemicals in the SWMU 13 sediment samples. Sediment samples were collected at the three sample locations (MPT-13-SD-1, MPT-13-SD-2, and MPT-13-SD-3). No surface water samples were collected because the surface water conveyance system was dry at the time of sampling.

**Table 4-63
Detected Organic and Inorganic Chemicals in SWMU 13 Sediment Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20740		20740		20740		20740	
Sample Matrix:			Sediment		Sediment		Sediment		Sediment	
Location/Sample No.:			MPT-13-SD-1		MPT-13-SD-2		MPT-13-SD-3		MPT-13-SD-3DL	
Date Sampled:			01/23/92		01/23/92		01/23/92		01/23/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
206-44-0	Fluoranthene	µg/kg	53	J						
129-00-0	Pyrene	µg/kg	51	J						
218-01-9	Chrysene	µg/kg	59	J						
72-55-9	4,4'-DDE	µg/kg	1.2				2.4		2.4	J
72-54-8	4,4'-DDD	µg/kg					2.8		4.1	J
57-74-09	Chlordane	µg/kg	9.4							
7440-38-2	Arsenic	mg/kg	0.42	J	0.33	J	0.69	J		
7440-39-3	Barium	mg/kg	4.1	J	1.8	J	5.2	J		
7440-47-3	Chromium	mg/kg	3.3	J	1.7	J	3.7	J		
7440-50-8	Copper	mg/kg	4.1	J	0.43	J	5.4	J		
7440-92-1	Lead	mg/kg	5.3	J			7.5	J		
7440-62-2	Vanadium	mg/kg	3.1	J	1	J	3.7	J		
7440-66-6	Zinc	mg/kg	37.6	J	4.6	J	17.2	J		

Notes: Laboratory data validated with NEESA Level C criteria.
 "DL" in Location/Sample No. indicates a laboratory dilution.
 Conc. = concentration.
 Qual. = qualifier.
 µg/kg = micrograms per kilogram.
 "J" = estimated value.
 mg/kg = milligrams per kilograms.

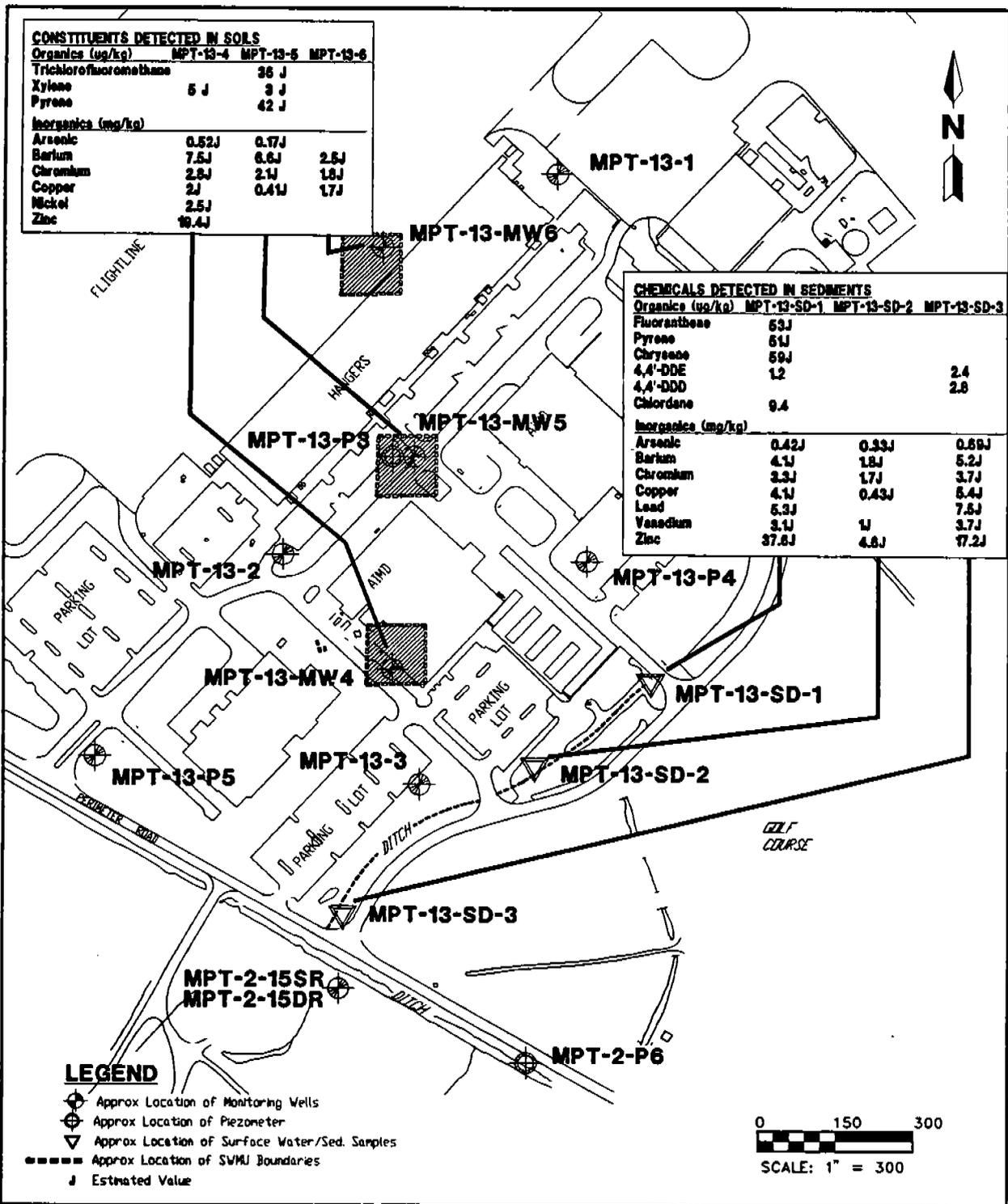


FIGURE 4-57
SWMU 13 - OLD FIRE FIGHTING TRAINING AREA
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN SOILS AND SEDIMENTS



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No VOCs were detected in any of the SWMU 13 sediment samples. A few of PAHs were detected in sediment sample MPT-13-SD-1 and congeners of DDT were detected in sediment samples MPT-13-SD-1 and MPT-13-SD-3. No PCBs were detected in any of the sediment samples. Metals were detected in sediment samples at frequencies and concentrations that do not indicate a release of hazardous substances.

Fluoranthene was reported in one sediment sample (MPT-13-SD-1) at an estimated concentration of 53 $\mu\text{g}/\text{kg}$. Pyrene and chrysene were also reported in sample MPT-13-SD-1 at estimated concentrations of 51 $\mu\text{g}/\text{kg}$ and 59 $\mu\text{g}/\text{kg}$, respectively. No other PAHs were reported in any other sediment samples.

The congener of DDT, 4,4'-DDE, was reported in two sediment samples ranging from 1.2 $\mu\text{g}/\text{kg}$ in sample MPT-13-SD-1 to 2.4 $\mu\text{g}/\text{kg}$ in sample MPT-13-SD-3 and its laboratory dilution sample, MPT-13-SD-3DL. 4,4'-DDD was reported in sample MPT-13-SD-3 and its laboratory dilution, MPT-13-SD-3DL, at 2.8 $\mu\text{g}/\text{kg}$ and 4.1 $\mu\text{g}/\text{kg}$, respectively. No sediment sample from SWMU 13 reported 4,4'-DDT. The pesticide chlordane was detected in sediment sample MPT-13-SD-1 at 9.4 $\mu\text{g}/\text{kg}$. This sample location is adjacent to landscaped areas associated with recreational land use and administrative office buildings. Metals were detected in the sediment samples, but not at levels which indicate a release of hazardous substances to the sediments at SWMU 13.

Soil Sample Results. Borehole soil samples (including one duplicate) were collected at SWMU 13 during new monitoring well construction. Borehole soil samples were collected at the water table elevation. The soil sample locations (MPT-13-4, MPT-13-4DUP, MPT-13-5, and MPT-13-6) are presented on Figure 4-57. Table 4-64 summarizes the detected organic and inorganic chemicals in the SWMU 13 soil samples. Low-level concentrations of VOC, PAHs, pesticides, and metals were randomly detected in these samples.

Detected VOCs included carbon disulfide, trichlorofluoromethane, and xylene (total). Carbon disulfide was estimated at 2 $\mu\text{g}/\text{kg}$ in the duplicate sample, MPT-13-4DUP, but not in sample MPT-13-4. Trichlorofluoromethane was detected at 36 $\mu\text{g}/\text{kg}$ in sample MPT-13-5. Total xylene was detected in sample MPT-13-4 and its duplicate, MPT-13-4DUP, at 5 $\mu\text{g}/\text{kg}$ (estimated) and 10 $\mu\text{g}/\text{kg}$, respectively, as well as in sample MPT-13-5 at an estimated concentration of 3 $\mu\text{g}/\text{kg}$.

The PAH pyrene was reported at an estimated concentration of 42 $\mu\text{g}/\text{kg}$ in sample MPT-13-5. The pesticide chlordane was detected in the duplicate sample MPT-13-4DUP, at 370 $\mu\text{g}/\text{kg}$. It was not reported in sample MPT-13-4. No other SVOCs, pesticides, or PCBs were reported in any soil samples.

Metals were reported in all soil samples; however, the range of concentrations and frequency of detection imply that they are not related to a release of hazardous substances to the soils of SWMU 13.

Groundwater Sample Results. Groundwater samples were collected from all six monitoring wells located at SWMU 13. Three of the wells had been installed previously during other environmental investigations (E.C. Jordan, 1988). Three new wells were installed during the Phase I RFI. Groundwater in the unconfined surficial aquifer at Mayport is classified Class G-II as defined by Chapter 17-3.403, FAC. Class G-II groundwater is potable-use groundwater in aquifers that have TDS contents of less than 10,000 mg/ℓ , unless

**Table 4-64
Detected Organic and Inorganic Chemicals in SWMU 13 Soil Samples**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20753		20753		20753		20753	
Sample Matrix:			Soil		Soil		Soil		Soil	
Location/Sample No.:			MPT-13-4		MPT-13-4DUP		MPT-13-5		MPT-13-6	
Date Sampled:			01/24/92		01/24/92		01/24/92		01/24/92	
CAS RN	Common Name	Units	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
75-15-0	Carbon disulfide	µg/kg			2	J				
75-69-4	Trichlorofluoromethane	µg/kg					36	J		
1330-20-7	Xylene (total)	µg/kg	5	J	10		3	J		
129-00-0	Pyrene	µg/kg					42	J		
57-74-09	Chlordane	µg/kg			370					
7440-38-2	Arsenic	mg/kg	0.52	J	0.36	J	0.17	J		
7440-39-3	Barium	mg/kg	7.5	J	8.1	J	6.6	J	2.5	J
7440-47-3	Chromium	mg/kg	2.8	J	3.5	J	2.1	J	1.8	J
7440-50-8	Copper	mg/kg	2	J	1.9	J	0.41	J	1.7	J
7440-92-1	Lead	mg/kg			2.8	J				
7440-02-0	Nickel	mg/kg	2.5	J	3.2	J				
7440-66-6	Zinc	mg/kg	19.4	J						

Notes: Laboratory data validated with NEESA Level C criteria.
 Conc. = concentration.
 Qual. = qualifier.
 µg/kg = micrograms per kilogram.
 "J" = estimated value.
 mg/kg = milligrams per kilogram.

otherwise classified. G-II groundwater should meet primary and secondary drinking water quality standards as listed in Chapters 17-550.310 and 550.320, FAC. TDS, as measured by a gravimetric method (USEPA Method 160.1), ranged from 456 mg/l in sample MPT-13-MW1-1 to 2,690 mg/l in sample MPT-13-MW4-1. Table 4-65 summarizes values measured at SWMU 13 of major groundwater quality parameters.

Table 4-65
General Water Quality for SWMU 13 Groundwater Samples

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

USEPA Method	Analyte	Unit	MPT-13-MW1-1	MPT-13-MW2-1	MPT-13-MW3-1	MPT-13-MW4-1	MPT-13-MW5-1	MPT-13-MW6-1
160.1	Total Dissolved Solids	mg/l	456	1,660	986	2,690	1,040	1,260
325.1	Chloride	mg/l	56.6	1,280	256	1,010	280	276
376.1	Sulfide	mg/l	<0.1	0.2	0.2	1.3	1.2	<0.1
375.4	Sulfate	mg/l	37.7	28.9	113	149	37.8	157

Notes: USEPA = U.S. Environmental Protection Agency.
mg/l = milligrams per liter.

General water quality of the surficial aquifer at SWMU 13 is characterized by saline conditions as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely, or limited at best. Although the surficial aquifer is classified G-II, secondary standards (Chapter 17.550.320, FAC) are exceeded in most of the surficial wells for TDS and chloride. Maximum contaminant levels as specified in Chapter 17.550.320, FAC, for TDS, chlorine, and sulfate are 500, 250, and 250 mg/l, respectively. Approximate median values in the unconfined surficial aquifer at SWMU 13 for these parameters are 1,070, 450, and 43 mg/l, respectively. Reducing conditions were also evident from the presence of sulfide in the surficial aquifer. Anaerobic conditions and the presence of sulfide in the surficial aquifer would reduce the mobility of metal contaminants if present.

Table 4-66 summarizes the results for potential chemicals-of-concern detected above quantitation limits in the SWMU 13 groundwater samples. Figure 4-58 also presents groundwater sample locations and laboratory results. Low concentrations of acetone and carbon disulfide were detected in some of the groundwater samples. No pesticides or PCBs were detected in any groundwater samples. Inorganic compounds (arsenic, barium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, and cyanide) were detected at low concentrations in groundwater samples. Samples for metals were collected without filtration and were preserved immediately after collection with acid. The metal results are therefore total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions.

Acetone was reported at a concentration of 61 µg/l in groundwater sample MPT-13-MW4-1. Carbon disulfide was reported at an estimated concentration of 1 µg/l in

Table 4-66
Detected Organic and Inorganic Chemicals in SWMU 13 Groundwater Samples

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Delivery Group:		20884	20884	20884	20850	20850	20850	20884	
Sample Matrix:		Water		Water		Water		Water	
Location/Sample No.:		MPT-13-MW1-1	MPT-13-MW2-1	MPT-13-MW3-1	MPT-13-MW4-1	MPT-13-MW5-1	MPT-13-MW6-1		
Date Sampled:		02/11/92		02/11/92		02/05/92		02/11/92	
CAS RN	Common Name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
67-64-1	Acetone								
75-15-0	Carbon disulfide								
7440-38-2	Arsenic	2.8	J	5.1	J	11.3	J	2.8	J
7440-39-3	Barium	10.9	J	9.6	J	63.3	J	15.7	J
7440-47-3	Chromium					56.6		11	
7440-50-8	Copper					19.8	J	69.5	J
7440-92-1	Lead					13.6	J	4.6	J
7440-97-6	Mercury			0.13	J				
7440-02-0	Nickel							146	
7440-49-2	Selenium					2.2	J		
7440-31-5	Tin								
7440-62-2	Vanadium	2.6	J	3	J	68.6	J	12.8	J
7440-66-6	Zinc	6.1	J	4.4	J	71.8	J	99.9	J
5955-70-0	Cyanide			4.5	J			3.3	J

Laboratory data validated with NEESA Level C criteria.

Notes: Conc. = concentration.
 Qual. = Qualifier.
 µg/l = micrograms per liter.
 "J" = estimated value.

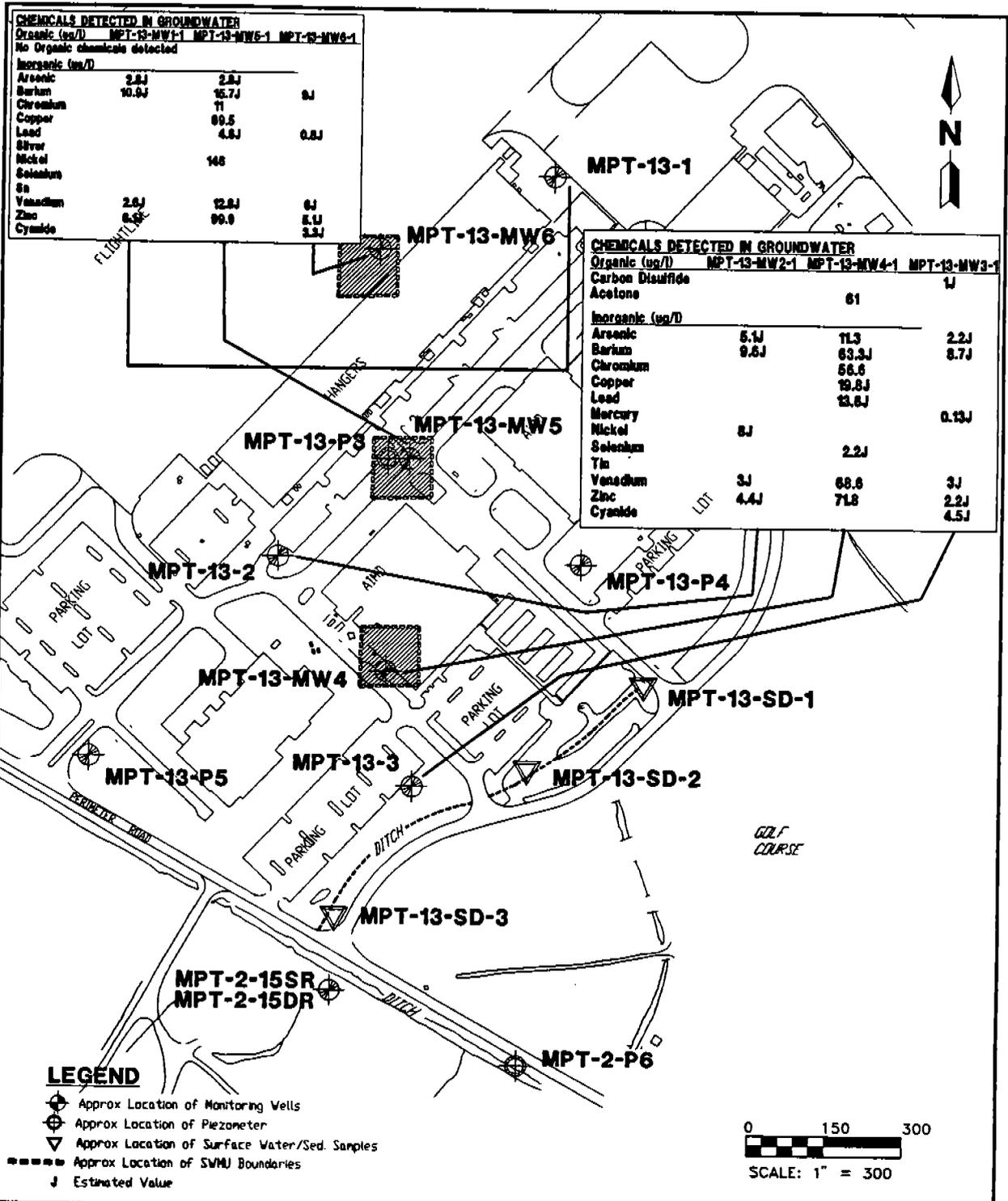


FIGURE 4-58
SWMU 13 - OLD FIRE FIGHTING TRAINING AREA
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN GROUNDWATER SAMPLES



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groundwater sample MPT-13-MW3-1. No other VOCs were reported in any other groundwater sample from SWMU 13. No SVOCs, pesticides, or PCBs were reported in any groundwater sample from SWMU 13.

The following metals were detected in samples collected from SWMU 13.

- Arsenic ranged from an estimated concentration of 2.2 $\mu\text{g}/\text{l}$ in sample MPT-13-MW3-1 to 11.3 $\mu\text{g}/\text{l}$ in sample MPT-13-MW4-1.
- Estimated barium concentrations ranged from 8.7 $\mu\text{g}/\text{l}$ in sample MPT-13-MW3-1 to 63.3 $\mu\text{g}/\text{l}$ in sample MPT-13-MW4-1.
- Chromium concentrations ranged from 11 $\mu\text{g}/\text{l}$ in sample MPT-13-MW5-1 to 56.6 $\mu\text{g}/\text{l}$ in sample MPT-13-MW4-1.
- Copper concentrations were estimated at 19.8 $\mu\text{g}/\text{l}$ in sample MPT-13-MW4-1 and 69.5 $\mu\text{g}/\text{l}$ in sample MPT-13-MW5-1.
- Estimated lead concentrations ranged from 0.8 $\mu\text{g}/\text{l}$ in sample MPT-13-MW6-1 to 13.6 $\mu\text{g}/\text{l}$ in sample MPT-13-MW4-1.
- Mercury was estimated in sample MPT-13-MW3-1 at 0.13 $\mu\text{g}/\text{l}$.
- Nickel concentrations ranged from an estimate of 8 $\mu\text{g}/\text{l}$ in sample MPT-13-MW2-1 to 146 $\mu\text{g}/\text{l}$ in sample MPT-13-MW5-1.
- Selenium was estimated at 2.2 $\mu\text{g}/\text{l}$ in sample MPT-13-MW4-1.
- Vanadium concentrations ranged from an estimate of 2.6 $\mu\text{g}/\text{l}$ in sample MPT-13-MW1-1 to 68.6 $\mu\text{g}/\text{l}$ in sample MPT-13-MW4-1.
- Zinc concentrations ranged from an estimate of 2.2 $\mu\text{g}/\text{l}$ in sample MPT-13-MW3-1 to 99.9 $\mu\text{g}/\text{l}$ in sample MPT-13-MW5-1.
- Estimated cyanide concentrations ranged from 3.3 $\mu\text{g}/\text{l}$ in sample MPT-13-MW6-1 to 4.5 $\mu\text{g}/\text{l}$ in sample MPT-13-MW3-1.

The data do not indicate groundwater contamination at SWMU 13. A small number of individual VOCs and metals were detected at or near quantitation limits, below FPDWS MCL, or at singular locations with no systematic pattern.

Acetone was detected in sample, MPT-13-MW4-1, at 61 $\mu\text{g}/\text{l}$; however, it is an individual detection and does not appear to be a site-related contaminant. Acetone is often an artifact associated with isopropyl alcohol, which is used as a sampling equipment decontamination fluid. Chromium was detected at levels above the FPDWS MCL. Chromium was measured at 56.6 $\mu\text{g}/\text{l}$ in sample MPT-13-MW4-1, which is above the FPDWS MCL of 50.0 $\mu\text{g}/\text{l}$. This sample also had the highest total dissolved solids measured in the SWMU 13 area (2,690 mg/l). The higher level of metals in this sample may be indicative of natural conditions. Nonetheless, the chromium detection in this sample was a localized, unique occurrence that does not indicate a systematic pattern of release of Appendix IX inorganic constituents into the groundwater at SWMU 13.

4.10 SWMU 22. BUILDING 1600 BLASTING AREA.

4.10.1 SWMU 22 Description Historic information on the permitted solid waste management units at NAVSTA Mayport has been consolidated in the IAS. The IAS was conducted under the Navy's earlier NACIP program that addressed the CERCLA of 1980. The following information on the disposal activities at SWMU 3, Landfill E, was obtained from this study (ESE, 1986).

The Building 1600 Blasting Area is a fenced area located just to the northeast of Building 1600, which is located in the central part of Mayport, about 400 feet northeast of SWMU 2 (Figure 4-59). Abrasive media blasting was conducted in a sheet metal Baker hut set on a concrete base and concrete foundation. The concrete base extends past the Baker hut approximately 10 feet and is encircled by a chain link fence. A dust collector attached to the back of the building collected dust and abrasives during blasting operations. Equipment blasted in this area was largely ground support equipment, most of which was painted with yellow enamel paint and zinc-containing primers. The abrasive media used for blasting was Black Beauty™. The used Black Beauty™ was analyzed by the Extraction Procedure and determined to be toxic. The area has been in use since 1985. Blasting operations have recently (1992) terminated at this site. It is presently used as a temporary storage area for ground support equipment.

4.10.2 Summary of Exploration and Sampling Program The exploration program at SWMU 22 included the following data-gathering activities:

- installating of a new monitoring well screened from 2 to 12 feet in the surficial aquifer to gather additional groundwater elevation data near SWMU 22,
- sampling and analyzing surficial and subsurface soils in an area of suspected soil contamination, and
- sampling and analyzing groundwater from the newly installed monitoring well.

The locations of these exploration and sampling activities at SWMU 22 are presented in Figure 5-59. The data-gathering activities were composed of the field activities listed below. Field activities followed the standard operating procedures in project-specific Technical Memoranda located in Appendix B, Site-Specific QAP of the RFI Workplan, Volume II (U.S. Navy, 1991b) and as summarized in Chapter 3.0 of this report. Table 4-67 summarizes the type, frequency, and media of samples collected at SWMU 22 during the Phase 1 RFI. Sample gathering activities within SWMU 22 included sampling soil adjacent to the water table during the installation of monitoring well MPT-22-MW-1 and sampling groundwater from the same well. Additionally, five surficial (including one duplicate) and four subsurface soil samples were collected from the perimeter of the area where blasting activities occurred. Surrounding monitoring wells and piezometers were used to supplement local and regional data on groundwater flow rate and direction.

Drilling and Subsurface Soil Sampling. Drilling and subsurface soil sampling were accomplished as described in the Technical Memorandum, Drilling and Subsurface Soil Sampling, Appendix B (U.S. Navy, 1991b). Borehole locations are

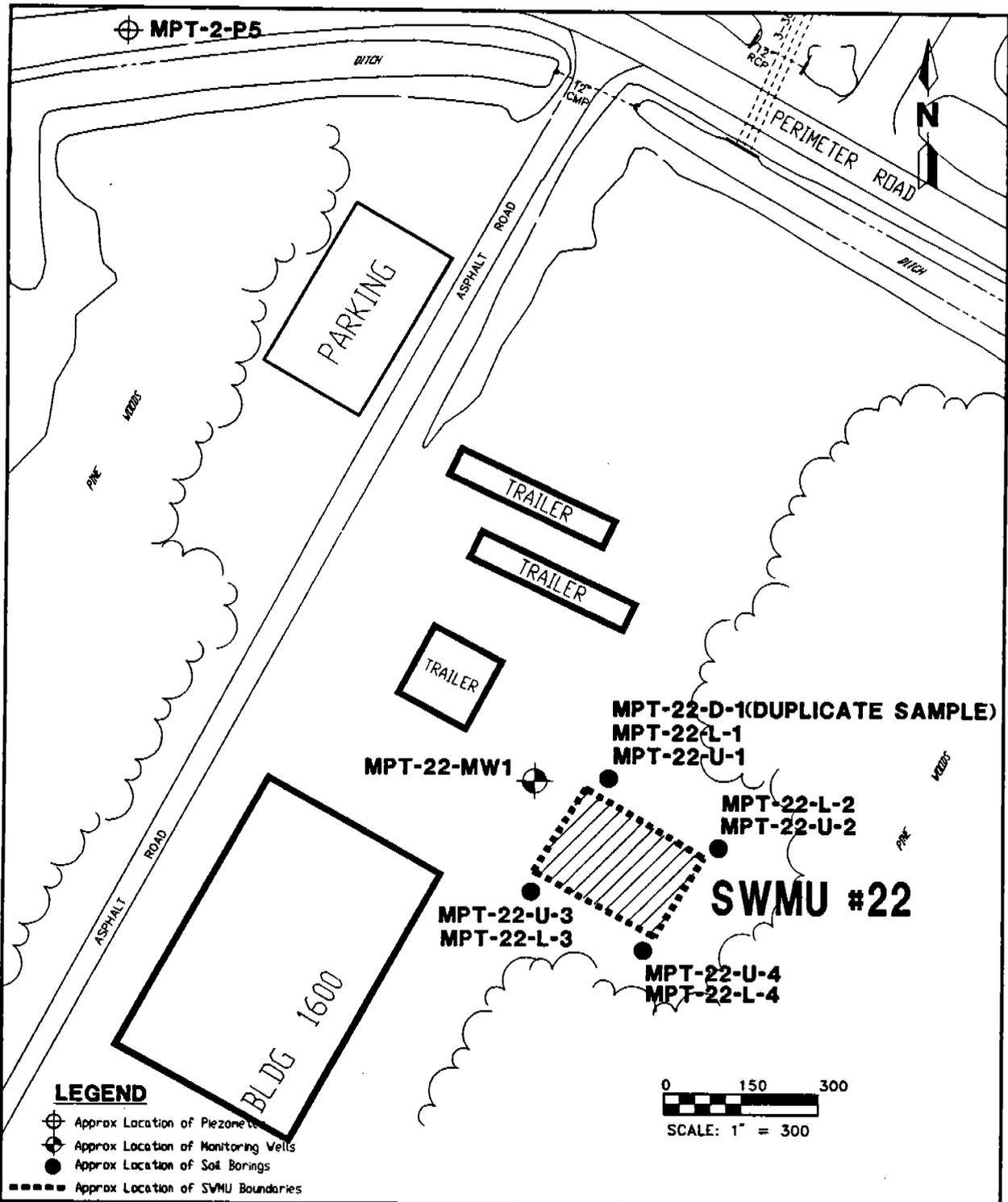


FIGURE 4-59
SWMU 22 - BUILDING 1600, BLASTING AREA
SITE PLAN



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shown in Figure 4-59. Subsurface soil samples were analyzed by the specified USEPA SW-846 methods. Selected physical parameters were also measured and included: Bulk density (ASTM D2937-83), cation exchange capacity (USEPA Method 9081), organic content (USEPA Method 9060), soil pH (USEPA Method 9045), particle size distribution (ASTM D422-63), and moisture content ASTM D2216-80).

Table 4-67
Summary of SWMU 22 Chemical Analyses

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Source	Media	U.S. Environmental Protection Agency SW-846 ¹						Totals
		Method 8240 VOC	Method 8270 SVOC	Method 6010, 7470, 7480 Metals	Method 8080 Pest/PCB	General Parameters (soil)	General Water Quality	
SWMU 22	Soil ²	10	10	10	10	1	0	41
	Groundwater ²	1	1	1	1	0	1	5

¹ Selected Appendix IX Groundwater Monitoring List Compounds as analyzed by method indicated.

² Includes field duplicate samples.

Notes: VOC = volatile organic compounds.
SVOC = semivolatile organic compounds.
Pest/PCB = organochlorine pesticides and polychlorinated biphenyls.
SWMU = solid waste management unit.

Table 4-68
Summary of SWMU 22 Monitoring Well Installation

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

SWMU Number	Piezometer and Monitoring Well No.	Phase	Diameter (inches)	Total Depth (feet)	Screened Interval (feet bls)
22	MPT-22-MW1	Phase 1 RFI	2	12	2 - 12

Notes: SWMU = solid waste management unit.
bls = below land surface.
ESI = Expanded Site Investigation; E.C. Jordan; conducted September 1987 to October 1987.
Phase 1 RFI = Phase 1 RCRA Facility Investigation; ABB Environmental Services; conducted January 1992 to March 1992.

4.10.2.1 Installation of Shallow Monitoring Well One new surficial aquifer monitoring well was installed during Phase 1 field activities at SWMU 22 (Figure 4-59). Table 4-68 summarizes the specifications of monitoring well MPT-22-MW-1. Monitoring well installation and development were accomplished as described in the Technical Memorandum, Monitoring Well Construction and Development, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b) and as described in Chapter 3.0, Piezometer and Monitoring Well Installation, of this report. Well installation and construction details for the monitoring well are presented in

Appendix A, Volume II, of this report. The well location is presented in Figure 4-59.

4.10.2.2 Surficial and Subsurface Soil Sampling Soil sampling was accomplished as described in the Technical Memorandum, Soil Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991b) and as described in Chapter 3.0, Soil Sampling, within this report. Nine soil samples including one duplicate were collected from four sample locations. Surficial and subsurface samples were co-located. Sample locations MPT-22-SS-1 through MPT-22-SS-4, MPT-22-SB-1 through MPT-22-SB-4, and one duplicate sample, MPT-22-D-1, are shown on Figure 4-59. Soil samples were analyzed by the specified USEPA SW-846 methods.

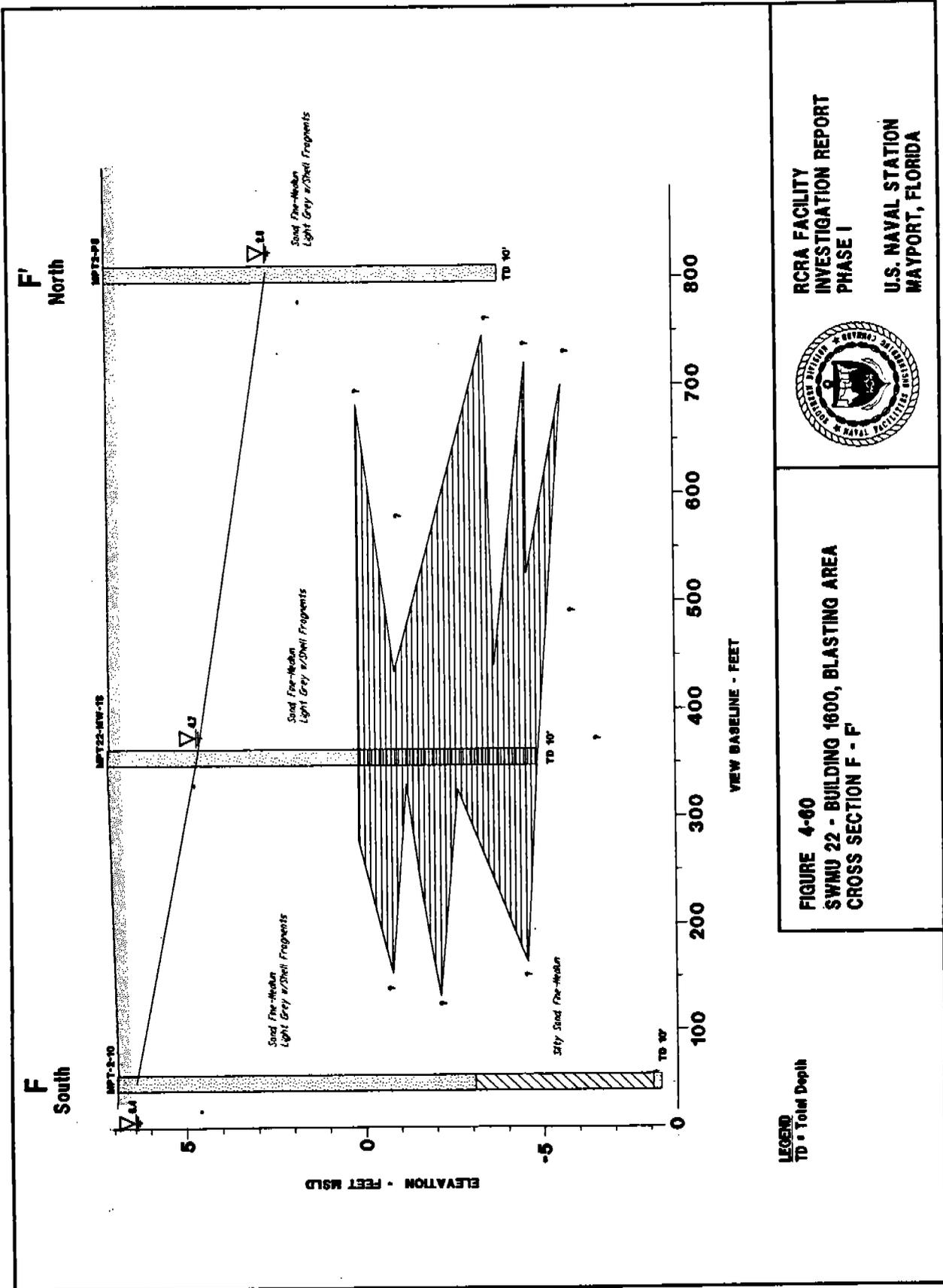
4.10.2.3 Groundwater Sampling Groundwater sampling was accomplished as described in the Technical Memorandum, Groundwater Sampling, Appendix B of the RFI Workplan, Volume II (U.S. Navy, 1991a) and as described in Chapter 3.0, Groundwater Sampling, within this report. One groundwater sample was collected from MPT-22-MW-1. The groundwater sample was analyzed in the laboratory for selected general water quality parameters in accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983).

4.10.3 Environmental Setting Surficial and subsurface soil, and groundwater are the media of concern at SWMU 22 based on the release scenario described above and analytical results from the ESI. This section summarizes the geological and hydrogeological factors affecting contaminant fate and migration in soil and groundwater at SWMU 22.

4.10.4 Geology This section describes the surficial geologic setting observed at SWMU 22 during the ESI and Phase I RFI. The upper surficial sediments consist of material dredged from the Mayport turning basin and the St. Johns River. Beneath these modern deposits are the Undifferentiated Post-Hawthorn Deposits of upper Miocene age and younger that, in turn, overlie the middle Miocene age Upper Hawthorn Group as determined from deep borings MPT-2-MW-16DD and MPT-2-MW-17DD (Leve, 1966). These deep borings are located to the west and southwest of SWMU 22. Physical characteristics of soils measured at SWMU 22 that affect contamination migration are also presented in this section.

4.10.4.1 SWMU 22, Geologic Setting Figure 4-60 shows a cross section summarizing the SWMU 22 geology. The cross section was composed from boring logs of monitoring wells and piezometers installed at or near SWMU 22. The cross section illustrates features typical of the Group I SWMUs. The uppermost unit consist of material dredged from the Mayport turning basin and the St. Johns River and is composed of sands, shelly sands, shell beds, silts, and minor amounts of clay. Typically, beneath the surficial dredge material a uniform poorly graded, well sorted, sand (SP) with lenses of a very soft grey to dark-grey clay (CH, CM) are found. This sand unit, termed in the cross section undifferentiated post-Hawthorn deposits, consists of highly variable sediments including sands, shelly sands, coquina, silts, clay, and shell beds. This unit grades at depth into the third relatively impermeable unit, the Coosawhatchie Formation of the Upper Hawthorn Group (Scott, 1988).

4.10.4.2 Physical Characteristics of SWMU 22 Soil Facility-wide grain-size distribution analyses show that soil samples typically consist of graded fine-



LEGEND
TD = Total Depth

FIGURE 4-60
SWMU 22 - BUILDING 1600, BLASTING AREA
CROSS SECTION F - F'



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grained sand (Table 4-69). SWMU 22 soils as represented by sample MPT-22-1S is classed as SP soil (USCS), consisting of 50 percent fine-grained sand size material, 25 percent medium-grained sand size material, and 25 percent coarse-grained sand size material.

Table 4-69
SWMU 22 Soil Uniformity Coefficient

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample	Percent Sand			Uniformity Coefficient, Cu ¹
	F	M	C	
MPT-22-1S	50	25	25	4.8

¹ Cu = D₆₀/D₁₀
Cu < 4 = well sorted, poorly graded.
Cu > 6 = poorly sorted, well graded.

Notes: F = fine.
M = medium.
C = coarse.

Based on the observed particle distribution, an estimated effective porosity range of 0.25 to 0.35 appears reasonable (0.25 is used for the estimation of average groundwater velocities) for the unconsolidated deposits of sand, shells, and clay of the surficial aquifer at SWMU 22. The organic content (less than 1 percent) and ion exchange capacity (less than 2.2 milliequivalents per 100 grams) of the soils is relatively low as summarized in Table 4-70. This implies that retardation of contaminants in groundwater flow will be small and, therefore, soluble contaminants will travel at the same velocity as the groundwater.

4.10.4.3 Hydrogeology The hydrogeologic investigations conducted at SWMU 22 during the Phase I RFI collected data to characterize the potentiometric surface of the water table aquifer, estimated the hydraulic conductivities, and computed the average velocity of the groundwater flow in the uppermost aquifer at the site. These parameters were estimated based on groundwater elevation measurements, *in-situ* permeability testing (i.e., slug-tests), and soil characteristics of the aquifer formation. Darcy's Law was used to estimate average groundwater flow velocities.

Average Potentiometric Surface. Water table elevations were measured at MPT-22-MW-1 on February 16, and March 25, 1992. Potentiometric surface elevations ranged from a high of 4.81 feet above msl in February to a low of 4.62 feet above msl in March. Data from nearby monitoring wells were used to generate the potentiometric surface shown on Figure 4-61.

Surficial groundwater flow originates from a localized mound (see Figure 4-4) located to the south in the eastern dredge spoil area. Flow from the mounded area is to the north across SWMU 22 to a ditch that parallels Perimeter Road and, ultimately, to the St. Johns River.

**Table 4-70
SWMU 22 Physical Soil Characteristics**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Matrix:	Soil
Location/Sample No.:	MPT-22-1S
Analyte	
Percent moisture	15.7
Soil bulk density	1.57
Cation exchange capacity	2.1
pH	8.44
TOC	6,650

Notes: Soil bulk density = grams per cubic centimeter.
Cation exchange capacity = milliequivalents per 100 grams.
pH = standard units.
TOC = total organic carbon in milligrams per liter.

Tidal Influence. Data collected from wells located in the interior of NAVSTA Mayport indicate that minimal fluctuation occurs in groundwater levels relative to tidal influences. Groundwater response is weak to non-existent. Correspondingly MPT-22-MW-1, which is located in the interior, exhibits limited or no response.

Aquifer Slug Test. Both rising- and falling-head slug tests were conducted at monitoring wells MPT-2-5 and MPT-2-6 located in the vicinity of SWMU 22. Typically three to five trials were conducted at these wells in order to provide an average of the estimated hydraulic conductivities (K) of the aquifer in the vicinity of the screened intervals. From the multiple trials, the precision of the K data was also evaluated.

MPT-2-5 had an *in-situ* conductivity of approximately 5.7 feet per day. This monitoring well was screened in the surficial aquifer between 2.5 to 10 feet bls in medium-grained sand grading into clay to clayey sands. MPT-2-6 had an *in-situ* conductivity of approximately 2.8 feet per day. This monitoring well was screened in the surficial aquifer between 2.5 and 10 feet bls in fine-grained silty sand grading into gravel-sized shell fragments (Volume II, Appendix A, Boring Logs).

Groundwater Gradient and Flow Velocity. Water table elevations were measured on February 16, March 25, and April 20, 1992 for selected piezometers and monitoring wells throughout NAVSTA Mayport. Facility-wide water table elevations were measured within a 4-hour period during each measurement event. Table 4-71 presents the water table measurements at SWMU 22 for February 16, March 25, and April 20, 1992.

Facility-wide potentiometric maps were developed for each monthly measurement event. Because no significant monthly variation was observed on a facility wide

**Table 4-71
Summary of SWMU 22 Water Level Data**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Well/Piezometer	X Easting State Plane ¹	Y Northing State Plane ¹	Z Elev. (MSL)	Water Level 02/16/92			Water Level 03/25/92			Water Level 04/20/92			Avg. Elev. ² (MSL)	Depth Standard Deviation ³
				Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)		
MPT-22-MW-1	366562.711	2200638.399	6.93	02:03 am	2.12	4.81	12:24 pm	2.31	4.62	6:25 p.m.	2.43	4.72	4.86	0.13

¹Florida State Plane Coordinate System.

²Arithmetic average of all water level measurements for each well.

³Standard deviation of all water level measurements for each well.

Notes: Elev. = elevation.

MSL = mean sea level.

LCL = local.

TOC = top of casing as datum.

NM = not measured.

basis (the coefficient of variation of groundwater elevations was less than 1), an average potentiometric surface data map was developed using all three groundwater survey elevation events. The estimated water-table map for SWMU 22 using these data is presented in Figure 4-61.

Average groundwater velocities were calculated based on Darcy's Law using estimates of porosity, permeability, and aquifer gradients obtained from field and laboratory observations. Table 4-72 summarizes the parameters and estimated velocities. Groundwater flows radially from the groundwater mound centered within the eastern dredge spoil area towards the north. Gradients are higher near the elevated dredge spoil area and decrease at SWMU 22 and the tidally influenced drainage ditch that parallels Perimeter Road.

Table 4-72
Estimation of Groundwater Velocity at SWMU 22 Based on Darcy's Law

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Location	Estimated Effective Porosity (percent)	Hydraulic Conductivity (feet/day) ¹	Estimated Gradient (feet/feet)	Calculated Average Velocity (feet/day)	Estimated Average Velocity (feet/day)
MPT-2-10	0.35	0.03	0.00465	0.0004	0.0004
MPT-2-5	0.35	5.7	0.00465	0.0757	0.08

¹Measured during the Expanded Site Inspection, October 1987 (E.C. Jordan, 1988).

The average groundwater velocity near SWMU 22 is approximately 0.04 feet per day near MPT-2-10 and MPT-2-5.

4.10.5 Release Characteristics This section describes the extent of contamination observed at SWMU 22, Building 1600 Sand Blasting Area, during the Phase 1 investigation. Investigations described in this section of the report include: subsurface soil investigation and a groundwater investigation.

The samples of environmental media (soil and groundwater) were analyzed for organic and inorganic constituents by USEPA SW-846 Methods 8240 (VOCs), 8270 (SVOCs), 8080 (organochlorine pesticides and PCBs), 6010 (metals by ICP), 7420 (metals by GFAA), 7470 (metals by CVAA), and 9010 (cyanide).

The laboratory data for the selected Appendix IX analyses were validated in accordance with NEESA Level C requirements (NEESA, 1988) to determine data of known quality for site characterization and risk assessment. The data were either accepted without qualification, accepted as estimated values, or rejected. Chapter discusses the data validation findings, and data validation narratives are presented in Volume III, Appendix E.

Groundwater samples were also analyzed in the laboratory for the following general water quality parameters: TDS, chloride, alkalinity (as CaCO₃), hardness (as CaCO₃), sulfate, sulfide, TKN, ammonia (total), nitrite and nitrate, total phosphorous, TOC, oil and grease, color, and pH. Analyses were conducted in

accordance with the methodologies described in *Methods for Chemical Analysis of Water and Waste*, EPA-600/4-79-020 (revised 1983). These are non-CLP methodologies, and general water quality samples were collected and analyzed in accordance with NEESA Level E guidelines (NEESA, 1988).

4.10.5.1 Soil Sample Results Table 4-73 summarizes the validated analytical results for soil samples collected at SWMU 22. One borehole soil sample was collected at SWMU 22 from above the observed water table during monitoring well construction. Nine soil samples, MPT-22-U1 through MPT-22-U4, MPT-22-L1 through MPT-22-L4, and the duplicate MPT-22-D-1, were collected from four surface and subsurface samples. Both the borehole soil and surface soil sample locations are shown in Figure 4-62.

No detections of VOCs, SVOCs, or PCBs were reported. Benzo(a)pyrene a polycyclic aromatic hydrocarbon was reported in soil sample MPT-22-U1 at 70 mg/kg but was not detected in the duplicate sample MPT-22-D1. Benzo(a)pyrene, if present, binds strongly to organic carbon in soil and would not be expected to migrate from its reported location.

Various metals were reported in all samples at low levels near method detection limits. Many of the reported metal concentrations are labeled as estimates because they are above the instrument detection limit reported by the laboratory, but are below the Contract Required Quantitation Limit (CRQL) for the methodology (USEPA, 1988c). The majority of samples have metals concentrations within a relatively narrow range of low values suggesting that they represent normal background levels. The soil samples that exhibit slightly elevated levels relative to adjacent samples are at concentrations indicating there has been no release to the environment. The range of concentrations and frequency of detection imply that the observed metals are naturally occurring and are not related to a release of hazardous substances to the environment.

4.10.5.2 Groundwater Sample Results A groundwater sample was collected from monitoring well MPT-22-MW-1 located at SWMU 22. This well was installed during the Phase I RFI. Groundwater in the unconfined surficial aquifer at Mayport is classified Class G-II as defined by Chapter 17-3.403, FAC. Class G-II groundwater is potable-use groundwater in aquifers that have TDS contents of less than 10,000 mg/l, unless otherwise classified. G-II groundwater should meet primary and secondary drinking water quality standards as listed in Chapters 17-550.310 and 550.320, FAC. TDS, as measured by a gravimetric Method (USEPA Method 160.1), was reported at 1,420 mg/l in a sample from monitoring well MPT-22-MW-1. TDS was also measured in hydrologically cross-gradient wells MPT-2-MW-9S, and MPT-2-MW-9D located approximately 400 feet to the southwest. TDS was 8,340 mg/l in sample from MPT-2-MW-9S, which is screened from 3 to 10 feet bls, and 32,000 mg/l in a sample from MPT-2-MW-9D, which is screened from 15 to 25 feet bls.

General water quality of the surficial aquifer adjacent to SWMU 22 is characterized by increasing saline conditions with increasing depth as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely, or limited at best. Although the surficial aquifer is classified G-II, secondary standards (Chapter 17.550.320, FAC) are exceeded in most of the surficial wells for TDS, chloride, and sulfate. Maximum contaminant levels as specified in Chapter 17.550.320, FAC,

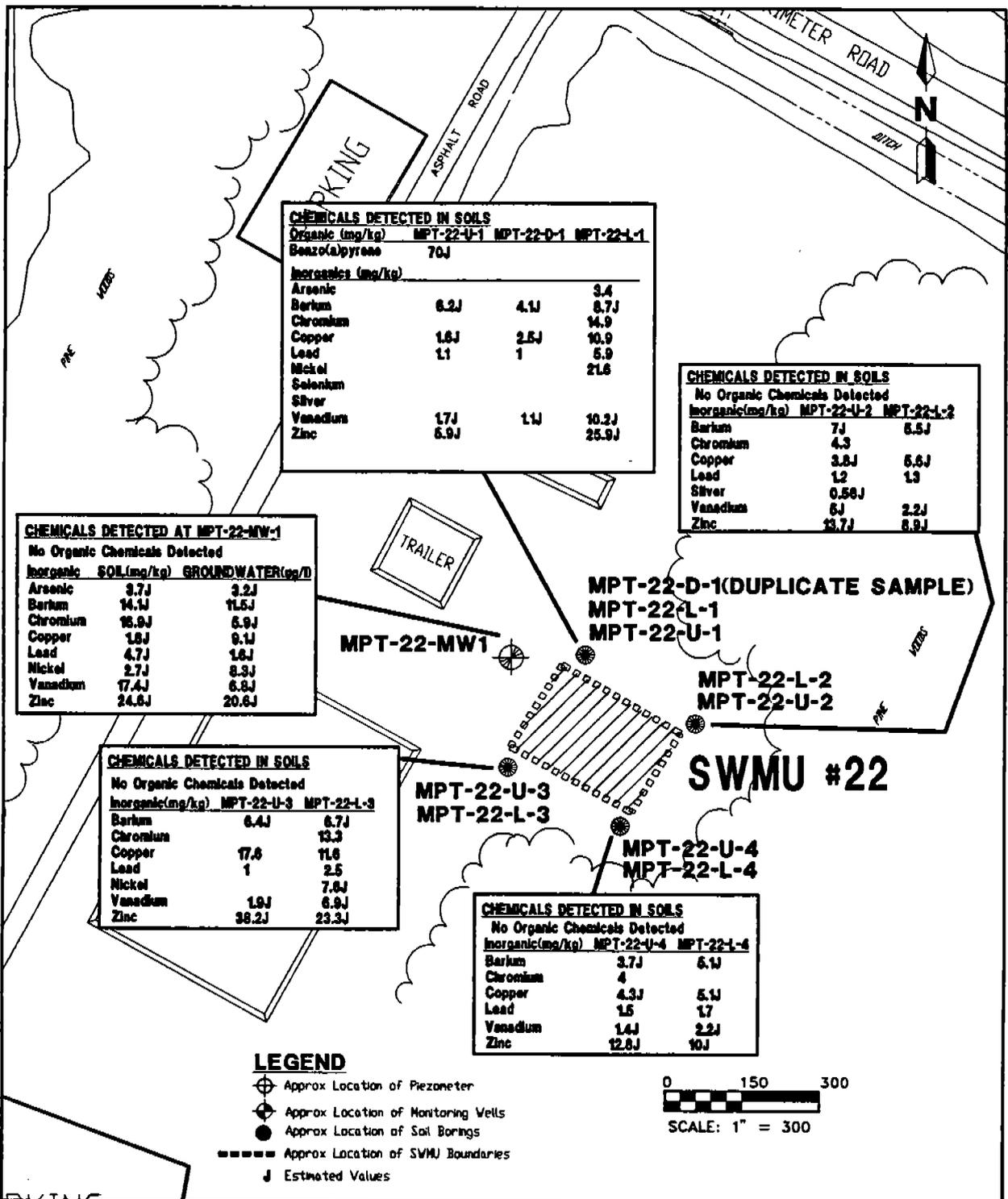


FIGURE 4-62
SWMU 22 - BUILDING 1600, BLASTING AREA
DETECTED ORGANIC AND INORGANIC CHEMICALS
IN SOIL AND GROUNDWATER



RCRA FACILITY
INVESTIGATION REPORT
PHASE I

U.S. NAVAL STATION
MAYPORT, FLORIDA

Table 4-73
Detected Organic and Inorganic Chemicals in SWMU 22 Soil Samples

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Delivery Group: Sample Matrix: Location/Sample No.:	20753		21171		21171		21171		21171	
	Soil		Soil		Soil		Soil		Soil	
Date Sampled:	MPT-22-1S	MPT-22-U1	MPT-22-D-1	MPT-22-L-1	MPT-22-U-2					
CAS RN	01/24/92	03/11/92	03/11/92	03/11/92	03/11/92	Conc.	Qual.	Conc.	Qual.	
Common Name	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Qual.	Conc.	Qual.	
Units	Qual.	Qual.	Qual.	Qual.	Qual.	Conc.	Qual.	Conc.	Qual.	
50-32-8	3.7	70								
Benzo(e)pyrene	J	J								
7440-38-2	14.1	6.2	4.1	3.4	7					
Arsenic	J	J	J	J	J					
Barium	16.9	1.6	2.5	14.9	4.3					
Chromium	J	J	J	J	J					
7440-47-3	1.8	1.1	1	10.9	3.8					
Copper	J	J	J	J	J					
7440-50-8	4.7	2.7	1.1	5.9	1.2					
Lead	J	J	J	J	J					
7440-92-1	2.7	17.4	1.1	21.6	0.56					
Nickel	J	J	J	J	J					
7440-02-0	17.4	24.6	1.1	10.2	5					
Silver	J	J	J	J	J					
7440-22-4	24.6	25.9	1.1	25.9	13.7					
Vanadium	J	J	J	J	J					
7440-62-2	J	J	J	J	J					
Zinc	J	J	J	J	J					
7440-66-6	J	J	J	J	J					

See notes at end of table.

Table 4-73 (Continued)
Detected Organic and Inorganic Chemicals in SWMU 22 Soil Samples

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Sample Delivery Group:		21171		21171		21171		21171		21171	
Sample Matrix:		Soil		Soil		Soil		Soil		Soil	
Location/Sample No.:		MPT-22-L-2		MPT-22-U-3		MPT-22-L-3		MPT-22-U-4		MPT-22-L-4	
Date Sampled:		03/11/92		03/11/92		03/11/92		03/11/92		03/11/92	
CAS RN	Common Name	Conc.	Qual.								
7440-39-3	Barium	5.5	J	6.4	J	6.7	J	3.7	J	5.1	J
7440-47-3	Chromium					13.3		4			
7440-50-8	Copper	5.6	J	17.6		11.6		4.3	J	5.1	J
7440-92-1	Lead	1.3		1		2.5		1.5		1.7	
7440-02-0	Nickel					7.6	J				
7440-62-2	Vanadium	2.2	J	1.9	J	6.9	J	1.4	J	2.2	J
7440-66-6	Zinc	8.9	J	38.2	J	23.3	J	12.8	J	10	J

Notes: Laboratory data validated with NEESA Level C criteria.
 Conc. = concentration.
 Qual. = qualifier.
 µg/kg = micrograms per kilogram.
 *J = estimated value.
 mg/kg = milligrams per kilogram.

for TDS, chloride, and sulfate are 500, 250, and 250 mg/l, respectively. Measured average values in the unconfined surficial aquifer adjacent to SWMU 22 for these parameters are 4,320, 12,946, and 169 mg/l, respectively. Only sulfate averages below secondary standards in the shallow aquifer at SWMU 2.

Reducing conditions were also evident from the presence of sulfide and ammonia nitrogen in the surficial aquifer. Anaerobic conditions and the presence of sulfide in the surficial aquifer would reduce the mobility of possible metal contaminants if present.

Table 4-74 summarizes the results for potential chemicals-of-concern detected above quantitation limits in the SWMU 22 groundwater samples. Figure 4-62 also presents sample locations and laboratory results. No VOCs, SVOCs, PAHs, pesticides, or PCBs were detected in the groundwater sample. Inorganic compounds (arsenic, barium, chromium, copper, lead, nickel, vanadium, and zinc) were detected at low concentrations and as estimated quantities in the groundwater sample. Barium, chromium, copper, nickel, and zinc were reported at levels which slightly exceed levels detected in the two background monitoring wells MW-1-1 and S-1 the three remaining constituents were detected at levels below background levels.

The sample for metals was collected without filtration and were preserved immediately after collection with acid. The metal results are therefore total concentrations and reflect both filterable (dissolved) and non-filterable (suspended solids) fractions.

In summary, the data do not indicate groundwater contamination at SWMU 22. No VOCs, SVOCs, PAHs, pesticides, or PCBs were detected. Metals detected were estimated quantities at or near the quantitation limit, below Florida's Primary Drinking Water Standards (FPDWS) Maximum Contaminant Levels (MCL). The concentrations of chemicals detected would be expected to be much higher if either organic or inorganic contamination were present in Group I area groundwater.

**Table 4-74
Detected Inorganic Chemicals in SWMU 22
Groundwater Sample**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Sample Delivery Group:			20837	
Sample Matrix:			Water	
Location/Sample No.:			MPT-22-MW1-1	
Date Sampled:			02/05/92	
CAS RN	Common Name	Units	Conc.	Qual.
7440-38-2	Arsenic	$\mu\text{g}/\text{l}$	3.2	J
7440-39-3	Barium	$\mu\text{g}/\text{l}$	11.5	J
7440-47-3	Chromium	$\mu\text{g}/\text{l}$	5.9	J
7440-50-8	Copper	$\mu\text{g}/\text{l}$	9.1	J
7440-92-1	Lead	$\mu\text{g}/\text{l}$	1.6	J
7440-02-0	Nickel	$\mu\text{g}/\text{l}$	8.3	J
7440-62-2	Vanadium	$\mu\text{g}/\text{l}$	6.8	J
7440-66-6	Zinc	$\mu\text{g}/\text{l}$	20.6	J
<p>Notes: Laboratory data validated with NEESA Level C criteria. Conc. = concentration. Qual. = Qualifier. $\mu\text{g}/\text{l}$ = micrograms per liter. "J" = estimated value.</p>				

5.0 HEALTH AND ENVIRONMENTAL ASSESSMENT

This section discusses the findings of the Health and Environmental Assessment (HEA) for the Group I SWMUs. The HEA was conducted according to standard USEPA and FDER guidelines. These standard guidelines are found in the following documents:

- RCRA Facility Investigation Guidance (USEPA, 1989b),
- Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A) (USEPA, 1989c),
- Exposure Factor Handbook (USEPA, 1990b),
- Corrective Action for Solid Waste Management Units at Hazardous Management Facilities; Proposed Rule (USEPA, 1990a),
- Risk Assessment Guidelines for Non-Superfund Sites (FDER, 1990),
- Supplemental Region IV Risk Assessment Guidance (USEPA, 1991e),
- Ecological Assessment of Superfund Sites: An Overview (USEPA, 1991b),
- Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors (USEPA, 1991c),
- Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference (USEPA, 1991a),
- Health Effects Assessment Summary Tables, (USEPA, 1992), and
- Risk Assessment Guidance for Superfund Vol. II: Environmental Evaluation Manual (USEPA, 1989c).

Because the methodologies used to estimate human health risks are significantly different from those used to estimate environmental risks, this HEA is divided into two sections, a human health section and an environmental section. The human health section evaluates the risks associated with human exposure to chemical contaminants at each individual SWMU at NAVSTA Mayport. The environmental section provides a similar evaluation for ecological receptors.

5.1 HUMAN HEALTH ASSESSMENT. The purpose of the Human Health Assessment is to evaluate whether any releases or potential releases are a threat to human health and require an interim corrective measure study or a corrective measure study. The human health assessment may also be used to support no further action or monitoring only decisions if appropriate.

USEPA (1991b) suggests that chemicals detected at SWMUs be screened against appropriate health and environmental criteria to identify those chemicals present in sufficient concentrations to potentially cause health or environmental threats. This screening process is accomplished by comparing concentrations of chemicals detected in each media to several different criteria. These criteria

include local and regional background levels as well as USEPA and Florida Department of Environmental Regulation (FDER) media-specific regulatory guidelines. Chemicals detected at concentrations exceeding these health and environmental screening criteria for each media are termed potential chemicals of concern or COCs.

When comparing detected chemical concentrations to background levels, USEPA guidance (1991b) states that the list of COCs will contain all "inorganics which are detected at concentrations significantly above background samples. (The criteria for determining significance should generally be 2 times the background concentration.)" Also the Geometric means of the sample and the background concentrations are used in this comparison.

The media-specific Screening Criteria Values (SCVs) used to screen detected chemicals include State and Federal MCLs and action levels calculated to present cancer risks of 1×10^{-6} (1 in a million) or a hazard index (HI) of 1.0. The procedures for calculating action levels and a compendium of calculated values are presented in a proposed rule published in the *Federal Register* (USEPA, 1990d). Additionally, the rule suggests that "if environmental levels were found to be below the action levels, no further action would ordinarily be required" (USEPA 1990d).

The action levels used in this HEA were either derived using the recommended methodology (USEPA, 1990d) or taken from the Appendices of the proposed rule (USEPA, 1990d). The exposure assumptions used to derive the action levels are as follows.

Ingestion of Soil (Carcinogens)

$$SCV = \frac{[R \times BW \times LT]}{[CSF \times I \times A \times ED]} \quad (1)$$

where

- SCV = screening criteria value (mg/kg);
- R = assumed risk level (unitless), 1×10^{-6} for class A and B carcinogens, 1×10^{-5} for class C carcinogens;
- BW = body weight (kg); 70 kg for adults;
- LT = assumed lifetime (years); default is 70 years;
- CSF = cancer slope factor; a chemical-specific toxicity factor relating intake to the probability of developing cancer from the chemical exposure; units are per milligrams per kilogram per day $(\text{mg}/\text{kg}/\text{day})^{-1}$;
- I = intake in milligrams per kilogram (mg/kg); default is 100 milligrams per day (mg/day);
- A = absorption factor (unitless), 1.0 (100%) is the default; and
- ED = exposure duration (days), default is 25,550 days (70 years);

Ingestion of Soil (Non-Carcinogens)

$$SCV = \frac{[RfD \times BW]}{[I \times A]} \quad (2)$$

where

- SCV = screening criteria value (mg/kg);
- RfD = oral chronic reference dose, a chemical-specific toxicity factor representing a dose to which all persons could be exposed to daily without suffering any adverse health effects; units are mg/kg/day
- BW = body weight, 16 kg for a child;
- I = intake (mg/day), default is 200 mg/day; and
- A = absorption factor (unitless), 1.0 (100 percent) is the default.

Ingestion of Water (Carcinogens)

$$SCV = \frac{[R \times BW \times LT]}{[CSF \times I \times A \times ED]} \quad (3)$$

where

- SCV = screening criteria value (mg/l);
- R = assumed risk level (unitless), 1×10^{-6} for class A and B carcinogens, 1×10^{-5} for class C carcinogens;
- BW = body weight (kg), 70 kg for adults;
- LT = assumed lifetime (years); default is 70 years;
- CSF = cancer slope factor, a chemical-specific toxicity factor relating intake to the probability of developing cancer from the chemical exposure; units are per milligrams per kilogram per day $(\text{mg/kg/day})^{-1}$,
- I = intake (l/day), default is 2 l/day;
- A = absorption factor (unitless), 1.0 (100 percent) is the default; and
- ED = exposure Duration (days), default is 25,550 days (70 years).

Ingestion of Water (Non-Carcinogens)

$$SCV = \frac{[RfD \times BW]}{[I \times A]} \quad (4)$$

where

- SCV = screening criteria value (mg/kg);
- RfD = oral chronic reference dose (mg/kg/day), a chemical-specific toxicity factor representing a dose to which all persons could be exposed to daily without suffering any adverse health effects;
- BW = body weight, default 70 kg an adult;
- I = intake in l/day, default is 2 l/day; and
- A = absorption factor (unitless), 1.0 (100 percent) is the default.

There are some chemicals for which SCVs cannot be derived due to the lack of information from the USEPA. An example is lead in soil. Although the USEPA currently classifies lead as a class B2 probable human carcinogen and recognizes lead as a significant non-carcinogen health threat, it provides neither a Cancer

Slope Factor (CSF) nor a Reference Dose (RfD) for guidance in human health risk assessment. Therefore, a soil SCV for lead cannot be derived using the methodology described above.

The USEPA has previously recommended a soil lead concentration of 500 to 1,000 mg/kg as target levels for cleanups at lead sites (USEPA, 1989a). The lower end of this range is used, in the absence of a toxicity-based value, as the SCV level for lead in soil for this Human Health Effects Assessment. The Federal and FDER MCL for lead in drinking water will be used as the SCV for lead in water.

Based upon the comparison of detected chemical concentrations in each media to background levels and the two screening criteria, a decision is made as to whether the chemical is considered a COC. As per USEPA guidance, only these COCs are considered further in the HEA.

After the COCs are identified for each media, the next step is to estimate COC concentrations to which humans living in the area might be exposed. Because this single COC concentration is used to assess the human health risks associated with exposure at that site, it is very important that this value be representative of the actual conditions at the site. Therefore, USEPA Region IV (USEPA, 1991e) has provided clear guidance for estimating this parameter, called the exposure point concentration (EPC).

First, concentration data are log transformed, and the 95 percent Upper Confidence Limit (UCL) of the mean of the transformed data is calculated. The formula to calculate the UCL of the log transformed data is:

$$UCL = e^{(\bar{x} + 0.5s^2 + sH/\sqrt{n-1})} \quad (5)$$

where:

- UCL = the 95th percent upper confidence limit of the mean,
- e = 2.71828,
- \bar{x} = the arithmetic mean of the transformed data,
- s = the standard deviation of the transformed data
- H = statistical variable obtained from Table A12 of Gilbert (1987), and
- n = number of samples.

For each chemical, the 95 percent UCL is then compared with the maximum detected concentration. If the 95 percent UCL does not exceed the maximum concentration of the chemical actually detected onsite, the 95 percent UCL is used as the EPC. But, if the 95 percent UCL exceeds the maximum detected concentration, the maximum detected concentration is used, instead of the 95 percent UCL, as the EPC.

Once the COCs are identified and the appropriate EPCs are selected, the next step is to calculate the dose of each COC that a human might receive by each exposure route.

The USEPA uses different approaches to calculate dose levels for carcinogenic and non-carcinogenic COCs. The Average Daily Dose (ADD) is the amount of a chemical taken in, expressed as a function of body weight per day. For carcinogens, the ADDs received during a limited part of an individual's life are adjusted to a

lifetime average. This averaging of a chemical exposure over a lifetime results in the Lifetime Average Daily Dose (LADD).

When soil ingestion is the route of exposure to the COCs, the ADD (or LADD) is calculated, using standard USEPA default values (USEPA, 1989c; 1991e) by the equation:

$$ADD \text{ (or LADD) (mg/kg/day)} = \frac{[C_s \times IR \times EF \times ED \times 10^{-3}]}{[BW \times AT]} \quad (6)$$

where

- C_s = chemical concentration in soil, ($\mu\text{g}/\text{kg}$),
- IR = ingestion rate, (100 mg/day for adults, 200 mg/day for children under 6 years old),
- EF = exposure frequency, (350 [days per year [days/yr]]),
- ED = exposure duration, (30 years),
- 10^{-3} = Conversion Factor, (10^{-3} milligram per micrograms [$\text{mg}/\mu\text{g}$]),
- BW = body weight, (70 kg for adults and 16 kg for children under 6 years old), and
- AT = averaging time (ED times 350 days/yr for ADD; 70 years times 365 days/yr for LADD).

If water consumption is the exposure route, the ADD (or LADD) is calculated using standard USEPA default values (USEPA, 1989c; 1991e), by the equation:

$$ADD \text{ (or LADD) (mg/kg/day)} = \frac{[C_w \times IR \times EF \times ED \times 10^{-3}]}{[BW \times AT]} \quad (7)$$

where

- C_w = chemical concentration in water ($\mu\text{g}/\text{kg}$),
- IR = ingestion rate, (2 L/day for adults),
- EF = exposure frequency (350 days/yr),
- ED = exposure duration (30 years),
- 10^{-3} = conversion factor (10^{-3} mg/ μg),
- BW = body weight (70 kg for adults), and
- AT = averaging time (ED times 365 days/yr for ADD; 70 years times 365 days/yr for LADD).

Another route of exposure to COCs is inhalation. This can occur either through inhalation of COC vapors or through inhalation of dust particles to which COCs are adsorbed. When inhalation is the route of exposure, the EPC is calculated in a different manner than it is for other exposure routes.

Although it is possible to be exposed to COCs vapors as they volatilize through the soil, a more common route of exposure is through volatilization of COCs from water. An example of this exposure route is volatilization from contaminated water during showering. The close confines of a shower and the elevated water temperature normally used in showering increase the potential for this chemical exposure route. The relationship between COC concentrations in the contaminated

water and the air, called the cross-media contamination transfer, is calculated using the equation:

$$C_a = \frac{[C_w \times VF \times FL \times D]}{V} \quad (8)$$

where

- C_a = contaminant concentration in bathroom air at end of shower ($\mu\text{g}/\text{m}^3$),
- C_w = contaminant concentration in shower water ($\mu\text{g}/\ell$),
- VF = fraction of contaminant volatilized (0.75)
- FL = flow rate of shower water (600 L/hr),
- D = duration of shower (0.2 hour), and
- V = bathroom volume (9.00 m^3).

The term C_a is also called the Inhalation Concentration or IC. For carcinogenic COCs the IC is averaged over a 70-year lifespan yielding the Adjusted Inhalation Concentration (AIC). The AIC is calculated using the equation:

$$AIC = \frac{[C_a \times D \times EF \times ED]}{AT} \quad (9)$$

where

- C_a = constituent concentration in air ($\mu\text{g}/\text{m}^3$),
- D = duration of shower exposure (0.2 hr/day),
- EF = exposure frequency (350 days/yr),
- ED = exposure duration (30 yrs), and
- AT = averaging time (70 years times 24 hrs/day times 365 days/yr).

Inhalation exposure can also occur as a result of inhalation of dust particles upon which the COCs are adsorbed. Calculating the EPC for this route of exposure requires not only the concentration of the COC in the soil but also the concentration of soil particulates in the air. The EPC for this route of exposure is calculated using the equation:

$$C_i = C_s \times D \times RF \times PP \quad (10)$$

where

- C_i = inhaled concentration of COC ($\mu\text{g}/\text{m}^3$),
- C_s = COC concentration in the soil (mg/kg),
- R = the respirable fraction of the particulates, default is 0.73 (73 percent),
- PP = proportion of the particulates that is contaminated, default is 1.0 (100 percent),
- D = the particulate concentration in the air ($\mu\text{g}/\text{m}^3$), and
- CF = conversion factor (10^{-6} kilograms per milligram [kg/mg]).

The final step in the risk assessment process is to estimate the carcinogenic and non-carcinogenic risks for each COC. Carcinogenic risks for both soil and water ingestion are estimated by multiplying the LADDs of the COCs by a chemical-specific Cancer Slope Factor (CSF). A CSF is a toxicity value based upon the

relationship between the dosage of a chemical received the probability of a carcinogenic response. CSFs are derived by the USEPA Carcinogenic Assessment Group (CAG) for use in human health assessment and are obtained from the USEPA Integrated Risk Information System (IRIS), as are other USEPA toxicity factors.

The upper bound carcinogenic risk due to ingestion of a COC is calculated using the equation:

$$Risk = CSF \times LADD \quad (11)$$

where

- Risk - the probability of developing a carcinogenic response above the background rate (unitless),
- CSF - the Oral Cancer Slope Factor in $(\text{mg}/\text{kg}/\text{day})^{-1}$, and
- LADD - the Lifetime Average Daily Dose $(\text{mg}/\text{kg}/\text{day})$.

For inhalation exposures, USEPA guidance is to evaluate risks on the basis of contaminant concentrations in air (USEPA, 1989c). This requires the use of another toxicity value called the inhalation Unit Risk factor. The Unit Risk, much like the CSF, is an estimate of the relationship between the inhaled concentration of a COC that a person is exposed to and the probability of a carcinogenic response during the lifetime of that individual. The upper bound carcinogenic risk due to inhalation of COCs is calculated using the equation:

$$Risk = \text{Unit Risk} \times AIC \quad (12)$$

where

- Risk - the probability of developing a carcinogenic response (unitless), above the background rate,
- Unit Risk - the inhalation Unit Risk factor $(\mu\text{g}/\text{m}^3)^{-1}$, and
- AIC - the Adjusted Daily Inhalation Concentration $(\mu\text{g}/\text{m}^3)$.

When estimating risks associated with ingestion of non-carcinogenic COCs, the USEPA guidance is to compare the ADD to the chronic oral Reference Dose (RfD) for that COC. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude or more) of a daily intake for the human population, including sensitive sub-populations, that is likely to be without an appreciable risk of deleterious effects during a lifetime. The result of this comparison, called the Hazard Index (HI), is calculated in the equation:

$$HI = \frac{ADD}{RfD} \quad (13)$$

where

- HI - Hazard Index (unitless),
- ADD - Average Daily Dose $(\text{mg}/\text{kg}/\text{day})$, and
- RfD - chronic oral Reference Dose $(\text{mg}/\text{kg}/\text{day})$.

When estimating the risks associated with inhalation of non-carcinogenic COCs, the USEPA guidance is to compare the IC an to the inhalation correlate of the Reference Dose, the Reference Concentration (RfC). The result of this comparison, also called the HI, is calculated in the equation:

$$HI = \frac{IC}{RfC} \quad (14)$$

where

- HI - Hazard Index (unitless),
- IC - Average Inhalation Concentration (mg/m³), and
- RfC - chronic oral Reference Concentration (mg/m³).

HI less than 1.0 generally represent acceptable risks for non-carcinogenic toxic effects. HIs greater than 1 may be indicative of a possible non-carcinogenic toxic effect but the circumstances must be evaluated on a case-by-case basis.

When evaluating the risk of chronic, non-carcinogenic health effects from inhalation exposure, contaminant concentrations are compared to RfCs that correspond to continuous exposure. For exposures, such as showering, which occur for relatively short durations (0.2 hour), comparing exposure concentrations to RfCs may significantly overestimate risks.

The format for the human HEA is the same for each SWMU. A brief narrative of each SWMU site is followed by a description of the sampling conducted at the site. The chemicals detected in soil, groundwater, and surface water are presented in tables along with chemical concentrations detected in local area "background" locations. They are also compared to the two screening criteria. Comparing the concentration of detected chemicals to background levels and the two screening criteria aids in determining if the chemicals are at concentrations sufficient to pose a threat to human health. The human health risks associated with exposure to these COCs are then analyzed and discussed.

The oral cancer slope factors, inhalation unit risks, reference doses, and reference concentrations for all of the chemicals of concern (COCs) identified at SWMUs 2, 3, 4, 5, 13, and 22 of NAVSTA Mayport, are provided in Table 5-1.

5.1.1 Human Health Effects Assessment for SWMU 2 SWMU 2 is located at the current ordnance storage area, north of the eastern dredge spoils area. The landfill was operated from 1960 to 1964 as a trench and fill operation, and from 1979 to 1980 as a surface disposal area. SWMU 2 is approximately two acres in size. Trenches (15 feet wide, 300 feet long and 8 feet deep) were constructed by a dragline in incremental stages. The trenches intersected the water table, and waste was deposited into the standing water. Combustible material lying above water was burnt daily. Wastes disposed of at SWMU 2 included: sanitary wastes, oils, asbestos, paints, toluene, mercury lamps, hydraulic fluids, solvents, sulfuric acid, transformer oil, plating solutions, batteries, pesticide cans, photographic wastes, as well as other materials. The landfill was temporarily closed in 1964. The IAS estimated that 54,000 gallons of liquid waste had been disposed at the site.

**Table 5-1
Toxicity Data for Chemicals of Concern**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Oral CSF (mg/kg/day) ⁻¹	Unit Risk Factor ($\mu\text{g}/\text{m}^3$) ⁻¹	Oral Chronic RfD (mg/kg/day)	Inhalation RfC (mg/m ³)
Metals				
Arsenic	1.75	-	3x10 ⁻⁴	-
Cyanide	-	-	2x10 ⁻²	-
Volatile Organic Chemicals				
Benzene	2.9x10 ⁻²	8.3x10 ⁻⁶	-	-
1,4-Dichlorobenzene	2.4x10 ⁻²	-	-	7.0x10 ⁻¹
Polychlorinated Biphenyls (PCBs)				
Aroclor 1260	7.7	-	-	-
<p>Notes: (mg/kg/day)⁻¹ = per milligram per kilogram per day. ($\mu\text{g}/\text{m}^3$)⁻¹ = per microgram per cubic meter. mg/m³ = milligrams per cubic meter. mg/kg/day = milligram per kilogram per day. RfD = Reference Dose. RfC = Reference Concentration. CSF = cancer slope factor.</p>				

The site was used as an area landfill between 1979 to 1980. Items were deposited on the surface of the old fill. After 1980, the area was graded, covered with approximately three feet of soil, and paved with asphalt. SWMU 2 is now used as an ordnance storage yard for non-explosive material and equipment. A steel maintenance building and other minor support structures are constructed on the site. The entire area is enclosed with an eight-foot chain-linked fence with a locking gate.

SWMU 2 Soil Samples. Because of the asphalt cap on the majority of SWMU 2, the USEPA-approved RFI Workplan did not include collection and chemical analysis of either surface or subsurface soils samples except in the area known to be contaminated with PCB-containing transformer oils. This area was subjected to intensive sampling. A total of thirty-eight soil samples were collected and analyzed for PCBs using USEPA method 8080.

PCBs, as Aroclor 1260, were detected in all soil samples taken at SWMU 2. The PCB levels detected at SWMU 2 were compared to the two screening criteria values for PCBs. An SCV is defined as the concentration of a soil contaminant that correlates with either a 1×10^{-6} excess cancer risk or an Hazard Index of 1.0 using soil ingestion as the relevant exposure pathway. They do not consider chemical exposure via inhalation of vapors released from the soil or inhalation of soil particulates to which chemicals are adsorbed.

The range of PCBs detected in the soil at SWMU 2 are provided in Table 5-2. These levels are also compared with the two screening criteria in this table.

**Table 5-2
Chemicals Detected in the Soil at SWMU 2**

Phase 1 RCRA Facility Investigation NAVSTA Mayport Mayport, Florida					
Chemical	Range of Detected Concentration (mg/kg)	Frequency of Detections	1×10^{-6} or HI = 1 Screening Concentration (mg/kg)	RCRA Residential Soil Screening Level (mg/kg)	Chemical of Concern
Polychlorinated Biphenyls (PCBs)					
Aroclor 1260	0.007 - 120	38/38	0.22	0.090	Yes

Notes: mg/kg = milligrams per kilogram.
RCRA = Resource Conservation and Recovery Act.

Risk Assessment of Soil Exposure at SWMU 2. The risks associated with ingestion of the PCB-containing soils at SWMU 2 have been analyzed. The current USEPA guidance (1991b) is to evaluate the carcinogenic and non-carcinogenic risks due to soil exposure differently.

The carcinogenic risks due to soil exposure are analyzed for a resident living at the same location from birth to age 30. This 30-year exposure includes the first 6 years of life during which the child thought to ingest 200 mg of soil per day as well as the subsequent 24 years during which the person ingests 100 mg of soil per day.

The exposure point concentration used in the risk calculations are provided in Table 5-3. Also provided are the Lifetime Adjusted Daily Doses (LADD) used in the carcinogenic analysis for both the 6-year-old child and the 30-year-old adult.

Table 5-3
Exposure Point Concentrations and Dose Values for a
Child, Adult, and 30 Year Resident Exposed to the
Polychlorinated Biphenyls in Surface Soil at SWMU 2

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Chemical	Exposure Point Concentration (mg/kg)	Lifetime Average Daily Dose (mg/kg/day)
Child (0 to 6 years)		
Polychlorinated biphenyls	120	1.3×10^{-4}
Adult (7 to 30 years)		
Polychlorinated biphenyls	120	5.6×10^{-5}
30-Year Resident		
Polychlorinated biphenyls	120	1.9×10^{-4}

Notes: mg/kg = milligrams per kilogram.
 mg/kg/day = milligrams per kilogram per day.

The carcinogenic risk associated with soil exposure at SWMU 2 are provided in Table 5-4. The total upper bound carcinogenic risk associated with soil ingestion of the PCB-contaminated soil at SWMU 2 is 1×10^{-3} . This is significantly higher than the target risk generally considered acceptable by the USEPA, 1×10^{-6} . This risk assessment does not consider risks due to dermal contact or particulate inhalation since toxicity factors are not currently available for the COCs identified at SWMUs 2, 3, 4, 5, 13, and 22.

No non-carcinogenic toxicity values are available to calculate Hazard Indices for ingestion of PCB-contaminated soil at SWMU 2. Therefore, no Hazard Indices can be calculated for this exposure route.

SWMU 2 Groundwater Samples. Five groundwater samples were collected from monitoring wells previously installed at SWMU 2. The chemicals identified in these groundwater samples are provided in Table 5-5. These contaminant levels are compared with the chemical concentrations found in two groundwater wells, S-1 and MPT-1-1, considered to be indicative of background conditions at NAVSTA, Mayport and the two screening criteria. These screening criteria are either the Maximum Contaminant Limit (MCL), if one exists for the chemical, or the contaminant concentration in water that correlates with a 1×10^{-6} excess cancer

Table 5-4 Upper Bound Excess Cancer Risk Estimates for a 30 Year Resident Exposed to the Chemicals of Concern in Surface Soil at SWMU 2			
Phase 1 RCRA Facility Investigation NAVSTA Mayport Mayport, Florida			
Chemical	Weight of Evidence Class	Exposure Route	Chemical-specific Risk/Total Risk
		Soil Ingestion	
Polychlorinated biphenyls	B2	1x10 ⁻³	1x10 ⁻²
Notes: SWMU = Solid Waste Management Unit. Weight of Evidence Class = weight of evidence for human carcinogenicity. B2 = Probable Human Carcinogen, limited or no human data			

Table 5-5 Chemicals Detected in Groundwater at SWMU 2						
Phase 1 RCRA Facility Investigation NAVSTA Mayport Mayport, Florida						
Chemical	Range of Detected Concentration (µg/l)	Frequency of Detection	Maximum Background Concentration (µg/l)	1x10 ⁻⁶ or HI=1 Screening Concentration (µg/l)	RCRA Screening Level (µg/l)	Chemical of Concern
Metals						
Arsenic	5.0 - 19.0	2/5	14.3	0.049	¹ 50	Yes
Barium	8.7 - 34.0	5/5	0.82	2,600	¹ 1,000	No
Chromium	3.2	1/5	ND	180	¹ 50	No
Cyanide	2.2 - 306	3/5	ND	730	¹ 200	Yes
Lead	4.8 - 8.8	2/5	2.5	NI	¹ 50	No
Nickel	8	1/5	ND	1,600	700	No
Tin	22	1/5	ND	22,000	21,000	No
Vanadium	3.2 - 8	5/5	9.4	260	245	No
Zinc	4.1 - 4.3	3/5	10.2	7,300	7,000	No
Volatile Organic Chemicals						
2-Butanone	9	1/5	ND	1,800	2,000	No
Semivolatile Organic Chemicals						
Carbon disulfide	1 - 2	2/5	1	21	4,000	No
¹ Federal Maximum Contaminant Limit (MCL). Notes: ND = not detected. µg/l = micrograms per liter. RCRA = Resource Conservation and Recovery Act.						

risk or a Hazard Index of 1.0 using ingestion of the water as the relevant exposure pathway. They do not consider the toxicity associated with inhalation of vapors released from the water during showering or other potable water uses.

Based upon these comparisons, two COCs are identified in the groundwater at SWMU 2, arsenic and cyanide. A number of other chemicals were also detected in the groundwater and surface water samples. These chemicals were aluminum, calcium, iron, magnesium, potassium, and sodium. However, these metals are considered essential nutrients and are associated with low toxicities at the concentrations detected. Therefore, these chemicals were not considered as possible chemicals of concern for either the groundwater or surface water.

Exposure Concentrations for Groundwater Use at SWMU 2. The exposure point concentrations used to estimate the risks associated with ingestion of the groundwater at SWMU 2 are provided in Table 5-6. Also provided are the Lifetime Average Daily Doses (LADD) used for calculating the carcinogenic risks associated with the groundwater use as well as the Average Daily Doses (ADD) used for calculating non-carcinogenic risks.

**Table 5-6
Exposure Point Concentrations and Dose Values of Chemicals of
Concern in Groundwater at SWMU 2**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Exposure Point Concentration ($\mu\text{g}/\ell$)	Average Daily Dose (mg/kg/day)	Lifetime Average Daily Dose (mg/kg/day)
Metals			
Arsenic	19.1	5.2×10^{-4}	2.2×10^{-4}
Cyanide	306	2.0×10^{-2}	

Notes: SWMU = Solid Waste Management Unit.
 $\mu\text{g}/\ell$ = micrograms per liter.
 mg/kg/day = milligrams per kilogram per day.

Risk Assessment of Groundwater Use at SWMU 2. The risks calculated for use of the groundwater at SWMU 2 as a drinking water source are provided in Table 5-7. The total upper bound risk due to ingestion of the groundwater at SWMU 2 is 3.9×10^{-5} which is due arsenic. This risk is greater than the risks generally considered acceptable by the USEPA, 1×10^{-6} .

The non-carcinogenic HIs due to ingestion of the groundwater at SWMU 2 are provided in Table 5-8. The HI associated with arsenic ingestion is 2 suggesting that there may be an unacceptable non-carcinogenic health risk associated with ingestion of the groundwater at SWMU 2. The HI for cyanide was 0.4 which indicates that adverse health risks associated with exposure to cyanide are not expected.

Table 5-7
Upper Bound Excess Cancer Risk Estimates
Associated with Exposure to Groundwater at SWMU 2

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Weight of Evidence Class	Exposure Route	Chemical-specific Risk/ Total Risk
		Ingestion	
Metals			
Arsenic	A	3.9×10^{-6}	3.9×10^{-6}
<p>¹Risk estimate adjusted down one order of magnitude to reflect limited likelihood of inducing lethal cancer (USEPA, 1987). See text for further information.</p> <p>Notes: SWMU = Solid Waste Management Unit. Weight of Evidence Class = Weight of evidence for human carcinogenicity. A = Known human carcinogen.</p>			

Table 5-8
Hazard Indices Associated with Exposures
to Groundwater at SWMU 2

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemicals	Ingestion	Chemical-Specific HQ/Hazard Index
Metals		
Arsenic	2	2
Cyanide	4×10^{-1}	4×10^{-1}
Total HQ	2.4	2.4
<p>Notes: SWMU = Solid Waste Management Unit. HQ = Hazard Quotient. HI = Hazard Index.</p>		

Discussion. The groundwater at SWMU 2 is very unlikely to be used as a potable water source. Although the surficial aquifer may be technically classified G-II, salinity is indicated by exceedances of secondary standards as described in FAC Chapter 17.550.320 in most of the surficial wells for total dissolved solids (TDS), chloride and sulfate. Based on these parameters alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely. In addition, a number of samples from groundwater wells also exceeded Florida secondary water standards for alkalinity, sulfide, sulfate, water hardness, and ammonia. Also, if wells were placed and pumped as a regular water supply, salinity might be expected to increase due to saltwater intrusion into the aquifer. Therefore, the groundwater is unsuitable for use as a potable water supply and there is little likelihood that the water could be used for either agricultural or industrial purposes.

If the groundwater were to be used for as a potable water source, however, significant health risks could result. Carcinogenic risks associated with ingestion of the water would be 3.9×10^{-5} due to the presence of arsenic. There may also be unacceptable non-carcinogenic risks associated with ingestion of this water. Again, this is primarily due to the presence of arsenic in the water with some contribution by cyanide.

The risk estimates for arsenic in this document have been adjusted down one order of magnitude based upon the following considerations. Although arsenic is clearly a USEPA class A carcinogen by both ingestion and inhalation exposure routes, the carcinogenic response which has been confirmed in studies of humans exposed to arsenic by ingestion has been an increase in the incidence of skin cancers. It has also been estimated that only a small percentage, approximately 1%, of all skin tumors, including arsenic-induced tumors, result in mortality. In addition, the USEPA analysis of the dose-response relationship for humans exposed to arsenic in drinking water suggests that the shape of the curve is non-linear at low exposure levels.

There is some evidence that arsenic exposure may be related to other carcinogenic effects such as liver, bladder, kidney and lung cancers but the data is inconsistent and the USEPA has not altered its CSF. It should also be noted, however, that no carcinogenic response has been noted in animal carcinogenicity assays of arsenic and there is some evidence in animals that arsenic may, in fact, be an essential nutrient. Reducing arsenic ingestion below a certain level may then decrease calculated carcinogenic risks at the expense of possible beneficial nutritive effects of this element.

Therefore, the approach followed in this document is to adjust the upper bound carcinogenic risk estimated for arsenic ingestion by one order of magnitude. While this approach could be considered a risk management rather than a risk assessment decision, ABB-ES believes that this is a scientifically defensible risk adjustment that is in agreement with USEPA risk assessment policy (USEPA, 1987).

There is insufficient information available to determine if the presence of arsenic is due to contamination leaking from SWMU 2 or if it is due to natural sources. Arsenic was found in the background groundwater wells at $14.3 \mu\text{g}/\text{l}$ suggesting that the arsenic may be natural. It is also interesting to note that the cancer risks associated with arsenic at this level is 3×10^{-4} . Therefore some

level of carcinogenic risk would have to be acceptable if the groundwater at NAVSTA Mayport were to be used as a potable water source.

In addition there is clearly a human health risk associated with soil ingestion at SWMU 2, specifically due to the presence of PCBs. However, this area is quite small and can be considered a "hotspot." The horizontal and vertical extent of this PCB "hotspot" needs to be fully delineated for possible remediation actions.

5.1.2 Human Health Effects Assessment for SWMU 3 SWMU 3 was a former landfill that operated from 1963 to 1965. The site is located southwest of SWMU 2 and extends to the northwestern corner of the eastern dredge spoil area. SWMU 3 occupies approximately 3 acres and consists of several pits (eight are estimated) constructed by dragline. Each pit was approximately 40 feet wide, 40 feet long and 8 feet deep, and intersected the water table. Items were disposed of into standing water in the pits. Wastes known to be disposed of at SWMU 3 included waste oil, mercury, solvents, asbestos, acids, pesticide containers, sanitary wastes, and construction rubble.

SWMU 3 Soil Sample. One subsurface soil sample was collected during the construction of monitoring well MPT-2-MW16S. This monitoring well is located at the junction of SWMU 3 and SWMU 4 and the analytical results of this soil sample are used in characterizing both SWMU 3 and SWMU 4. The analytical results of this soil sample along with a comparison of these results with the two screening criteria are provided in Table 5-9. No COCs were identified in the single soil sample collected at SWMU 3.

Groundwater Sampling at SWMU 3. Groundwater samples were collected from four monitoring wells at SWMU 3. The analytical results of these four water samples are provided in Table 5-10. Also provided in this table are the analytical results of the background groundwater wells and the two screening criteria for comparison. After comparison of the analytical results with the background results and the two screening values, no COCs were identified in the groundwater at SWMU 3.

Surface Water Sampling at SWMU 3. One surface water sample was collected from the drainage system at SWMU 3. The results of the chemical analysis of this water sample along with the results of the background surface water samples and the two screening criteria are provided in Table 5-11. Based upon a comparison with background results and the two screening criteria, only arsenic was identified as a COC in the surface water at SWMU 3.

Exposure Concentrations for Surface Water Use at SWMU 3. The exposure route examined for the surface water at SWMU 3 was ingestion. The exposure point concentration used for the analysis of this exposure is provided in Table 5-12. Also provided is the Lifetime Average Daily Dose (LADD) used for calculating carcinogenic risks and the Average Daily Dose (ADD) used for calculating the non-carcinogenic risks associated with ingestion of the surface water at SWMU 3.

Risk Assessment of Surface Water Use at SWMU 3. The risks have been calculated for use of the surface water at SWMU 13 as drinking water source are provided in Table 5-13. The total upper bound risk associated with ingestion of this water is 4.9×10^{-6} which is greater than the target risk normally considered acceptable by the USEPA, 1×10^{-6} .

**Table 5-9
Chemicals Detected in the Soil at SWMU 3**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration (mg/kg)	Frequency of Detections	1x10 ⁻⁶ or HI = 1 Screening Concentration (mg/kg)	RCRA Residential Soil Screening Level (mg/kg)	Chemical of Concern
Metals					
Arsenic	0.22	1/1	0.97	80	No
Barium	4.4	1/1	5,500	4,000	No
Chromium	3.1	1/1	390	400	No
Copper	2.8	1/1	2,900	2,960	No
Lead	10.6	1/1	NI	NI	No
Nickel	3.1	1/1	1,600	2,000	No
Zinc	50.9	1/1	16,000	16,000	No
Volatile Organic Compounds					
Xylene (total)	2	1/1	20,000	160,000	No
Pesticides					
4,4'-DDD	0.0018	1/1	3	7.1	No
4,4'-DDT	0.0009	1/1	2	5	No
Notes: NI = no information from the USEPA. mg/kg = milligrams per kilogram. RCRA = Resource Conservation and Recovery Act.					

**Table 5-10
Chemicals Detected in Groundwater at SWMU 3**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration ($\mu\text{g}/\ell$)	Frequency of Detection	Maximum Background Concentration ($\mu\text{g}/\ell$)	1×10^{-6} or HI=1 Screening Concentration ($\mu\text{g}/\ell$)	RCRA Screening Level ($\mu\text{g}/\ell$)	Chemical of Concern
Metals						
Barium	12.8 - 62.4	4/4	0.82	2,600	¹ 1,000	No
Copper	3.3	1/4	1.4	1,400	¹ 1,300	No
Cyanide	2.2 - 7.2	2/4	ND	730	¹ 200	No
Lead	0.8 - 3.6	2/4	2.5	NI	¹ 50	No
Nickel	8.6 - 11.6	2/4	ND	1,600	700	No
Vanadium	3.2 - 57	3/4	9.4	260	245	No
Zinc	4.6 - 77.2	3/4	10.2	7,300	7,000	No
Semivolatile Organic Chemicals						
2,4 Dimethyl phenol	13	1/4	ND	730	700	No
¹ Federal Maximum Contaminant Limit (MCL).						
Notes: ND = not detected. $\mu\text{g}/\ell$ = micrograms per liter. RCRA = Resource Conservation and Recovery Act.						

**Table 5-11
Chemicals Detected in Surface Water at SWMU 3**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration ($\mu\text{g}/\ell$)	Frequency of Detection	Maximum Background Concentration ($\mu\text{g}/\ell$)	1×10^{-6} or HI = 1.0 Screening Concentration ($\mu\text{g}/\ell$)	RCRA Screening Level ($\mu\text{g}/\ell$)	Chemical of Concern
Metals						
Arsenic	2.4	1/1	1.4	0.049	150	Yes
Barium	21.8	1/1	15.4	2,600	1,000	No
Copper	6.25	1/1	37.2	1,400	1,300	No
Cyanide	5.0	1/1	3	730	1,200	No
Lead	3.3	1/1	1.5	NI	150	No
Selenium	4.6	1/1	2.6	180	150	No
Zinc	30.1	1/1	ND	7,300	7,000	No

¹ Federal Maximum Contaminant Limit (MCL).

Notes: ND = not detected.
NI = no information available from the USEPA
 $\mu\text{g}/\ell$ = micrograms per liter.
RCRA = Resource Conservation and Recovery Act.

**Table 5-12
Exposure Point Concentrations and Dose Values of Chemicals of Concern in Surface Water at SWMU 3**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Exposure Point Concentration ($\mu\text{g}/\ell$)	Average Daily Dose (mg/kg/day)	Lifetime Average Daily Dose (mg/kg/day)
Metals			
Arsenic	2.4	6.6×10^{-6}	2.8×10^{-6}

Notes: SWMU = Solid Waste Management Unit.
 $\mu\text{g}/\ell$ = micrograms per liter.
mg/kg/day = milligrams per kilogram per day.

Table 5-13
Upper Bound Excess Cancer Risk Estimates
Associated with Exposure to Surface Water at SWMU 3

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Chemical	Weight of Evidence Class	Exposure Route	Chemical-specific Risk/ Total Risk
		Ingestion	
Metals			
Arsenic	A	¹ 4.9x10 ⁻⁶	¹ 4.9x10 ⁻⁶

¹Risk estimate adjusted down one order of magnitude to reflect limited likelihood of inducing lethal cancer (USEPA, 1987). See text for further information.

Notes: SWMU = Solid Waste Management Unit.
 Weight of Evidence Class = Weight of evidence for human carcinogenicity.
 A = Known human carcinogen.

The non-carcinogenic HIs associated with surface water use as a drinking water source at SWMU 3 are provided in Table 5-14. The HI for ingestion of arsenic in drinking water is 0.2 which indicates that no adverse health effects should be expected from ingestion of the surface water at SWMU 3.

Table 5-14
Hazard Indices Associated with Exposures
to Groundwater at SWMU 3

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Chemicals	Ingestion	Chemical-Specific HQ/Hazard Index
Metals		
Arsenic	0.2	0.2
Total HQ	0.2	0.2

Notes: SWMU = Solid Waste Management Unit.
 HQ = Hazard Quotient.
 HI = Hazard Index.

Discussion. The only unacceptable health risk noted at SWMU 3 was that of using the surface water as a source of drinking water. However, it is highly unlikely that this water would be used as a potable water source. TDS in the surface water at SWMU 3 ranged from 12,000 to 12,400 mg/l with moderate salinity. Other general water quality parameters such as alkalinity and hardness indicate that the surface water at SWMU 3 is affected by the estuarine influences of Sherman Creek, Pablo Creek, and Chicopit Bay. Therefore, the general quality of the

water would greatly reduce the likelihood of this water being used as a potable water source.

There is insufficient information available to determine if the presence of arsenic is due to contamination leaking from SWMU 3 or if it is due to natural sources. Arsenic was found in background surface water samples at 1.4 $\mu\text{g}/\ell$ compared to 2.4 $\mu\text{g}/\ell$ in the surface water sample. This suggests that the arsenic may be due to natural background rather than contamination from SWMU 3.

5.1.3 Human Health Effects Assessment for SWMU 4 SWMU 4 is located west of SWMUs 2, 3, and 5, and northeast of the western dredge spoils area. SWMU 4 is divided into two sections by a drainage ditch and covers approximately 11 acres. The landfill was managed as a trench and fill operation from 1963 to 1966. The landfill consisted of approximately 12 trenches excavated by dragline to about 15-feet wide by 300-feet long by 8-feet deep. The trenches were excavated in incremental stages. Construction debris was placed on the old fill area between 1974 to 1980.

The trenches intersected the water table and wastes were deposited into the standing water. Combustible materials above water were burnt daily. Wastes included: sanitary wastes, oils, asbestos, paints, toluene, mercury lamps, hydraulic fluids, solvents, sulfuric acid, transformer oil, plating solutions, batteries, pesticide cans, photographic wastes, as well as other materials. The IAS estimated that a total of 54,000 gallons per year of liquid wastes were disposed at SWMU 4 during its operations, and that at least 97,000 gallons were left at closure. The landfill was graded and covered with topsoil when closed. A small portion of the northern part of the site near the ordnance access road has been graded with a thin bed of road base and is being used as a temporary storage area for transportation and construction vehicles.

SWMU 4 Soil Samples. Two soil samples were collected at SWMU 4. As noted above, one sample was a subsurface soil sample collected during the construction of monitoring well MPT-2-MW16S. The other sample was collected from the southern most portion of SWMU 4. The analytical results of these two soil samples are provided in Table 5-15. After comparing the chemicals detected in this soil sample with the two screening criteria, no COCs were identified in the soil at SWMU 4.

Groundwater Sampling at SWMU 4. Six groundwater samples were collected at SWMU 4, one from each of the existing or new monitoring wells. A comparison of the analytical results of these water samples with maximum background concentrations and the two screening criteria are provided in Table 5-16. These comparisons indicates that there are three COCs in the groundwater at SWMU 4. They are arsenic and two volatile organic chemicals, benzene and 1,4-dichlorobenzene.

Exposure Concentrations for Groundwater Use at SWMU 4. Two exposure scenarios to the groundwater at SWMU 4 have been examined. These are direct use of the groundwater as a source of drinking water and exposure to the volatile organic chemicals in the groundwater during use of this water for showering. The exposure point concentrations of the three COCs identified in the groundwater at SWMU 4 are provided in Table 5-17. Also provided in Table 5-17 are the Lifetime Adjusted Daily Doses (LADD) and the Adjusted Daily Inhalation Concentration (AIC) used to calculate carcinogenic risks as well as the Adjusted Daily Doses (ADD)

**Table 5-15
Chemicals Detected in the Soil at SWMU 4**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration (mg/kg)	Frequency of Detections	1x10 ⁻⁶ or HI = 1 Screening Concentration (mg/kg)	RCRA Residential Soil Screening Level (mg/kg)	Chemical of Concern
Metals					
Arsenic	0.22 - 0.86	2/2	0.97	80	No
Barium	4.4 - 5.3	2/2	5,500	4,000	No
Chromium	3.1 - 4.3	2/2	390	400	No
Copper	0.69 - 2.8	2/2	2,900	2,960	No
Lead	10.6	1/2	NI	NI	No
Nickel	3.1	1/2	1,600	2,000	No
Zinc	50.9	1/2	16,000	16,000	No
Volatile Organic Compounds					
Xylene (total)	¹ 2	2/2	20,000	160,000	No
Pesticides					
4,4'-DDD	0.0018	1/2	3	7.1	No
4,4'-DDT	0.0009	1/2	2	5	No

¹Both samples at this same concentration.

Notes: mg/kg = milligrams per kilogram.
RCRA = Resource Conservation and Recovery Act.
NI = no information from the USEPA.

**Table 5-16
Chemicals Detected in Groundwater at SWMU 4**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration ($\mu\text{g}/\ell$)	Frequency of Detection	Maximum Background Concentration ($\mu\text{g}/\ell$)	1×10^{-6} or HI=1 Screening Concentration ($\mu\text{g}/\ell$)	RCRA Screening Level ($\mu\text{g}/\ell$)	Chemical of Concern
Metals						
Arsenic	3.5 - 23	5/6	14.3	0.049	¹ 50	Yes
Barium	10.3 - 82.7	6/6	0.82	2,600	¹ 1,000	No
Cyanide	3.7 - 10.9	5/6	ND	730	¹ 200	No
Lead	5.0	1/6	2.5	NI	¹ 50	No
Nickel	6.5 - 11.3	3/6	ND	1,600	700	No
Vanadium	6 - 12.1	6/6	9.4	260	245	No
Zinc	2.7 - 11.5	5/6	10.2	7,300	7,000	No
Volatile Organic Chemicals						
Benzene	2	1/6	ND	0.49	² 1	Yes
Chlorobenzene	10 - 13	2/6	ND	39	700	No
1,4 Dichlorobenzene	2 - 3	2/6	ND	0.59	¹ 75	Yes
Semivolatile Organic Chemicals						
Di-n-butyl phthalate	3	1/6	ND	3,700	8,000	No
Carbon disulfide	1 - 10	3/6	1	21	4,000	No
¹ Federal Maximum Contaminant Limit (MCL). ² Florida Maximum Contaminant Limit (MCL), which is lower than the Federal MCL. Notes: $\mu\text{g}/\ell$ = micrograms per liter. RCRA = Resource Conservation and Recovery Act. ND = not detected. NI = no information from the USEPA.						

Table 5-17
Exposure Point Concentrations and Dose Values of Chemicals of Concern
in Groundwater at SWMU 4

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Chemical	Exposure Point Concentration ($\mu\text{g}/\text{l}$)	Average Daily Dose ($\text{mg}/\text{kg}/\text{day}$)	Inhalation Concentration (mg/m^3)	Lifetime Average Daily Dose ($\text{mg}/\text{kg}/\text{day}$)	Adjusted Concentration ($\mu\text{g}/\text{m}^3$)
Metals					
Arsenic	2.3	6.3×10^{-4}	-	2.7×10^{-4}	-
Volatile Organic Chemicals					
Benzene	2	5.5×10^{-5}	6.1	2.3×10^{-5}	6.1×10^{-1}
1,4-Dichlorobenzene	3	8.2×10^{-5}	3.0×10^{-2}	3.5×10^{-5}	1.1×10^{-1}
Notes: SWMU = Solid Waste Management Unit. $\mu\text{g}/\text{l}$ = micrograms per liter. $\text{mg}/\text{kg}/\text{day}$ = milligrams per kilogram per day. mg/m^3 = milligrams per cubic meter. $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter.					

and the Inhalation Concentrations (IC) used to calculate the non-carcinogenic risks.

Risk Assessment of Groundwater Use at SWMU 4. The carcinogenic risks associated with potable use of the groundwater at SWMU 4 are provided in Table 5-18. The total upper bound cancer risk associated with ingestion and inhalation of vapors from the groundwater at SWMU 4 is 4.9×10^{-5} . The majority of this risk is related to ingestion of the water. The inhalation risk is only 6×10^{-7} which is due to benzene. Arsenic is the principal source of cancer risk at 4.7×10^{-5} with benzene and 1,4-dichlorobenzene contributing approximately equal risks at 7×10^{-7} and 8×10^{-7} , respectively.

Table 5-18 Upper Bound Excess Cancer Risk Estimates Associated with Exposure to Groundwater at SWMU 4				
Phase 1 RCRA Facility Investigation NAVSTA Mayport Mayport, Florida				
Chemical	Weight of Evidence Class	Exposure Route		Chemical-specific Risk/ Total Risk
		Ingestion	Inhalation of Vapors During Showering	
Metals				
Arsenic	A	4.7×10^{-5}	-	4.7×10^{-5}
Volatile Organic Chemicals				
Benzene	A	7×10^{-7}	6×10^{-7}	1.3×10^{-6}
1,4-Dichlorobenzene	C	8×10^{-7}	-	8×10^{-7}
Exposure Route-Specific Risk		4.8×10^{-5}	6×10^{-7}	4.9×10^{-5}
¹ Risk estimate adjusted down one order of magnitude to reflect limited likelihood of inducing lethal cancer (USEPA, 1987). See text for further information.				
Notes: SWMU = Solid Waste Management Unit. Weight of Evidence Class = Weight of evidence for human carcinogenicity. A = Known human carcinogen. C = Possible human carcinogen.				

The non-carcinogenic HIs associated with use of the groundwater at SWMU 4 are provided in Table 5-19. This analysis indicates that a non-carcinogenic toxic effect could result from arsenic ingestion if the groundwater were to be used as a drinking water source.

Discussion. Use of the groundwater at SWMU 4 would present an unacceptable carcinogenic risk due to the presence of arsenic and benzene. The major risk would be due to the presence of arsenic in the water but unacceptable levels of benzene might also be present if the water were to be used for purposes such as showering. However, it is highly unlikely that this groundwater would be used for potable purposes. The general water quality of the surficial aquifer SWMU

4 is characterized by saline conditions as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely or limited at best. As with other SWMUs at NAVSTA Mayport, secondary standards as described in FAC Chapter 17.550.320 are exceeded in most of the surficial wells for TDS, chloride, and sulfate.

Table 5-19 Hazard Indices Associated with Exposures to Groundwater at SWMU 4 Phase 1 RCRA Facility Investigation NAVSTA Mayport Mayport, Florida			
Chemical	Exposure Route		Chemical-specific HQ/ Hazard Index
	Ingestion	Inhalation of Vapors During Showering	
Metals			
Arsenic	2	-	2
Volatile Organic Chemicals			
Benzene	—	—	—
1,4-Dichlorobenzene	—	4x10 ⁻²	4x10 ⁻²
Exposure Route-Specific HQ		4x10 ⁻²	2.04
Notes: SWMU = Solid Waste Management Unit. HQ = Hazard Quotient. HI = Hazard Index.			

It is also unclear whether the three volatile organic chemicals detected in the groundwater at SWMU 4 are indicative of contamination at the site. This is especially true since the two chemicals were detected in only two of the six groundwater monitoring wells at SWMU 4 and that they were detected at concentrations near the sample detection limits for these chemicals. Therefore, confirmatory sampling of the groundwater at SWMU 4 is recommended to confirm the presence of these chemicals at SWMU 4.

Sampling of Surface Water at SWMU 4. Two surface water samples were collected at SWMU 4. The analytical results from these two surface water samples are compared with background and the two screening criteria in Table 5-20. This comparison indicates that only arsenic is a COC in the surface water at SWMU 4.

Exposure Concentrations for Surface Water Use at SWMU 4. The exposure route examined for the surface water at SWMU 4 is for use of the water as a drinking water source. The exposure point concentrations used for this risk analysis are provided in Table 5-21. Also provided are the Lifetime Adjusted Daily Doses (LADD) used for the carcinogenic risks and the Average Daily Doses (ADD) used for calculating non-carcinogenic risks.

Table 5-20
Chemicals Detected in Surface Water at SWMU 4

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration ($\mu\text{g}/\ell$)	Frequency of Detection	Maximum Background Concentration ($\mu\text{g}/\ell$)	1×10^{-6} or HI = 1.0 Screening Concentration ($\mu\text{g}/\ell$)	RCRA Screening Level ($\mu\text{g}/\ell$)	Chemical of Concern
Metals						
Arsenic	1.1 - 4.3	2/2	1.4	0.049	¹ 50	Yes
Barium	11.6 - 11.7	2/2	15.4	2,600	¹ 1,000	No
Copper	24.5	1/2	37.2	1,400	¹ 1,300	No
Cyanide	5.4	1/2	3	730	1,200	No
Lead	3.2	1/2	1.5	NI	¹ 50	No
Selenium	2.3	1/2	2.6	180	¹ 50	No
Vanadium	6.1	1/2	3.6	260	245	No
Zinc	5.4	1/2	ND	7,300	7,000	No

¹ Federal Maximum Contaminant Limit (MCL).

Notes: ND = not detected.

$\mu\text{g}/\ell$ = micrograms per liter.

RCRA = Resource Conservation and Recovery Act.

Table 5-21
Exposure Point Concentrations and Dose Values of Chemicals of Concern in Surface Water at SWMU 4

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Exposure Point Concentration ($\mu\text{g}/\ell$)	Average Daily Dose (mg/kg/day)	Lifetime Average Daily Dose (mg/kg/day)
Metals			
Arsenic	4.3	1.2×10^{-4}	5.0×10^{-5}

Notes: SWMU = Solid Waste Management Unit.

$\mu\text{g}/\ell$ = micrograms per liter.

mg/kg/day = milligrams per kilogram per day.

Risk Assessment of Surface Water Use at SWMU 4. The risks have been calculated for use of the surface water at SWMU 4 as drinking water source and are provided in Table 5-22. The total upper bound risk associated with ingestion of the groundwater is 8.7×10^{-6} due to exposure to arsenic.

Table 5-22
Upper Bound Excess Cancer Risk Estimates
Associated with Exposure to Surface Water at SWMU 4

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Chemical	Weight of Evidence Class	Exposure Route	Chemical-specific Risk/ Total Risk
		Ingestion	
Metals			
Arsenic	A	8.7×10^{-6}	8.7×10^{-6}

¹Risk estimate adjusted down one order of magnitude to reflect limited likelihood of inducing lethal cancer (USEPA, 1987). See text for further information.

Notes: SWMU = Solid Waste Management Unit.
 Weight of Evidence Class = Weight of evidence for human carcinogenicity.
 A = Known human carcinogen.

The non-carcinogenic HIs associated with surface water use as a drinking water source at SWMU 4 are provided in Table 5-23. The HI for ingestion of arsenic in drinking water is 0.4 which indicates that no adverse health effects should be expected from ingestion of this water.

Table 5-23
Hazard Indices Associated with Exposures
to Surface Water at SWMU 4

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Chemicals	Ingestion	Chemical-Specific HQ/Hazard Index
Metals		
Arsenic	0.4	0.4
Total HQ	0.4	0.4

Notes: SWMU = Solid Waste Management Unit.
 HQ = Hazard Quotient.
 HI = Hazard Index.

Discussion. The use of the surface water at SWMU 4 as a drinking water source would present an unacceptable health threat due to the presence of arsenic. However, it is highly unlikely that this water would be used for potable purposes. The groundwater in the surficial aquifer at SWMU 4 may be characterized as saline as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely or limited at best. Although the surficial aquifer may be technically classified G-II, secondary standards as described in FAC Chapter 17.550.320 are substantially exceeded in most of the surficial wells for TDS, chloride, and sulfate.

The general water quality parameters, such as TDS, alkalinity, and hardness, indicate that the surface water at SWMU 4 is affected by the estuarine influences of Sherman Creek, Pablo Creek, and Chicopit Bay. This observation is supported by visual indications. Therefore, the general quality of the water would keep it from being used as a potable water source.

There is insufficient information available to determine if the presence of arsenic is due to contamination leaking from SWMU 4 or if it is due to natural sources. Arsenic was found in the surface water samples, although at lower levels than at SWMU 4. However, even this level ($1.4 \mu\text{g}/\text{l}$) is associated with a cancer risk of 1×10^{-6} indicating that some level of carcinogenic risk would have to be acceptable if the surface water at SWMU 4 were to be used as a potable water source.

5.1.4 Human Health Effects Assessment for SWMU 5 SWMU 5 is located east of SWMUs 2, 3, 4, and northeast of the eastern dredge spoils area. The landfill, covering approximately 34 acres, was managed as trench & fill disposal operation from 1966 to 1985. Trenches excavated in incremental stages. The dimensions of the trenches were approximately 15-foot wide by 8-foot deep and several hundred-foot long. Construction debris was subsequently placed on top of the old trench and fill areas.

The trenches intersected the water table, and waste was deposited into the standing water. Wastes similar to those disposed of in the other landfills where managed at SWMU 5 and included: sanitary wastes, oils, asbestos, paints, toluene, mercury lamps, hydraulic fluids, solvents, sulfuric acid, transformer oil, plating solutions, batteries, pesticide cans, photographic wastes, as well as other materials. The IAS estimated that a total of 200,000 gallons of liquid wastes were disposed at SWMU 5 during its operations. The landfill was graded and covered with topsoil when closed. A portion of the site has been enclosed with chain-linked fence and is used as a long-term parking area for vehicles of navy personnel deployed at sea.

Soil Sampling at SWMU 5. Two soil samples were collected at SWMU 5. The analytical results of these two soil samples are provided in Table 5-24. A comparison of the analytical results of these two soil samples with the two screening criteria indicate that there are no COCs in the soil at SWMU 5.

Groundwater Sampling at SWMU 5. Six groundwater samples were collected from monitoring wells previously installed at SWMU 5. The analytical results of these six samples are provided in Table 5-25. A comparison of these results with background samples and the two screening criteria indicates that arsenic is a COC in the groundwater at SWMU 5.

**Table 5-24
Chemicals Detected in the Soil at SWMU 5**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration (mg/kg)	Frequency of Detections	1x10 ⁻⁶ or HI = 1 Screening Concentration (mg/kg)	RCRA Residential Soil Screening Level (mg/kg)	Chemical of Concern
Metals					
Arsenic	0.52 - 0.91	2/2	0.97	80	No
Barium	6.0 - 6.9	2/2	5,500	4,000	No
Chromium	2.7 - 3.4	2/2	390	400	No
Copper	1.1 - 3.9	2/2	2,900	2,960	No
Lead	2.6	1/2	NI	NI	No
Nickel	6.2	1/2	1,600	2,000	No
Selenium	0.38	1/2	390	400	No
Vanadium	4.1	1/2	550	560	No
Volatile Organic Compounds					
Xylenes (total)	¹ 2	2/2	160,000	20,000	No

¹Both samples at this same concentration.

Notes: NI = no information from the USEPA.
mg/kg = milligrams per kilogram.
RCRA = Resource Conservation and Recovery Act.

**Table 5-25
Chemicals Detected in Groundwater at SWMU 5**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration (µg/l)	Frequency of Detection	Maximum Back-ground Concentration (µg/l)	1x10 ⁶ or HI=1 Screening Concentration (µg/l)	RCRA Screening Level (µg/l)	Chemical of Concern
Metals						
Arsenic	2.2 - 138	5/6	14.3	0.049	¹ 50	Yes
Barium	12.7 - 42.1	6/6	0.82	2,600	¹ 1,000	No
Chromium	6.6 - 12.2	2/6	ND	180	¹ 50	No
Copper	7.4 - 11.4	2/6	1.4	1,400	¹ 1,300	No
Cyanide	8.6 - 35.1	3/6	ND	730	¹ 200	No
Lead	1.4 - 7.2	3/6	2.5	NI	¹ 50	No
Nickel	4.7 - 21.1	3/6	ND	1,600	700	No
Selenium	1.5 - 2.5	2/6	ND	180	¹ 50	No
Vanadium	6.7 - 24.0	6/6	9.4	260	245	No
Zinc	6.2 - 45.4	6/6	10.2	7,300	7,000	No
Volatile Organic Chemicals						
2-Butanone	13	1/6	ND	1,800	2,000	No
Toluene	16	1/6	ND	750	10,000	No
Xylene (total)	2	1/6	ND	12,000	70,000	No
Semivolatile Organic Chemicals						
Carbon disulfide	3 - 10	2/6	1	21	4,000	No
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	45.5	1/6	ND	2,200	2,100	No
Fluorene	3.5	1/6	ND	1,500	1,400	No
¹ Federal Maximum Contaminant Limit (MCL).						
Notes: ND = not detected.						
µg/l = micrograms per liter.						
RCRA = Resource Conservation and Recovery Act.						

Exposure Concentrations for Groundwater Use at SWMU 5. The exposure pathway examined in this analysis is ingestion of the groundwater. The COC exposure point concentrations used for this risk analysis are provided in Table 5-26. Also provided are the Lifetime Adjusted Daily Doses (LADD) used for calculating carcinogenic risks as well as the Average Daily Doses (ADD) used for calculating non-carcinogenic risks.

Table 5-26
Exposure Point Concentrations and Dose Values of Chemicals of
Concern in Groundwater at SWMU 5

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Chemical	Exposure Point Concentration ($\mu\text{g}/\text{l}$)	Average Daily Dose (mg/kg/day)	Lifetime Average Daily Dose (mg/kg/day)
Metals			
Arsenic	138	3.8×10^{-3}	1.6×10^{-4}

Notes: SWMU = Solid Waste Management Unit.
 $\mu\text{g}/\text{l}$ = micrograms per liter.
 mg/kg/day = milligrams per kilogram per day.

Risk Assessment of Groundwater Use at SWMU 5. The risks have been calculated for use of the surface water at SWMU 5 as drinking water source and are provided in Table 5-27. The total upper bound cancer risk associated with ingestion of the groundwater is 2.3×10^{-3} due to exposure to arsenic.

Table 5-27
Upper Bound Excess Cancer Risk Estimates
Associated with Exposure to Groundwater at SWMU 5

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Chemical	Weight of Evidence Class	Exposure Route	Chemical-specific Risk/ Total Risk
		Ingestion	
Metals			
Arsenic	A	2.8×10^{-3}	2.8×10^{-3}

¹Risk estimate adjusted down one order of magnitude to reflect limited likelihood of inducing lethal cancer (USEPA, 1987). See text for further information.

Notes: SWMU = Solid Waste Management Unit.
 Weight of Evidence Class = Weight of evidence for human carcinogenicity.
 A = Known human carcinogen.

The non-carcinogenic HIs associated with surface water use as a drinking water source at SWMU 4 are provided in Table 5-28. The HI for ingestion of arsenic in drinking water is 10 which indicates that significant adverse health effects might occur if the groundwater were to be used a potable water source.

**Table 5-28
Hazard Indices Associated with Exposures
to Groundwater at SWMU 5**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemicals	Ingestion	Chemical-Specific HQ/Hazard Index
Metals		
Arsenic	10	10
Total HQ	10	10

Notes: SWMU = Solid Waste Management Unit.
HQ = Hazard Quotient.
HI = Hazard Index.

Discussion. Arsenic was detected in the groundwater at SWMU 5 at levels which would represent a highly significant health risk both in terms of carcinogenic and non-carcinogenic risks if the groundwater were to be used as a drinking water source. However, it is highly unlikely that the groundwater would be used for potable purposes. The general water quality of the surficial aquifer SWMU 5 is characterized by saline conditions as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely or limited at best. Although the surficial aquifer is technically classified G-II, secondary standards as described in FAC Chapter 17.550.320 are exceeded in most of the surficial wells at SWMU 5 for TDS, chloride, and sulfate.

Sampling of the Surface Water at SWMU 5. Three surface water samples were collected at SWMU 5. The analytical results of these samples are provided in Table 5-29. A comparison of the results with background levels and the two screening criteria indicate that arsenic is the only COC in the surface water at SWMU 5.

Exposure Concentrations for Groundwater Use at SWMU 5. The exposure examined in this risk analysis of the surface water at SWMU 5 is the use of this water as a drinking water source. Shower vapor exposures are not considered because the only COC is arsenic, which is a non-volatile element. The exposure point concentrations used in this analysis are provided in Table 5-30. Also provided are the Lifetime Adjusted Daily Doses (LADD) used in calculating the carcinogenic risks and the Average Daily Doses (ADD) used in calculating non-carcinogenic risks.

Table 5-29
Chemicals Detected in Surface Water at SWMU 5

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration ($\mu\text{g}/\ell$)	Frequency of Detection	Maximum Background Concentration ($\mu\text{g}/\ell$)	1×10^{-6} or HI = 1.0 Screening Concentration ($\mu\text{g}/\ell$)	RCRA Screening Level ($\mu\text{g}/\ell$)	Chemical of Concern
Metals						
Arsenic	1.0 - 1.7	3/3	1.4	0.049	¹ 50	Yes
Barium	9.7 - 12.4	3/3	15.4	2,600	¹ 1,000	No
Chromium	² 2.0	2/3	4	180	¹ 50	No
Copper	24.5	1/3	37.2	1,400	¹ 1,300	No
Cyanide	3.9 - 7.4	3/3	3	730	1,200	No
Lead	1.1 - 2.2	3/3	1.5	NI	¹ 50	No
Selenium	1.4 - 5.1	2/3	2.6	180	¹ 50	No
Vanadium	3.8	1/3	3.6	260	245	No

¹Federal Maximum Contaminant Limit (MCL).
²Both samples at this same concentration.

Notes: ND = not detected.
NI = no information from the USEPA.
 $\mu\text{g}/\ell$ = micrograms per liter.
RCRA = Resource Conservation and Recovery Act.

Table 5-30
Exposure Point Concentrations and Dose Values of Chemicals of Concern in Surface Water at SWMU 5

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Exposure Point Concentration ($\mu\text{g}/\ell$)	Average Daily Dose (mg/kg/day)	Lifetime Average Daily Dose (mg/kg/day)
Metals			
Arsenic	1.7	4.7×10^{-6}	2.0×10^{-6}

Notes: SWMU = Solid Waste Management Unit.
 $\mu\text{g}/\ell$ = micrograms per liter.
mg/kg/day = milligrams per kilogram per day.

Risk Assessment of Groundwater Use at SWMU 5. The risks have been calculated for use of the surface water at SWMU 5 as a drinking water source and are provided in Table 5-31. The total upper bound cancer risk associated with ingestion of the groundwater is 3.5×10^{-5} .

**Table 5-31
Upper Bound Excess Cancer Risk Estimates
Associated with Exposure to Surface Water at SWMU 5**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Weight of Evidence Class	Exposure Route	Chemical-specific Risk/ Total Risk
		Ingestion	
Metals			
Arsenic	A	3.5×10^{-5}	3.5×10^{-5}

¹Risk estimate adjusted down one order of magnitude to reflect limited likelihood of inducing lethal cancer (USEPA, 1987). See text for further information.

Notes: SWMU = Solid Waste Management Unit.
Weight of Evidence Class = Weight of evidence for human carcinogenicity.
A = Known human carcinogen.

The non-carcinogenic HIs associated with surface water use as a drinking water source at SWMU 5 are provided in Table 5-32. The HI for ingestion of arsenic in drinking water is 0.2 which indicates that no adverse health effects should be expected from ingestion of this water.

**Table 5-32
Hazard Indices Associated with Exposures
to Surface Water at SWMU 5**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemicals	Ingestion	Chemical-Specific HQ/Hazard Index
Metals		
Arsenic	0.2	0.2
Total HQ	0.2	0.2

Notes: SWMU = Solid Waste Management Unit.
HQ = Hazard Quotient.
HI = Hazard Index.

Discussion. The use of the surface water as a drinking water source would be unacceptable due to the increased carcinogenic risks associated with arsenic ingestion. However, the use of the surface water as a potable water source is highly unlikely. The general water quality of the surficial aquifer at SWMU 5 is characterized by saline conditions as measured by TDS. Based on this parameter alone, potable use of the aquifer is not practical. Agricultural and industrial uses are also unlikely or limited at best. Although the surficial aquifer at SWMU 5 is technically classified G-II, secondary standards described in FAC Chapter 17.550.320 are exceeded in most of the surficial wells for TDS, chloride, and sulfate.

Also the general water quality parameters such as TDS, alkalinity, and hardness indicate that the surface water at SWMU 5 is affected by the estuarine influences of Sherman Creek, Pablo Creek, and Chicopit Bay. This observation is supported by visual indications that parts of the surface water conveyance system within SWMU 5 are tidally influenced, with changes in surface water elevations ranging from approximately 0 to 4 feet. Therefore, it is highly unlikely that the surface water would be used as a potable water source.

However, if the groundwater were to be used as a potable water source for drinking water, the health effects could be significant since the carcinogenic risks are much higher than the acceptable level of 1×10^{-6} . In addition, the non-carcinogenic toxic effects could also be significant since the HI is equal to 10. There is also insufficient information available to determine if the presence of arsenic is due to contamination leaking from SWMU 5 or if it is due to natural sources. Arsenic was found in the surface water samples, although at lower levels than at SWMU 5. However, even this level ($1.4 \mu\text{g}/\ell$) is associated with a cancer risk of 1×10^{-6} indicating that some level of carcinogenic risk would have to be acceptable if the surface water at SWMU 5 or NAVSTA Mayport were to be used as a potable water source.

5.1.5 Human Health Effects Assessment for SWMU 13 SWMU 13, the Old Fire Fighting Training Area, consists of three areas identified from aerial photographs and discussions with site personnel. The areas were located at the south end of an abandoned runway now occupied by buildings, parking areas, and grassy medians. This site was used as a fire fighting training area from 1973 to 1982. The areas consisted of low, earthen berms constructed on an abandoned asphalt runway. During use of the area, fuel was floated on top of water placed within the pits (approximately two-thirds part water to one-third part fuel) and then ignited. Residual fuels and water either evaporated or infiltrated at the sites. No collection sump or treatment system was used.

It is estimated that 300 to 400 gallons of fuel was burned per month. The composition was approximately 90 to 95 percent waste fuel (AVGAS, JP-4, or JP-5) and five to 10 percent waste oils with minor percentages of solvents, paint thinner, trichloroethylene, toluene, transformer oil (unknown if it contained PCB), and hydraulic fluid (unknown if it contained PCB). Fuels and other items not consumed during training exercises remained in the pit or ran off the sides of the runway. During construction of a new pipeline, the soil of the southernmost area was disturbed to a depth of 4 to 6 feet. The soils may have been spread over the immediate area of the fire fighting training area. The area was paved with asphalt as part of a parking lot.

SWMU 13 Soil Samples. Three soil samples were collected at SWMU 13. The analytical results of these soil samples are provided in Table 5-33. These results are compared with the two screening criteria. No COCs are identified in the soil at SWMU 13.

SWMU 13 Groundwater Samples. Three groundwater samples were collected at SWMU 13. The analytical results of these groundwater samples are provided in Table 5-34. These results are compared with the levels detected in the background groundwater samples as well as the two screening criteria. No COCs were identified in the groundwater at SWMU 13.

Discussion. There are no risks associated with exposure to either the soil or the groundwater at SWMU 13. It is, therefore, recommended that this SWMU be considered for "No Further Action" status.

5.1.6 Human Health Effects Assessment for SWMU 22 The Building 1600 Blasting Area is a fenced area located just to the northeast of Building 1600, which is located in the central part of Mayport, about 400 feet northeast of SWMU 2. Abrasive media blasting was conducted in a sheet metal Baker hut set on a concrete base and concrete foundation. The concrete base extends past the Baker hut approximately 10 feet and is encircled by a chain link fence. A dust collector attached to the back of the building collected dust and abrasives during blasting operations. Equipment blasted in this area was largely ground support equipment, most of which was painted with yellow enamel paint and zinc-containing primers. The abrasive media used for blasting was Black Beauty™. The used Black Beauty™ was analyzed by the Extraction Procedure and determined to be toxic. The area has been in use since 1985. Blasting operations have recently (1992) terminated at this site. It is presently used as a temporary storage area for ground support equipment.

SWMU 22 Soil Samples. Nine soil samples were collected from SWMU 22. Five were surface (0 to 12 inches) soil samples, and four were taken at the water table. The analytical results of these nine soil samples are provided in Table 5-35. The analytical results are also compared to the two screening criteria. No COCs are identified in the soil at SWMU 22.

SWMU 22 Groundwater Samples. One groundwater sample was also taken from a monitoring well placed at the site during this sampling episode. The analytical results of this sample are provided in Table 5-36. These results were compared with the levels detected in the background groundwater wells as well as the two screening criteria. Comparing the concentration of the chemicals detected in the groundwater at SWMU 22, no COCs were identified.

Discussion. There are no chemicals of concern identified for SWMU 22 in soil or groundwater. The data from the single groundwater sample at SWMU 22 may need to be augmented to confirm that there are no health risks due to groundwater contamination at SWMU 22. The lack of COCs suggests that there are no significant carcinogenic or non-carcinogenic risks associated with exposure to the soils or groundwater at SWMU 22. Therefore, this SWMU should be considered a "Monitor Only" site as a prelude to "No Further Action."

Uncertainties and Limitations. The quantitative exposure estimates, the estimated upper bound cancer risks, and the Hazard Indices used in the human

**Table 5-33
Chemicals Detected in the Soil at SWMU 13**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration (mg/kg)	Frequency of Detections	1x10 ⁻⁶ or HI=1 Screening Concentrations (mg/kg)	RCRA Residential Soil Screening Level (mg/kg)	Chemical of Concern
Metals					
Arsenic	0.17 - 0.44	2/3	0.97	80	No
Barium	2.5 - 7.8	3/3	5,500	4,000	No
Chromium	1.8 - 3.2	3/3	390	400	No
Copper	0.41 - 1.95	3/3	2,900	2,960	No
Lead	2.7	1/3	NI	NI	No
Nickel	2.9	1/3	1,600	2,000	No
Zinc	50.9	1/3	16,000	16,000	No
Volatile Aromatic Hydrocarbons					
Trichlorofluoromethane	0.036	1/3	23,000	20,000	No
Xylenes	0.003 - 0.0075	2/3	160,000	200,000	No
Semivolatile Organic Chemicals					
Carbon disulfide	0.002	1/3	7,800	8,000	No
Polycyclic Aromatic Hydrocarbons					
Pyrene	0.042	1/3	3.6	1.48	No
Pesticides					
Chlordane	0.037	1/3	1.3	0.500	No
Notes: NI = no information from the USEPA. mg/kg = milligrams per kilogram.					

**Table 5-34
Chemicals Detected in Groundwater at SWMU 13**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration (µg/l)	Frequency of Detection	Maximum Background Concentration (µg/l)	1x10 ⁻⁶ or HI=1 Screening Concentrations (µg/l)	RCRA Screening Level (µg/l)	Chemical of Concern
Metals						
Arsenic	2.2 - 11.3	5/6	14.3	0.049	¹ 50	No
Barium	8.7 - 63.3	6/6	0.82	2,600	¹ 1,000	No
Chromium	11 - 56.6	2/6	ND	180	¹ 50	No
Copper	19.8 - 69.5	2/6	1.4	1,400	¹ 1,300	No
Cyanide	3.3 - 4.5	2/6	ND	730	¹ 200	No
Lead	0.8 - 13.6	3/6	2.5	NI	¹ 50	No
Mercury	0.13	1/6	ND	11	¹ 2	No
Nickel	8 - 146	2/6	ND	1,600	700	No
Selenium	2.2	1/6	0.63	180	¹ 10	No
Vanadium	2.6 - 68.6	6/6	9.4	260	245	No
Zinc	2.2 - 99.9	6/6	10.2	7,300	7,000	No
Volatile Organic Chemicals						
Acetone	61	1/6	ND	3,700	4,000	No
Semivolatile Organic Chemicals						
Carbon Disulfide	1	1/6	1	21	4,000	No

¹ Federal Maximum Contaminant Limit (MCL).

Notes: NI = no information from the USEPA.

ND = not detected.

µg/l = micrograms per liter.

**Table 5-35
Chemicals Detected in the Soil at SWMU 22**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration (mg/kg)	Frequency of Detections	1x10 ⁻⁶ or HI=1 Screening Concentration (mg/kg)	RCRA Residential Soil Screening Level (mg/kg)	Chemical of Concern
Metals					
Arsenic	3.4	1/9	0.97	80	No
Barium	5.5 - 8.7	3/9	5,500	4,000	No
Chromium	13.3 - 14.9	2/9	390	400	No
Copper	5.6 - 11.6	3/9	2,900	2,960	No
Lead	1.3 - 5.9	3/9	NI	NI	No
Nickel	7.6 - 21.6	2/9	1,600	2,000	No
Vanadium	2.2 - 10.2	2/9	550	560	No
Zinc	50.9	1/9	16,000	16,000	No
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene	0.070	1/9	0.290	0.120	No

Notes: NI = no information from the USEPA.
mg/kg = milligrams per kilogram.

**Table 5-36
Chemicals Detected in Groundwater at SWMU 22**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Chemical	Range of Detected Concentration ($\mu\text{g}/\ell$)	Frequency of Detection	Maximum Background Concentration ($\mu\text{g}/\ell$)	1×10^{-6} or HI=1 Screening Concentration ($\mu\text{g}/\ell$)	RCRA Screening Level ($\mu\text{g}/\ell$)	Chemical of Concern
Metals						
Arsenic	3.2	1/1	14.3	0.049	¹ 50	No
Barium	11.5	1/1	0.82	2,600	¹ 1,000	No
Chromium	5.9	1/1	ND	180	¹ 50	No
Copper	9.1	1/1	1.4	1,400	¹ 1,300	No
Lead	1.6	1/1	2.5	NI	¹ 50	No
Nickel	8.3	1/1	ND	1,600	700	No
Vanadium	6.8	1/1	9.4	260	245	No
Zinc	20.6	1/1	10.2	7,300	7,000	No

¹ Federal Maximum Contaminant Limit (MCL).

Notes: NI = no information from the USEPA.
ND = not detected.
 $\mu\text{g}/\ell$ = micrograms per liter.

health evaluation are based upon a number of conservative assumptions that are intended to be protective of human health. As a result, the quantitation estimates or risk action levels found in this evaluation are subject to a number of sources of uncertainty, all rooted in the conservatism of the estimates. These sources of uncertainty can be categorized into site-specific factors and toxicity assessment factors.

The toxicity assessment factors include:

- the likelihood of the exposure pathway described in the risk assessment to actually occur;
- the exposure assumptions used in the assessment, which include the frequency, duration, and magnitude of the exposure;
- the extrapolation of animal toxicity data to predict toxicity in humans;
- use of the linearized multistage model to derive cancer slope factors; and
- use of uncertainty factors and animal data in deriving human reference doses.

An additional level of conservatism in this assessment is due to the use of residential soil and water screening values rather than worker or occupational screening levels. This was done for two reasons.

First, these residential screening values are the most stringent currently in use by the USEPA and represent the most conservative approach for a risk assessment. If the chemicals detected at the site are not considered COCs using the residential exposure scenario, then they are also would not be COCs for worker or occupational exposures. This is because exposure duration is less generally in the work place and sensitive subpopulation exposures need not be considered.

The second reason for using the residential guidelines has to do with fishing activity observed just to the southwest of the SWMU 2 area. While the USEPA guidance (USEPA, 1990a) states that Federal (or State) Water Quality Criteria may be used as action levels when fish and shellfish are taken for consumption, Federal and State MCLs can also be used. For this reason, both groundwater and surface water were compared to Federal (or State) MCLs, which are also part of the residential guidelines.

It is important to note that the cited cancer risks are all upper bound estimates. That is, they are estimates of the upper limit of that an individual may contract cancer as a result of exposure to these constituents and not estimates of the actual likelihood that any individual will contract cancer. The true rates of cancer induction by these constituents are likely to be lower than the estimate and may even be zero for one or more constituents.

There are fewer site-specific uncertainty factors. They include:

- the lack of background soil data, and
- the lack of long-term monitoring data at this site.

The lack of background soil data is a data gap. However, it is less important than it would have been if there had been significant health risks associated with arsenic, or any other metal, exposure. Still, it is important to know background level of metals such as arsenic and mercury because they are highly

toxic and their presence can drastically influence the results of a risk assessment.

Long-term monitoring data will be necessary to support a decision of "No Further Action" at SWMU 22. However, this information will be obtained as a result of the suggested "Monitor Only" decision suggested for SWMU 22. The use of the Group I area is also unknown and could be considered a point of uncertainty if the residential use scenario had not been used in this risk assessment.

Although some small areas could conceivably be used for residential housing in the future, the majority of the Group I area is wetlands. It is also unlikely that NAVSTA Mayport would be abandoned for residential development. This makes it very unlikely that this area would be developed for residential use. It also makes several of the exposure scenarios, especially those concerned with soil ingestion and dust inhalation, overly conservative. There is little likelihood of a child eating mud, and emission of soil particulates are greatly decreased when the soil is wet.

Conclusion. This human health evaluation indicates that, with the exception of the PCB "hotspot" at SWMU 2, there are no excessive carcinogenic or non-carcinogenic health risks associated with residential exposure to the soil and groundwater at Group I area, NAVSTA Mayport. Based on human health risk considerations, SWMUs 13 and 22 may be recommended for either "No Further Action" or "Monitor Only" actions. The PCB hotspot needs further delineation and remediation. However, the remainder of SWMU 2 is recommended to be a "Monitor Only" or "No Further Action" site.

5.2 ECOLOGICAL ASSESSMENT. The purpose of the Ecological Assessment (EA) is to evaluate if contamination from SWMUs present in environmental media are a threat, or potential releases may be a threat, to the environment and warrant interim corrective measures or a corrective measures study. The EA results may also be used to support a No Further Action recommendation. The EA includes identification of potential exposure routes for receptors to contaminated media and comparison of the contaminant concentrations in media with quantitative or qualitative exposure limit criteria (USEPA, 1989a).

The ecological assessment for NAVSTA Mayport follows current USEPA and State of Florida guidance for conducting ecological assessments at hazardous waste sites. Guidance consulted includes *Risk Assessment Guidelines for Non-Superfund Sites* (FDER, 1990), *RCRA Facilities Investigation Guidance* (USEPA, 1989b), *Risk Assessment Guidance for Superfund Vol II: Environmental Evaluation Manual* (USEPA, 1989c), *Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference* (USEPA, 1991c), and *Ecological Assessment of Superfund Sites: An Overview* (USEPA, 1991b).

The ecological assessment for SWMUs 2, 3, 4, 5, 13, and 22 includes selection of exposure pathways and receptors (5.2.1), selection of contaminants of concern (5.2.2), ecotoxicity assessment (5.2.3), aquatic assessment (5.2.4) and terrestrial wildlife assessment (5.2.5).

5.2.1 Selection of Exposure Pathways and Receptors The location of aquatic and terrestrial habitats present on and near each of the SWMUs identified during the biological investigation (Section 4.4) are shown on Figure 3-5. These habitats

include coastal marsh, freshwater marsh, weedy transitional freshwater wetland, weedy ditches and ditch banks, planted pines, open field, mowed field and cabbage palm hammock as classified by Myers and Ewel (1990). Aquatic life (fish, invertebrates and plants) and terrestrial organisms (reptiles, amphibians, birds, mammals and invertebrates) that reside within the habitats are all potential receptors of contamination from the SWMUs. Figure 5-1 identifies the routes of exposure for ecological receptors at SWMUs 2, 3, 4, 5, 13 and 22 which are evaluated in the ecological assessment. Selection of exposure pathways for aquatic and terrestrial receptors are discussed in the following sections for each SWMU.

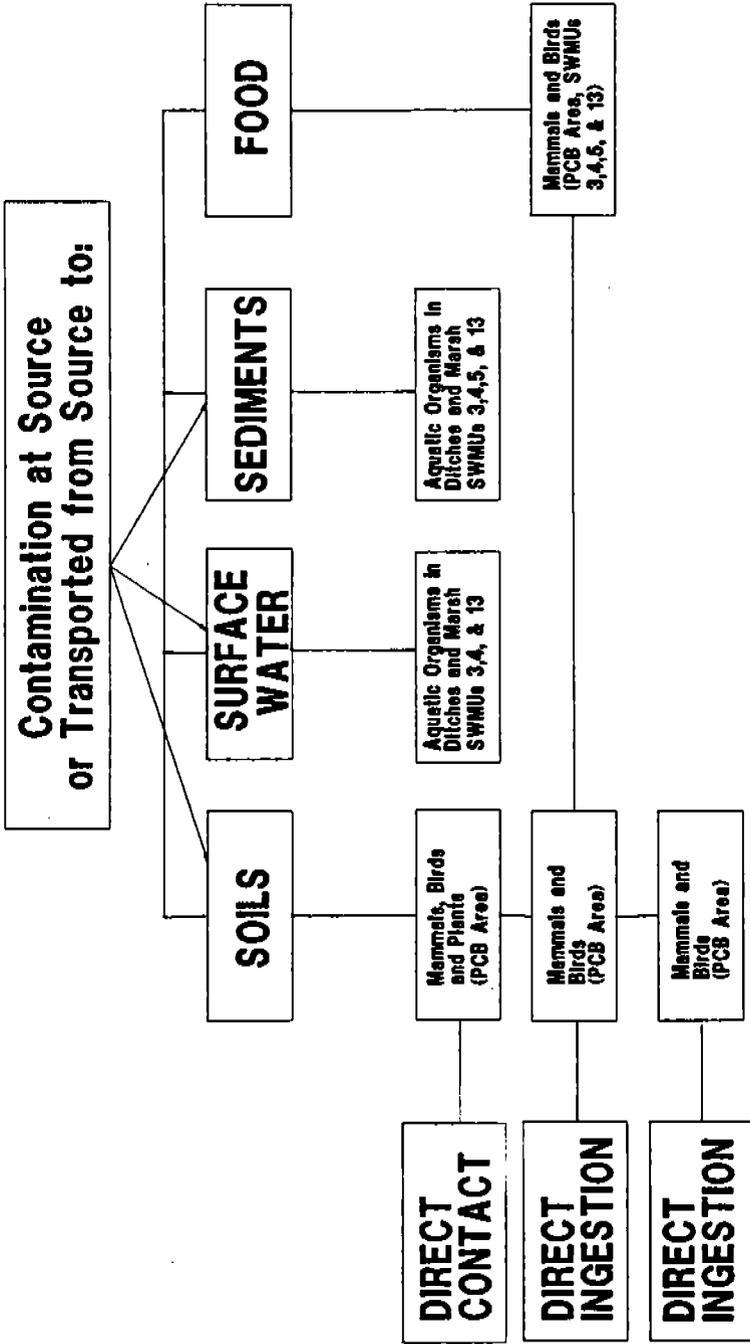
There is no evidence of contaminated groundwater plumes which might impact surrounding surface waters. Therefore, ecological risks associated with the potential discharge of contaminated groundwater to surface waters are not evaluated since no release has been observed. If further data suggests potential for exposure of aquatic life to contaminated groundwater, this pathway will be evaluated.

5.2.1.1 SWMU 2 SWMU 2 is a former landfill that was subsequently covered with soil and paved. The immediate area surrounding SWMU 2 is paved with a grassed berm to the south and road and parking area to the north. There are no surface waters on the site or surrounding the site. The area does not provide habitat for ecological receptors either aquatic or terrestrial, therefore no potential exposure routes for contamination were identified for this SWMU.

5.2.1.2 SWMU 2 PCB Soils Area PCB contamination in soils was identified in an area to the north of SWMU 2. The area of contaminated soils is covered with mowed grass with pine plantations present to the north and west of the contaminated area. Terrestrial wildlife inhabiting the forested areas may come into contact with the soil contamination during foraging or other daily activities. Potential exposures for terrestrial wildlife are associated primarily with surface soils (0 to 12 inches) by direct ingestion or consumption of organisms having contact with soil. Surface soils (0 to 6 inches) were collected on a grid pattern in the PCB soils area near monitoring well MPT-2-MW-9S (Figure 4-9). PCBs, as Aroclor 1260, were measured at concentrations ranging from 0.23 to 120 mg/kg. The selected exposure routes for terrestrial wildlife to PCBs in soils within this area include incidental ingestion and dietary ingestion of contaminated food. Estimation of PCB exposure concentrations and risks for terrestrial wildlife is provided in Section 5.3.5.

Aquatic habitat is not present on or near the PCB soils contamination area. Therefore potential exposures for aquatic life to contamination in surface water or sediments were not identified.

5.2.1.3 SWMU 3 SWMU 3 is a former landfill located southwest of SWMU 2 and extends under the northwestern corner of the eastern dredge spoil area. The southeastern portion of the site is a transitional freshwater wetland (Figure 3-5). The remainder of the site is mowed grass, road and berm. The site drains to a swale to the north which discharges to a ditch bordering the western boundary of the landfill at the base of a berm. The western ditch drains to the north and intersects the Patrol road ditch system to the northwest. Sediment and surface water samples are not available from the ditch bordering the SWMU. One



**FIGURE 5-1
ROUTES OF EXPOSURE
FOR ECOLOGICAL RECEPTORS**



**RCRA FACILITY
INVESTIGATION REPORT
PHASE I**
**U.S. NAVAL STATION
MAYPORT, FLORIDA**

sediment and surface water sample (MPT-2-SW/SD-7) was located at the point of confluence of western boundary ditch with the Patrol Road ditch system.

Aquatic receptors in the drainage ditch surrounding the Group I SWMUs were identified during the biological field investigation and include the organisms collected and identified during the qualitative aquatic sampling. Three invertebrates including white shrimp (*Penaeus setiferus*), blue crab (*Callinectes sapidus*), and eastern oyster (*Crassostrea virginia*) as well as 12 freshwater and saltwater fish species were identified as the primary receptors. Also identified were several benthic macroinvertebrates, phytoplankton and zooplankton species (Appendix C). Direct contact exposures for aquatic life to contaminated surface water and sediments are evaluated in Sections 5.2.4.1 and 5.2.4.2, respectively.

Surface soil samples were not collected at SWMU 3 as the landfill was reportedly filled and covered with top soil. Surface samples from soils on the landfill would be needed to complete an exposure assessment for terrestrial wildlife. Potential exposures for terrestrial receptors are not evaluated.

5.2.1.4 SWMU 4 SWMU 4 is a former landfill. The site is located to the south, southwest of SWMU 3. SWMU 4 provides open field habitat. Habitat for aquatic receptors is present in the ditch system bordering the site on the northwestern boundary and a ditch that bisects the SWMU. Two sediment and surface water samples were collected from the northwest ditch (MPT-2-SW/SD-7 and MPT-2-SW/SD-8). Direct contact exposures for aquatic life to contaminated surface water and sediments are evaluated in Sections 5.2.4.1 and 5.2.4.2, respectively.

Surface soil samples were not collected at SWMU 4 as the landfill was reportedly filled and covered with top soil. Soils samples were collected during monitoring well installation at the water table. The soil analyses represent samples at depth encircling the SWMU and do not represent soils to which terrestrial wildlife would be exposed. Surface samples from soils on the landfill would be needed to complete an exposure assessment for terrestrial wildlife. Potential exposures for terrestrial receptors are not evaluated.

5.2.1.5 SWMU 5 SWMU 5 is a former landfill located north of the eastern dredge spoil area and east of SWMUs 2, 3 and 4. Upon closure of the landfill a soil cover was added and a surface disposal operation initiated. SWMU 5 provides a variety of wildlife habitats including freshwater marsh, coastal marsh, open field, mowed field, cabbage palm hammock and pine plantations. Aquatic habitat is provided by the ditch system bordering the SWMU on the northeast and eastern boundaries. Direct contact exposures for aquatic life to contaminated surface water and sediments are evaluated in Sections 5.2.4.1 and 5.2.4.2, respectively.

Surface soil samples were not collected at SWMU 5 as the landfill was reportedly filled and covered with top soil. Soils samples were collected during monitoring well installation from the subsurface at the water table. The soil analyses are from locations on the perimeter of the SWMU and do not represent soils to which terrestrial wildlife would be exposed. Surface samples from soils on the landfill would be needed to complete an exposure assessment for terrestrial wildlife. Potential exposures for terrestrial receptors are not evaluated.

5.2.1.6 SWMU 13 SWMU 13 is a former fire fighting training area where waste oils and solvents were burned in a bermed pit. Construction in the area has

resulted in spreading of the contaminated soils, which were subsequently covered with asphalt and buildings. Because the soils are covered by buildings and/or pavement, exposures for terrestrial wildlife to soils contamination are not expected. Habitat for aquatic receptors is provided by ditches to the east and south of SWMU 13. Three sediment samples were collected near SWMU 13 with only one of these samples is from an area with aquatic habitat (MPT-13-SD-3). Direct contact exposures for aquatic life to contamination detected in the sediments are evaluated in Section 5.2.4.2.

5.2.1.7 SWMU 22 The Building 1600 Blasting Area (SWMU 22) is a fenced area located about 400 feet northeast of SWMU 2. Potential exposure pathways for terrestrial wildlife to soils contamination were not identified. Wildlife use of the area on and near SWMU 22 is expected to be minimal as the surrounding areas, including planted pines, pavement and mowed grass, provide little terrestrial wildlife habitat. Exposure pathways for aquatic receptors were also not identified as aquatic habitat is not present on or near the SWMU.

5.2.2 Selection of Contaminants of Concern COCs for surface water and sediments are selected based upon a review of the analytical results for each media collected during the RFI and previous studies. Available water quality standards for surface water contaminants of concern are summarized in Table 5-37 for reference. Sampling data for surface water and sediments are summarized in Tables 5-37 through 5-39, respectively. Locations of samples in relation to the SWMUs are indicated on Figure 3-4. Information is summarized for each analyte according to the frequency of detection, range of concentrations detected, average concentration detected and average concentrations detected in background samples. COCs for soils are limited to PCBs (Aroclor 1260) for the contaminated soils area near SWMU 2. Contaminants of concern for groundwater were not selected as exposure pathways were not identified (Section 5.2.1).

Inorganic and organic contaminants detected in surface water and sediments were eliminated from consideration in the ecological assessment for reasons explained in the following sections. Elimination is based on comparisons of metal concentrations with background and consideration of possible field and lab contamination of samples.

Inorganics in Surface Water and Sediments. In order to determine inorganics that represent actual contamination, detected concentrations are compared to an average of concentrations from background locations (MPT-B-2-SW/SD-1, MPT-B-2-SW/SD-2, and MPT-B-SW/SD-3). Following USEPA Region IV risk assessment guidelines (USEPA, 1991b), inorganics were selected as being of concern if the average concentration detected exceeded two times the average background concentration. All average concentrations of metals in surface water samples, with the exception of zinc fall below the screening concentrations. Arsenic, barium, chromium, copper, cyanide, lead, vanadium, and selenium in surface water samples were eliminated based on the background screening. Arsenic, barium, chromium, nickel, selenium, and vanadium were eliminated as COCs in sediments based on screening with background sediments. Silver was eliminated as it was detected at only one of eight sample locations at a concentration lower than the quantification limits for the background samples (Table 5-38).

Organic Chemicals in Surface Water and Sediments. Di-n-butylphthalate was detected in three of eight sediment samples at an average concentration of 70

Table 5-37
Available Water Quality Standards ($\mu\text{g}/\ell$) for
Contaminants of Concern in Surface Water
Ecological Assessment

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

	Federal Freshwater AWQC		Federal Marine AWQC		State Freshwater ¹	State Marine ¹
	Acute	Chronic	Acute	Chronic		
Halomethanes	^{2,3} 11,000	--	^{2,3} 12,000	^{2,3} 6,400	470.8	470.8
Dissolved Oxygen	--	--	--	--	>5mg/ ℓ	>5 mg/ ℓ ⁴ >4 mg/ ℓ
pH	--	--	--	--	6.5 - 8.5	6.5 - 8.5
Ammonia	--	--	--	--	\leq 20	NA
Zinc	⁵ 120	⁵ 110	⁵ 95	⁵ 86	⁵ 106	86.0

¹Florida Administrative Code (FAC)-17-302 Surface Water Quality Standards, February 13, 1992. Standards for Class III Waters.

²LOEL-Lowest observed effect level reported in AWQC Document. Insufficient data available to derive criteria.

³45FR79334

⁴45FR79339

⁵Hardness dependent criteria. Calculated based on 100 mg/ ℓ as CaCO₃.

Notes: NA = not available.

AWQC = ambient water quality criteria.

-- = deference to State standard.

**Table 5-38
Summary of Surface Water Data
SWMUs 2, 3, 4, and 5
Ecological Assessment**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

	Frequency of Detection ¹	Range of Detected Concentrations ($\mu\text{g}/\text{l}$)	Average of Detected Concentrations ($\mu\text{g}/\text{l}$)	Average of Detected Background Concentrations ² ($\mu\text{g}/\text{l}$)	Selected as a Chemical of Concern
Analyte					
Arsenic	7/7	1.0 - 4.3	2.1	1.13	No
Barium	7/7	9.7 - 22.3	14	13	No
Chromium	2/7	2.0	2.0	³ 4.0	No
Copper	4/7	3.8 - 24.5	15	20	No
Cyanide	6/7	3.9 - 7.4	5.3	³ 3.0	No
Lead	6/7	1.1 - 3.3	2.5	1.3	No
Selenium	5/7	1.4 - 7.7	4	³ 2.6	No
Vanadium	2/7	3.8 - 6.1	5.0	³ 3.6	No
Zinc	3/7	6.3 - 34.4	22	⁴ 6.1 - 23.5	Yes
Expanded Site Inspection (ECJ, 1989)					
Trans-1,2-dichloroethene	1/3	6	-	-	No
Vinyl chloride	1/3	3	-	-	No
4,4'-DDD	1/3	20	-	-	No
4,4'-DDE	1/3	0.01	-	-	No
Chromium	1/3	100	-	-	No
Geraghty and Miller (1984)					
Zinc	1/1	18	-	-	Yes

¹Samples included are MPT-2-SW-4, MPT-2-SW-5, MPT-2-SW-6, MPT-2-SW-7, MPT-2-SW-7A, MPT-2-SW-8 and MPT-2-SW-9.

²Average of MPT-B-SW-1, MPT-B-SW-2, and (mean of MPT-B-SW-3 and MPT-SWDUP1).

³Detected in only one sample.

⁴Range of quantification limits.

Table 5-39
Summary of Sediment Data for SWMUs 2, 3, 4, 5, and 13
Ecological Assessment

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

	Frequency of Detection ¹	Range of Detected Concentrations	Average of Detected Concentrations	Average of Background Concentrations ²	Selected as a Chemical of Concern
Organics (µg/kg)					
4,4'-DDD	4/8	1.3 - 6	3.2	< ³ 1 - 7.4	Yes
4,4'-DDE	5/8	1.5 - 4.1	2.9	3	Yes
4,4-DDT	1/8	56	56	0.8	Yes
Benzo(a)anthracene	2/8	61 - 81	71	< ³ 430 - 650	Yes
Benzo(a)pyrene	2/8	59 - 74	67	< ³ 430 - 650	Yes
Carbon disulfide	3/8	3 - 54	27	51	No
Chrysene	3/8	65 - 130	96	< ³ 430 - 650	Yes
Di-n-butyl phthalate	3/8	63 - 78	70	62	No
Fluoranthene	2/8	110 - 150	130	< ³ 430 - 650	Yes
Pentachlorophenol	1/8	430	430	< ³ 2,100 - 3,100	Yes
Phenanthrene	1/8	100	100	< ³ 430 - 650	Yes
Pyrene	3/8	100 - 130	113	< ³ 430 - 650	Yes
Metals (mg/kg)					
Arsenic	8/8	0.51 - 10.8	3.7	3.0	No
Barium	8/8	3.8 - 33.7	13	8.9	No
Chromium	8/8	2.7 - 50.1	15	11	No
Copper	8/8	1.6 - 15.7	8.2	2.5	Yes
Lead	8/8	3.5 - 29.1	13	5.2	Yes
Mercury	2/8	0.11 - 0.39	0.25	< ³ 0.068 - 0.13	Yes
Nickel	4/8	2.4 - 13.3	8.9	6.1	No
Selenium	3/8	0.43 - 0.76	0.56	0.43	No
Silver	1/8	0.59	0.59	³ 0.64 - 1.1	No
Vanadium	7/8	1.4 - 56.5	18	11	No
Zinc	8/8	12 - 96.5	47	14	Yes
Expanded Site Inspection (ECJ, 1989)					
Bis (2-ethylhexyl) phthalate	1/3	1.4	-	-	-
4,4'-DDD	0/3	-	-	9	-
4,4'-DDE	1/3	0.01	-	15 - 36	-
4,4'-DDT	0/3	-	-	70	-
¹ Samples included are MPT-2-SD-4, MPT-2-SD-5, MPT-2-SD-6, MPT-2-SD-7, MPT-2-SD-7A, MPT-2-SD-8, MPT-2-SD-9 and MPT-13-SD-3.					
² Average of MPT-B-SD-1, MPT-B-SD-2, and (mean of MPT-B-SD-3 and B-SD-DUP1).					
³ Range of quantification limits for MPT-B-SD-1, MPT-B-SD-2, MPT-B-SD-DUP1.					

$\mu\text{g}/\text{kg}$ and in all three background samples at an average concentration of 63 $\mu\text{g}/\text{kg}$. As the phthalates were detected at background locations, they are not likely to be associated with waste disposal activities at the SWMUs. Phthalates are possibly introduced to samples as a result of field collection and handling procedures. Phthalates are also considered common laboratory contaminants. These chemicals were not selected as COCs for sediments.

Carbon disulfide is a natural constituent of marine systems (Verschuere, 1983); therefore, it is not considered to be a contaminant and is not evaluated in the ecological assessment. All other organic chemicals detected in sediments were selected as COCs.

Consideration of Previous Data. Information available from previous sampling events for surface water and sediments are included in Tables 5-38 and 5-39. This information was considered qualitatively in the selection of contaminants of concern. Trans-1,2-dichloroethene, vinyl chloride, 4,4'-DDD, 4,4'-DDE, and chromium were detected in surface water samples collected during the ESI. Trans-1,2-dichloroethene, vinyl chloride, DDD, and DDE were not selected as COCs in surface water as they were not detected in surface water samples analyzed during the RFI. Chromium was not selected since concentrations measured during the RFI were below background. Zinc was selected. DDD and DDE are highly insoluble, it is likely that the concentrations measured represent contamination adhering to sediment particles. Both were selected as contaminants of concern for sediments. DDD, DDE, and DDT were detected in sediment samples collected during the ESI. All are selected as COCs for sediments.

Contaminants of Concern. COCs selected for surface water and sediments are indicated, respectively, on Tables 5-37 and 5-38. The COC for surface water is zinc. Contaminants of Concern for sediments include DDT, DDD, DDE, benzo(a)anthracene, benzo(a)pyrene, chrysene, fluoranthene, pentachlorophenol, phenanthrene, pyrene, copper, lead, mercury, and zinc. COCs for soils are limited to PCBs as Aroclor 1260. Concentrations for the COCs for sediments measured at each sampling location are shown on Table 5-40.

5.2.3 Ecotoxicity Assessment

5.2.3.1 Surface Water Federal Ambient Water Quality Criteria (AWQC) are available for zinc. Acute and chronic freshwater AWQC are 120 and 100 $\mu\text{g}/\text{l}$, respectively. Marine acute and chronic AWQC are 95 and 86 $\mu\text{g}/\text{l}$, respectively. All criteria are water hardness dependent. The values reported here are based on a water hardness of 100 mg/l as CaCO_3 (Federal Regulation 52FR6214). The State of Florida Surface Water Quality Standards for Class III Surface Waters, which are designated for recreation and the propagation and maintenance of fish and wildlife (Chapter 17-302, FAC), are lower than the Federal standards. Marine and freshwater values are 86 and 106 $\mu\text{g}/\text{l}$, respectively. The 106 $\mu\text{g}/\text{l}$ freshwater value is based on a water hardness of 100 mg/l as CaCO_3 .

5.2.3.2 Sediments For the purposes of developing guidelines for the evaluation of chemical analyses data on coastal and estuarine marine sediments in the National Status and Trends Program, the National Oceanographic and Atmospheric Administration (NOAA) gathered data from a wide variety of sediment evaluation methods. Data from three approaches for establishing ecological effects based sediment criteria were collected. These approaches were the equilibrium partitioning approach, the spiked-sediment bioassay approach, and various methods

Table 5-40
Concentrations of Chemicals of Concern in Sediments
SWMUs 2, 3, 4, 5, and 13
Ecological Assessment

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

	2-SD-4	2-SD-5	2-SD-6	2-SD-7	2-SD-7A	2-SD-8	2-SD-9	13-SD-3	B-SD-1	B-SD-2	B-SD-3	B-SD-DUP1
Organics (µg/kg)												
4,4'-DDD	< 1.3	6	< 2.3	1.3 J	< 1.5	< 1.2	2.6 J	2.8	< 1.1	< 1	< 7.4	< 1.6
4,4'-DDT	< 1.3	56	< 2.3	< 1.3	< 1.2	< 1.2	< 1	< 1.1	0.8 J	< 1	< 7.4	< 1.6
4,4'-DDE	< 1.3	< 3.3	3	3.4	4.1	< 1.2	1.5	2.4	3	< 1	< 7.4	< 1.6
Benzo[a]anthracene	61 J	81 J	< 940	< 520	< 490	< 520	< 410	< 430	< 440	< 430	< 610	< 650
Benzo[a]pyrene	59 J	74 J	< 940	< 520	< 490	< 520	< 410	< 430	< 440	< 430	< 610	< 650
Chrysene	94 J	130 J	< 940	< 520	< 490	< 520	65 J	< 430	< 440	< 430	< 610	< 650
Fluoranthene	110 J	< 690	< 940	< 520	< 490	< 520	150 J	< 430	< 440	< 430	< 610	< 650
Pentachlorophenol	< 2700	< 690	< 940	430 J	< 2400	< 2500	< 2000	< 2100	< 2100	< 2100	< 3000	< 3100
Phenanthrene	< 550	< 690	< 940	< 520	< 490	< 520	100 J	< 430	< 440	< 430	< 610	< 650
Pyrene	110 J	130 J	< 940	< 520	< 490	< 520	100 J	< 430	< 440	< 430	< 610	< 650
Metals (mg/kg)												
Copper	14.2	15.6	15.7	4 J	4.6 J	4.5 J	1.6 J	5.4 J	2 J	2.3 J	3.1 J	3.5 J
Lead	29.1	27.9	27.9	4.9 J	3.8 J	2.8	3.5 J	7.5 J	3.4	3	8.5	10
Mercury	0.39	0.11 J	< 0.18	< 0.1	< 0.044	R	< 0.048	< 0.076	< 0.078	< 0.068	< 0.15	< 0.13
Zinc	59.7	80.6	96.5	48.6 J	49.3 J	12.5 J	12 J	17.2 J	7.7	6.1	26.7	32.1

Table 5-40
Concentrations of Chemicals of Concern in Sediments
SWMUs 2, 3, 4, 5, and 13
Ecological Assessment

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Notes: R = rejected.
J = reported Value less than quantitation limit.

of evaluating synoptically collected biological and chemical data in field surveys. The chemical concentrations observed or predicted by the different methods to be associated with biological effects were sorted and the lower tenth percentile and median concentrations were identified along with an overall apparent effects threshold. The lower tenth percentile in the data is referred to as the Effects Range-Low (ER-L) and the median is referred to as an Effects Range-Median (ER-M). Table 5-41 summarizes the ER-L, ER-M, and threshold values, where available, for each COC in sediment. ER-L and ER-M values are not available for pentachlorophenol. Also included are "Pollution Classification Criteria" for each of the metals. These guidelines were developed for evaluation of Great Lakes Dredging Projects (Bahnick and others, 1981).

5.2.3.3 Polychlorinated Biphenyls (PCBs) in Soils Table 5-42 summarizes information on the toxicity of PCB Aroclors to avian and mammalian test species. Test results are reported as either the concentration of PCBs in the diet eliciting the adverse effect or the concentration of PCBs administered orally per unit of body weight (dose in mg/kg of body weight per day). Both acute and chronic dietary exposure limit criteria for mammals and birds are derived based on this information.

Acute dietary criteria for both mammals and birds were derived by taking one fifth of the dietary PCB concentration reported to cause 50 percent mortality in the test population (Table 5-43). An acute dietary dose criteria was derived if the test result is reported as a dose. Chronic dietary criteria or dietary dose criteria selected for both mammals and birds represent the lowest dietary PCB exposure concentration reported to cause adverse effects on reproduction, growth or survival.

Information available on the toxicity of PCBs in soils to terrestrial plants is included in Table 5-44. Concentrations of PCBs in soils reported to cause adverse effects to plants range from 1 mg/kg associated with decreased water usage in beets and soybeans (Weber and Mrozek, 1979; and Streck and others, 1981) to 1,000 mg/kg associated with malformation of new leaves in soybeans (Weber and Mrozek, 1979).

5.2.4 Aquatic Assessment The aquatic assessment consists of comparisons of the concentrations of COCs in surface water and sediments with AWQC and benchmark effects levels as identified in Sections 5.2.3.1 and 5.2.3.2, respectively. The results of the quantitative macroinvertebrate sampling (Section 4.4) are also discussed in comparison with the chemical data in Section 5.2.4.3.

5.2.4.1 Surface Water Zinc detected at 6 $\mu\text{g}/\text{l}$ at MPT-2-SW-8 and 34.4 $\mu\text{g}/\text{l}$ at MPT-2-SW-7 are lower than the marine and freshwater acute and chronic AWQC and the State of Florida marine and freshwater surface water criteria values.

Dissolved oxygen levels at all stations are within the State standard of greater than 5 mg/l. A pH of 6.26 measured onsite at MPT-2-SW-6 is slightly lower than the state standard of 6.5 to 8.5 (Chapter 17-302, FAC).

5.2.4.2 Sediments Ecological effects associated with COCs in sediments are evaluated by comparison of the benchmark concentrations in Table 5-41 with the concentrations measured in sediments at each location (Table 5-42). The results of the comparisons are summarized in Table 5-43. Concentrations of DDD, DDE,

**Table 5-41
Benchmark Concentrations for
Contaminants of Concern in Sediments
Ecological Assessment**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

	ER-L ¹	E-RM ²	Threshold ³	Great Lakes Pollution Classification ⁴	
Organics (µg/kg)					
4,4'-DDT	1	7	6		
4,4'-DDD	2	20	-		
4,4'-DDE	2	15	-		
Benzo(a)anthracene	230	1600	550		
Benzo(a)pyrene	400	2500	700		
Chrysene	400	2800	900		
Fluoranthene	600	3600	1000		
Pentachlorophenol	-	-	-		
Phenanthrene	220	1380	260		
Pyrene	350	2200	1000		
Metals (mg/kg)					
				Non-Polluted	Heavily Polluted
Copper	70	390	300	< 25	> 50
Lead	35	110	300	< 40	> 60
Mercury	0.15	1.3	1	< 1	> 1
Zinc	120	270	260	< 90	> 200
¹ ER-L = Effect Range-Low or Lower 10 percentile in data set of concentrations observed or predicted by different methods to be associated with biological effects (Long & Morgan, 1990). ² ER-M = Effect Range-Median or Median concentration of data set (Long & Morgan, 1990). ³ Threshold = Subjectively determined concentration above which biological effects are usually or always observed (Long & Morgan, 1990). ⁴ Bahnick et al., 1981.					

Table 5-42
Reported Toxicity of PCBs to Terrestrial Plants and Wildlife
and Selection of Dietary Exposure Criteria
Ecological Assessment

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Avoclor	Species	Duration	Result	Exposure	Reference
Chronic Avian Studies					
1254	American Kestrel	69 days	Reduced sperm concentration	LOEL of 9 mg/kgBW/day	Eisler, 1986
1254	Ring Doves and Mourning Doves	6 weeks	Abnormal courtship behavior	10 mg/kg in diet	Peakall & Peakall, 1973; Tori & Peterle, 1983; Koval et al., 1987
1254	Mourning Dove	42 days	Reduced metabolic rates and body temperatures	40 mg/kg in diet	Tori & Mayer, 1981
Mixture	Chickens	NS	Reproductive Impairment	LOEL of 5 mg/kg in diet, NOAEL of 2 mg/kg in diet	Eisler, 1986
1254	American Kestrel		Embryonic mortality and disruption of courtship and nesting behavior	10 mg/kg in diet	Lincer, 1971
1250	Pheasant		Reduction in egg production and offspring survival	50 mg/kg in diet	Dahlgren & Linder, 1971
1254	Mallards	5-6 months	No effects	Effects not observed at 25 to 40 mg/kg in diet	USEPA, 1976
1254	Bobwhite Quail	12 weeks	No effects	50 mg/kg in diet	USEPA, 1976
1254	Ring Doves	Two generations	95% embryonic mortality in second generation	10 mg/kg in diet	Peakall et al. 1972

See note at end of table.

Table 5-42 (Continued)
Reported Toxicity of PCBs to Terrestrial Plants and Wildlife
and Selection of Dietary Exposure Criteria
Ecological Assessment

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Acroior	Species	Duration	Result	Exposure	Reference
Acute Avian Studies					
1260	Bobwhite Quail	5 days treated plus 3 days	LD50	747 mg/kg in diet	Eisler, 1986
1260	Mallard	5 days treated plus 3 days	LD50	1975 mg/kg in diet	Eisler, 1986
1260	Ring-necked Pheasant	same	LD50	1,260 mg/kg in diet	Eisler, 1986
1260	European starling	4 days	LD50	1,500 mg/kg in diet	Eisler, 1986
1254	Red-winged blackbird	6 days	LD50	1,500 mg/kg in diet	Eisler, 1986
1254	Brown-headed cowbird	7 days	LD50	1,500 mg/kg in diet	Eisler, 1986
Acute Mammalian Studies					
1260	Rat	Single oral dose	LD50	1,300 - 10,000 mg/kgBW	Eisler, 1986
1254	Mink	Single oral dose	LD50	4,000 mg/kgBW	Eisler, 1986

See notes at end of table

Table 5-42 (Continued)
Reported Toxicity of PCBs to Terrestrial Plants and Wildlife
and Selection of Dietary Exposure Criteria
Ecological Assessment

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Aroclor	Species	Duration	Result	Exposure	Reference
Chronic Mammalian Studies					
1242	Mink	9 months	LD50	8.6 mg/kg in diet	Eisler, 1986
1254	Mink	9 months	LD50	6.7 mg/kg in diet	Eisler, 1986
1254	Mink	8 months	Reproductive failure	2.0 mg/kg in diet	Eisler, 1986
1254	Mink	4 months	Reproductive failure	5.0 mg/kg in diet	Eisler, 1986
1254	Mink	4 months	No effects	1.0 mg/kg in diet	Eisler, 1986
1254	Mink	NS	Reproductive failure	0.64 mg/kg in diet	Eisler, 1986
1242	European Ferret	9 months	Reproductive failure	20 mg/kg in diet	Eisler, 1986
Plant Studies					
1254	Soybeans		12% Decreased water usage	1 mg/kg in soil	Weber & Mrozek, 1979
			2% Decreased water usage	20 mg/kg in soil	
			52% Decreased water usage	1,000 mg/kg in soil	
			Malformation of new leaves	1,000 mg/kg in soil	
1254	Pigweed		Reduced fresh weight	100 mg/kg in soil	Strek et al., 1980
1254	Corn		No reduction in freshweight	100 mg/kg in soil	Strek et al., 1981
1254	Sorghum		No reduction in freshweight	100 mg/kg in soil	Strek et al., 1981
1254	Beets		5% Reduction in cumulative water use	1 mg/kg in soil	Strek et al., 1981
1254	Beets		96% Reduction in cumulative water use	1,000 mg/kg in soil	Strek et al., 1981
1254	Spinach		Oxygen evolution reduced in chloroplasts	20 mg/kg in soil	Sinclair et al., 1977
Selected Exposure Criteria					
				Avian	Mammalian
	Acute Dietary Criteria (mg of PCB per kg of diet)	149		260	
	Acute Oral Dose Criteria (mg of PCB per kg of Body Weight)	-		-	
	Chronic Dietary Criteria (mg of PCB per kg of diet)	10		0.64	
	Chronic Oral Dose Criteria (mg of PCB per kg of Body Weight)	9		-	
	Note: NS = not stated.				

**Table 5-43
Comparison of Sediment Concentrations with Benchmarks
Ecological Assessment**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

	4,4'-DDD	4,4'-DDE	4,4'-DDT	Mercury
MPT-2-SD-4				X
MPT-2-SD-5	X		X	
MPT-2-SD-6		X		
MPT-2-SD-7	X	X		
MPT-2-SD-9	X	X		
MPT-13-SD-2	X	X		
MPT-B-SD-1		X		

Notes: DDD = dichlorophenyl dichloroethane.
DDE = dichlorophenyl dichloroethylene.
DDT = dichlorophenyl trichloroethane.
X = concentration measured in sample exceeds one of the benchmark concentrations in Table 5-41.

Table 5-44
Exposure Parameters for Representative Terrestrial Species
Ecological Assessment

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Receptor	Body Weight (g)	Reported Diet	Soil Ingestion (% of diet)	Assumed Diet for Exposure Assessment	Food Ingestion Rate (kg/day)	Home Range (acres)	Density (N/acre)
American Robin (<i>Turdus migratorius</i>)	¹ 77.3 ± 0.36	7% Fruits ² 93% Invertebrates	³ 9.1	14% Invertebrates 69.9% Earthworms 7.0% Fruits 9.1% Soil	⁴ 0.0189	⁵ 1.04	⁶ 1.6
Kestrel (<i>Falco sparverius</i>)	⁶ 103 ± 6.7	32.6% Invertebrates ⁷ 31.7% Mammals 30.3% Birds 1.9% Reptiles 3.5% Other	⁸ 5	50% Invertebrates 23% Mammals 22% Birds 5% Soil	0.013 ⁴	Male 32.37 ⁸ Female 78.1	0.001 nest/acre ⁹
Short-Tailed Shrew (<i>Blarina brevicauda</i>)	¹⁰ 18	31.4% Earthworms ¹¹ 27.1% Slugs & snails 8.1% Misc. animals 7.7% Fungi 12% Insects 5.6% Other 5.4% Vegetation	⁹ 1 ³	31.4% Earthworms 47.2% Invertebrates 12.3% Vegetation 9.1% Soil	0.49 g/g. day ¹²	¹³ 1	¹² 25
Longtail Weasel (<i>Mustela frenata</i>)	198 - 340 g ¹³ (males) 85 - 198 g (females)	Small mammals ¹³ and a few birds	² 2.8	10% Bird 87.2% Mammals 2.8% Soil	¹⁴ 9.1 x 10 ⁻³	¹³ 30 - 40	¹³ 1.09

¹Dunning, 1984.

²Spring diet reported in Wheelright (1986).

³Soil ingestion assumed for Kestrel. Robin and shrew values based on soil ingestion for woodcock reported by Beyer et al. (1991) as the woodcock also feeds primarily soil invertebrates (earthworms). Longtail weasel value based on % reported for fox. Beyer et al. (1991).

⁴By equation based on body weight (Wt.) in kg. Food Ingestion(kg/day) = 0.0582 x Wt.^{0.681}. Nagy (1987).

⁵Pitts, 1984.

⁶Mean fall weight reported in Bloom (1973).

⁷Winter diet presented in Meyer & Balgooyen (1987). Consumes large insects (grasshoppers) as primary prey in summer.

⁸Winter weight reported in Mills (1975).

⁹Density reported for urban areas in Toland & Elder (1987).

¹⁰Lomolino (1984).

¹¹Whitaker & Ferraro (1983).

¹²Barrett & Stueck (1976).

¹³Burt and Grossenhelder (1976).

¹⁴By equation based on body weight (Wt.) in kg. Food Ingestion (kg/day) = 0.0687 x Wt.^{0.822}. Nagy (1987).

DDT, and mercury exceed benchmark levels. Exceedance of the benchmark concentrations indicates that adverse ecological effects are possible. Further site specific evaluations would be necessary to identify the nature and extent of the effects.

DDD, DDE, and DDT are detected at consistent concentrations (from 1.5 to 4.1 $\mu\text{g}/\text{kg}$) with the highest concentrations (6 $\mu\text{g}/\text{kg}$ of DDD and 56 $\mu\text{g}/\text{kg}$ of DDT) detected at MPT-2-SD-5. Concentrations of DDT, DDD and DDE measured at all stations exceed the 1 to 2 $\mu\text{g}/\text{kg}$ ER-L's (Table 5-40) with only the DDT concentration measured at MPT-2-SD-4 exceeding the ER-M. There is no obvious contamination gradient for DDT, DDD, or DDE. The concentrations measured in the study area stations are within the range of concentrations measured in background sediments. DDD, DDE, and DDT contamination of sediments may reflect past general use of the chemical as an insecticide rather than represent migration of contamination from the SWMUs.

The actual toxicity (and risk) presented by the DDT contamination measured at MPT-2-SD-5 is difficult to predict based upon comparisons with the literature information. Exposures and sensitivities of the exposed organisms will be different than those for which the test results are reported. Actual exposures to DDT may be higher or lower based upon many factors including but not limited to the extent of the chemical contamination in the sediments and the organic carbon content of the sediments.

The DDT (and metabolites) contamination do not appear to be emanating from sources at any of the SWMUs as DDT and DDE were both detected in upstream samples. Thus, the concentrations of DDT, DDD, and DDE measured do not reflect a contamination gradient. The present concentrations also do not seem to be affecting the macroinvertebrate community in a gross manner. The results of the quantitative macroinvertebrate sampling do not show any striking changes in benthic macroinvertebrate community structure or function.

Mercury was detected at two locations (MPT-2-SD-4 and MPT-2-SD-5) with one exceeding the sediment benchmark concentrations. The mercury concentration of 0.39 mg/kg at MPT-2-SD-4 is higher than the ER-L of 0.15 but not the ER-M of 1.3 mg/kg.

Assessment of potential ecological effects associated with pentachlorophenol in sediments is not possible as exposure limit criteria were unavailable. Pentachlorophenol was detected in one of eight sediment samples at MPT-2-SD-7 at a concentration of 430 $\mu\text{g}/\text{kg}$. It was not, however, detected in the duplicate sample (MPT-2-SD-7A) from that location.

5.2.4.3 Quantitative Biological Survey Information The surface water assessment (Section 5.2.4.1) and sediment assessment (Section 5.2.4.2) collectively indicate potential for ecological effects at seven sampling stations (MPT-2-SD-4, MPT-2-SD-5, MPT-2-SD-6, MPT-2-SD-7, MPT-2-SD-9, and MPT-13-SD-2), including one background location (MPT-13-SD-1). These predictions are, however, very uncertain and should be considered in relation to actual field measurements of impact to benthic macroinvertebrate communities. This type of assessment provides for a "weight of evidence" approach in determining if ecological effects are occurring onsite and if they are associated with chemical contamination.

The quantitative benthic macroinvertebrate sampling results (Section 4.4) indicate reduced benthic macroinvertebrate species diversity at MPT-2-BIO-8 and

MPT-2-BIO-9 (corresponding to surface water and sediment sampling locations MPT-2-SW/SD-8 and MPT-2-SW/SD-9). Samples from these locations have species diversity (Shannon Weaver Index) less than 75 percent of that at the background (MPT-B-BIO-2) location, the communities (type of taxa) are dissimilar from the background locations with Community Loss Index values of 1.54 and 2.0, mollusc species are absent at MPT-2-BIO-9, and the number of taxa (11 and 9, respectively) are less than the background (22 taxa). Effects may also be occurring at MPT-2-BIO-5 and MPT-2-BIO-2 where community similarity indices are greater than 1 indicating communities dissimilar from the background.

Both forms of assessment (comparison of measured contaminant concentrations with benchmarks and quantitative benthic macroinvertebrate sample analyses) predict adverse ecological effects at MPT-2-BIO-5 (or MPT-2-SW/SD-5) and MPT-2-BIO-9 (or MPT-SW/SD-9). The sediment assessment indicates possible ecological effects associated with DDD and DDE in sediments at MPT-2-BIO-9 (MPT-2-SW/SD-9), and DDD and DDT at MPT-2-BIO-5 (MPT-2-SW/SD-5).

5.2.4.4 Summary of Aquatic Assessment The sediment assessment indicates potential for adverse ecological effects at seven study locations and one background location. Potential effects at five of the study stations (MPT-2-SD-5, -2-SD-6, -2-SD-7, -2-SD-9, and -13-SD-2) are associated solely with DDD, DDT, or DDE. DDT, DDD, and DDE in sediments do not follow a contamination gradient and may not be associated with waste disposal practices at the SWMUs. Effects predicted at the station MPT-2-SD-4 are associated with mercury.

Interpretation of the quantitative benthic macroinvertebrate sampling results (Section 4.4) indicate benthic communities appear to have been subjected to adverse impact at MPT-2-BIO-5, -2-BIO-8, -2-BIO-9, and -2-BIO-2. Both forms of ecological assessment (comparison of chemical concentrations with benchmarks and the quantitative benthic macroinvertebrate survey) suggest effects at MPT-2-BIO-5, MPT-2-BIO-9, and MPT-2-BIO-8. These sampling locations are located near SWMUs 4 and 5 indicating that these SWMUs may be adversely affecting the aquatic communities in the ditch.

Specific recommendations regarding Corrective Measures Studies to mitigate effects of contaminated sediments would require more site specific information on bioavailability and toxicity of the chemical contamination. Further monitoring of chemical contamination in the drainage ditches near SWMUs 4 and 5 is recommended to determine the extent of mercury and DDT (and metabolites) contamination. The sources of mercury and pentachlorophenol contamination have not been identified. DDT, DDD, and DDE contamination may represent past use of the chemicals as insecticides and not migration of contamination from SWMUs 2, 3, 4, and 5.

5.2.5 Terrestrial Assessment Evaluation of risks for terrestrial wildlife resulting from exposures to PCBs in soils includes selection of representative terrestrial species (Section 5.2.5.1), estimation of PCB exposure concentrations for the species via direct soil ingestion and the diet (Section 5.2.5.2) and comparison of the exposure concentrations with acute and chronic dietary criteria or doses (Section 5.2.5.3).

5.2.5.1 Selection of Representative Terrestrial Species Habitats present on and around the SWMU 2 PCB site include ruderal lands and pine plantations (Figure 4-9 and Figure 3-5). Developed lands with no habitat potential include bordering roads on the east and south, a parking lot to the east, and SWMU 2 to the south.

Habitat present on the SWMU 2 PCB site is limited as the land is ruderal with natural vegetation having been removed or altered. Most of the site area is mowed grass. Pine plantations lie to the north with a small cluster to the west of the soil sampling grid. Vegetation within the pine plantations includes various shrubs, cabbage palm (*Sabal palmetto*), and slash pine (*Pinus elliottii*). Wildlife species that commonly inhabit developed and ruderal areas of NAVSTA Mayport are mourning dove (*Zenaida macroura*), rock dove (*Columbia livia*), cattle egret (*Bubulcus ibis*), meadowlark (*Sturnella Magna*), blue jay (*Cyanocitta cristata*), fish crow (*Cornus ossifragus*), northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and gray squirrel (*Sciurus carolinensis*). Slash pine plantations generally have low plant and wildlife species diversity.

As it is not practical to assess PCB exposures and risks for all wildlife species that may inhabit the PCB site, representative terrestrial wildlife species were chosen for evaluation. Representative species were selected according to trophic status to represent other organisms of similar trophic positions. The organisms expected to receive the highest exposures of PCBs are insectivorous and carnivorous mammals and birds.

PCBs are not readily transported from soils to plants but they are accumulated by soil dwelling invertebrates. Dierxcsens, et al. (1985) examined the concentration of PCBs in tissues of earthworms living in soils contaminated with PCB congeners that represented a mix of Aroclors 1242, 1254, and 1260. PCB concentrations (mg/kg fresh weight) averaged 5.82 times that of PCB concentrations (mg/kg dry weight) in soils in which the worms were living. Earthworms are widespread and abundant in soils and comprise the majority of the biomass of soil-dwelling invertebrates. Earthworms feature in the diet of hundreds of species of terrestrial insectivores and for some of them is seasonally the principal food (MacDonald, 1983). Information is not available on the potential accumulation of PCBs in soils by other soil dwelling invertebrates such as nematodes, arthropods (spiders), isopods (pill bugs), coleopterans (beetles) and orthopterans (crickets and grasshoppers). Accumulation of PCBs from soils by soil invertebrates other than earthworms is possible, as bioaccumulation of a related chemical (TCDD) by terrestrial arthropods is reported at one half of the soil concentrations (Bartelson and others, 1985).

PCBs are documented to accumulate in adipose tissue and organ tissues of mammals and birds fed PCBs in the diet (Hornshaw et al., 1983; and Lincer and Peakall, 1973). Upper trophic level carnivores that feed on the contaminated animal tissue may be exposed to higher PCB concentrations in the diet than those for the insectivores. Both insectivores and carnivores were chosen as representative terrestrial wildlife species.

One small insectivorous mammal (the short-tailed shrew) and bird (the American robin) with home ranges approaching the areal extent of the PCB soil contamination were selected. Selecting species with small body sizes and home ranges provides for protection of species that would be expected to encounter the highest doses of PCBs and the highest frequencies of exposure. A carnivorous mammal (the long-tail weasel) was selected to represent upper level carnivores and the kestrel was selected as representative of a species feeding on both terrestrial invertebrates and small mammals or birds. The selected representative species are species that may inhabit the ruderal and pine plantation habitats on or near the area of PCB soil contamination.

REFERENCES (Continued)

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS. The Phase 1 RCRA Facility Investigations at NAVSTA Mayport did not find evidence of release of Appendix IX Groundwater Monitoring List chemicals from SWMUs located in the Group I area, with the following exceptions.

- PCBs were found above human and environmental risk-based action levels in surface soils near SWMU 2.
- Random detection of volatile and semivolatile organic compounds near quantitation limits were found in groundwater, surface water, or soil samples. Primary drinking water standards, environmental risk-based levels, or risk-based human health levels were not exceeded for these organic compounds. Arsenic, however, was detected above risk-based levels in both soil and groundwater.
- Sediment samples near SWMUs 4 and 5 had detectable levels of polynuclear aromatic hydrocarbons (PAH) not observed in background samples. Two of these sediment samples near SWMU 5 also had detectable levels of mercury near quantitation limits. Pentachlorophenol was reported near quantitation limits for one of these two samples. The duplicate of this sample did not report pentachlorophenol. DDT, DDD, and DDE were also found in sediment samples. The ecological assessment predicted potential ecological effects due to contaminants in sediments.

6.2 RECOMMENDATIONS. A Corrective Measure Study is not recommended for the Group I SWMUs. Field and laboratory data do not indicate release of contamination from the Group I SWMUs that would warrant a Corrective Measures Study. Data does identify areas, however, where interim measures and additional investigation are recommended.

- Soil contaminated with PCBs at SWMU 2 should be delineated and removed for treatment and disposal. Residual contamination below cleanup levels should be covered with clean fill or other engineered controls.
- An additional round of groundwater samples from the Group I monitoring wells should be collected. These samples should be analyzed for a subset of the Appendix IX Groundwater Monitoring List chemicals based on Phase 1 findings. Although general water quality in the surficial aquifer prevents potable use of groundwater, an additional sampling round will help confirm whether or not the observed chemicals in groundwater are random occurrences, or indicate a release from the Group I SWMUs.
- Additional sediment samples upstream of locations MPT-2-SD-4, MPT-2-SD-5, and MPT-2-SD-9 should be collected to confirm if the source of PAH, pentachlorophenol, DDT (and by-products), and mercury are from SWMUs 4 and 5.
- Because of the low concentrations and frequency of detection of chemicals in soils, groundwater, and sediments, it is recommended that more background samples be collected during Phase 2. The specific number of background samples will be proposed in an addendum to the Workplan. In particular, the range of background concentrations for arsenic in groundwater and soils should be determined for the Mayport area.

All acute hazard indices are less than one and do not indicate mortality for any of the species evaluated related to short term exposures to PCBs. Chronic effects are predicted for the shrew, robin, and weasel. Small insectivorous birds such as the robin are potentially at greatest risk. Terrestrial plants growing in soils with PCB concentrations greater than 1 mg/kg may exhibit sublethal effects such as decreased water usage and leaf malformations.

5.2.5.4 Uncertainty Analyses The uncertainties of the approach used for assessing risks to terrestrial wildlife are associated with the assumptions used in evaluating PCB exposures and toxicity. The assumptions made are based upon the best available information from the literature. Actual exposures in the field may be higher or lower. For example, PCB exposures for insectivorous in the diet are estimated, in part, based upon the reported accumulation of PCBs into earthworm tissues. It is assumed that all earthworms are exposed to a mean PCB concentration of 16.7 mg/kg. Actual exposures for the worms may be higher or lower depending upon the PCB soil concentrations for the particular location.

Uncertainty is also associated with the applicability of using laboratory toxicity information to evaluate effects for wildlife species. Toxicity testing information is very limited for wildlife species. It is often necessary to extrapolate the information available for a related species to the species of concern. To minimize uncertainty, avian laboratory toxicity data was used to evaluate effects for the robin and kestrel, and mammalian data was used to evaluate potential effects to the shrew and weasel. The exposure criteria selected were conservative as the lowest reported concentrations eliciting effects were selected and used in the assessment. This type of assessment would protect sensitive species, but may be overprotective of less sensitive species. For example, the mink is the most sensitive of the animals exposed to PCBs in toxicity testing studies. The chronic exposure criteria derived for mammals are based on mink data and may be overly conservative for other mammalian species. If mink toxicity information is not considered, the assessment and toxicity information available for the ferret is used instead; then weasel would not be predicted to be at risk.

5.2.6 Summary of Ecological Assessment

5.2.6.1 Summary of Aquatic Assessment The surface water assessment does not indicate potential for ecological effects associated with zinc.

The sediment assessment indicates potential for adverse ecological effects at seven study locations and one background location. Potential effects at four of the study stations (MPT-2-SD-4, -SD-5, -SD-6, SD-9, and -13-SD-2) and one background station (MPT-B-SD-1) are associated solely with DDD, DDT or DDE. Effects at station MPT-2-SD-4 are associated with mercury. DDT, DDD and DDE in sediments do not follow a contamination gradient and may not be associated with waste disposal practices at the SWMUs. Interpretation of the quantitative benthic macroinvertebrate sampling results indicate potentially impacted benthic communities at MPT-2-BIO-5, -2-BIO-8, -2-BIO-9 and -2-BIO-2.

Both forms of ecological assessment (comparison of chemical concentrations with benchmarks and the quantitative benthic macroinvertebrate survey) predict risks at MPT-2-BIO-5, MPT-2-BIO-9, and MPT-2-BIO-8. These areas may require further biological sampling and chemical analyses to determine if SWMU 4 and SWMU 5 are impacting the drainage ditches.

Recommendations regarding clean up of contaminated sediments would require more site specific information on bioavailability and toxicity of the chemical contamination. Further monitoring of chemical contamination in the drainage ditches is recommended to determine the extent of mercury and DDT (and metabolites) contamination.

5.2.6.2 Summary of Terrestrial Assessment: Chronic toxic effects associated with PCB exposures are predicted for small avian and mammalian insectivorous and upper trophic level carnivores. Based on the magnitude of the hazard indices, insectivorous birds, such as the robin, are at greatest risk. Mortality related to short-term exposures to PCBs are not indicated. Terrestrial plants growing in soils at the site with PCB concentrations greater than 1 mg/kg may exhibit sublethal effects, such as decreased water usage and leaf malformations.

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PCB concentrations were lower in the 6 to 12 inch interval samples at a mean concentration of 3.61 mg/kg. The mean concentration for the 0 to 6 inch interval was selected for use in determining exposures for terrestrial receptors. This is the depth interval that has the most biological activity and represents the soils terrestrial wildlife are the most likely to encounter.

PCB concentrations in prey items of the representative terrestrial species are estimated based upon bioaccumulation factors (BAF) reported in the literature (Table 5-45). PCB concentrations in earthworms are estimated to be 97 mg/kg (Table 5-45) based upon the 5.82 BAF reported by Diercxsens and others (1985). PCB concentrations in other soil invertebrates are estimated to be 8.4 mg/kg based on a bioaccumulation value reported for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) by Bartelson and others (1985). Concentrations of PCBs in the tissues of small birds is estimated to be 238 mg/kg based the reported bioaccumulation of PCBs from the diet to muscle tissue (Lincer and Peakall, 1973) and the predicted chronic dietary exposure of 14 mg/kg for the American robin (Table 5-46). PCBs in mammalian tissue are estimated to be 180 mg/kg based on a BAF reported for accumulation of PCBs from the diet to adipose tissue in mink (Hornshaw and others, 1983) and the chronic dietary exposure of PCBs for the short tailed shrew (Table 5-47).

Dietary PCB exposures for each representative species are calculated based upon the estimated concentration of PCBs in a prey item (Table 5-45) and the percentage of the prey (Table 5-44) item in the diet (Table 5-46). Long-term or chronic dietary PCB exposures are based on the predicted concentration of PCBs in the diet times a site foraging frequency (SFF) factor. The SFF is the areal extent of PCB contamination divided by the home range of the animal and cannot be greater than one. This factor allows for consideration of the time the animal will likely spend foraging in the area of soil contamination. The factor is not used to evaluate acute exposures (one time or short term). Acute and chronic PCB doses are also calculated by multiplying the respective dietary exposures by the food ingestion rate and dividing by the body weight of the animal (Table 5-46).

Predicted acute PCB dietary exposures are highest for the longtail weasel and kestrel. Chronic dietary exposures for these animals are however much lower (1.2 and 0.61 mg PCB/kg diet, respectively). Chronic exposures for the robin and short-tailed shrew are 14 and 7.2 mg PCB/kg diet, respectively. The lower chronic exposures for the weasel and kestrel are due to the assumption that both animals will forage over a much larger area than the shrew and robin and are less likely to be exposed. Acute PCB doses are predicted to be similar for all species ranging from 13 mg/kgBW/day for the kestrel to 19 mg/kgBW/day for the longtail weasel (Table 5-46). Chronic doses are much lower for the kestrel and weasel (0.08 and 0.13 mg/kgBW/day) than for the shrew and robin (3.4 mg/kgBW/day) (Table 5-46).

5.2.5.3 Evaluation of Risks Acute and chronic dietary PCB exposures (Table 5-45) are compared with acute and chronic dietary PCB criteria (Table 5-42) to determine acute and chronic hazard indices (HIs) for each species (Table 5-46). Respective dietary doses are also compared with oral dose criteria to calculate a separate set of acute and chronic HIs. Acute indices greater than one indicate that exposures may exceed those reported to cause mortality. Chronic indices greater than one indicate the potential for PCB exposures to result in adverse effects on reproduction, survival, or growth.

Table 5-46
Evaluation of Hazards for Representative Terrestrial Species
Ecological Assessment

Phase 1 PCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Receptor	Acute Dietary PCB Exposure (mg/kg diet) ¹	Site Foraging Frequency (Site area/Home Range)	Chronic Dietary PCB Exposure (mg/kg diet) ²	Acute Hazard Index ³	Chronic Hazard Index ⁴	Acute PCB Dose (mg/kgBW/day) ⁵	Chronic PCB Dose (mg/kgBW/day) ⁶	Acute Hazard Index ⁷	Chronic Hazard Index ⁸
Short-tailed Shrew	38	0.2	7.2	-	5.11	17	3.4	0.07	-
American Robin	82	0.2	14	0.47	1.4	17	3.4	-	0.38
Keestrel	106	0.006	0.61	0.66	0.06	13	0.88	-	0.008
Longtail Weasel	183	0.007	1.2	-	1.9	19	0.13	0.07	-

¹Acute Dietary PCB Exposure (mg, PCB/kg diet) = sum [(% prey) x (prey tissue concentration)]
 Where: % Prey is from Table 5-21 and Prey Tissue Concentrations are from Table 5-22.

²Chronic Dietary PCB Exposure (mg/kg) = Acute Dietary PCB Exposure x SFF; Site Area = 0.2 acres and SFF cannot exceed 1.

³Acute Hazard Index = $\frac{\text{Acute Dietary PCB Exposure (mg/kg)}}{\text{Acute Dietary Criteria (mg/kg) from Table 5-19}}$

⁴Chronic Hazard Index = $\frac{\text{Chronic Dietary PCB Exposure (mg/kg)}}{\text{Chronic Dietary Criteria (mg/kg) from Table 5-19}}$

⁵Acute PCB Dose = Acute Dietary Exposure (mg/kg) x Food Ingestion Rate (mg/kg) x 1/Body Weight (kg). (Table 5-21)

⁶Chronic PCB Dose (mg/kg) = Chronic Dietary Exposure x Food Ingestion Rate (mg/kg) x 1/Body Weight (kg). (Table 5-21)

⁷Acute Hazard Index = $\frac{\text{Acute PCB Dose (mg/kgBW/day)}}{\text{Acute Oral Dose Criteria (mg/kgBW/day) from Table 5-19}}$

⁸Chronic Hazard Index = $\frac{\text{Chronic PCB Dose (mg/kgBW/day)}}{\text{Chronic Oral Dose Criteria (mg/kgBW/day) from Table 5-19}}$

American Robin. Thrushes are common, medium-sized birds that eat worms, insects and fruit. All except bluebirds build nests of mud and vegetation in the crotches of trees or shrubs and forage primarily on the ground by probing and gleaning. The robin (*Turdus migratorius*) forages by walking along the ground and is an important predator of earthworms and soil-dwelling invertebrates. It is common throughout most of the United States in open woodlands, orchards, and suburban lawns, parks, and fields. It prefers moist woods or fruit-bearing trees in cold weather. Robins feed mainly on worms but switch to fruits when they are plentiful in fall and winter. Typically their diet consists of 7 percent fruits and 93 percent invertebrates (Wheelright, 1986). Composition of the diet as soil is estimated to be 9.1 percent based on a reported value for the woodcock that also feed mainly on earthworms (Beyer and others, 1991). For the purposes of estimating the consumption of prey items by the robin in this assessment, the diet is assumed to consist of 14 percent invertebrates, 69.9 percent earthworms, 9.1 percent soils and 7.0 percent fruits (Table 5-44).

Short-tailed Shrew. The short-tailed shrew (*Blarina brevicauda*) inhabits a wide variety of habitats and is common in areas with abundant vegetative cover (Miller and Getz, 1967, as cited in George and others, 1986). The short-tailed shrew is primarily carnivorous consuming earthworms or millipeds as the primary food source (Mumford and Whitaker, 1982). The shrew would be expected to inhabit areas of the pine woodland that have vegetative cover (understory).

Longtail Weasel. The longtail is found in all land habitats. It feeds primarily on small mammals and occasionally small birds (Burt and Grossenheider, 1976). The weasel is in the same family as the mink, which is the wildlife species most sensitive to toxic effects associated with PCBs. Mink are not expected to be in the area of the PCB soil contamination as there is not suitable habitat present. Mink occupy habitats along stream or lake banks (Burt and Grossenheider, 1976).

Kestrel. The southeastern kestrel (*Falco sparverius*) is a small falcon inhabiting open pine forests, clearings, and open areas along rivers, coasts, and urban areas. The kestrel feeds primarily on insects but also preys upon rodents, reptiles, and small birds (Meyer and Balgooyen, 1987). This subspecies breeds throughout Florida and nests in abandoned woodpecker cavities or other similar structures. The southeastern kestrel would be expected to inhabit forested areas where dead trees are available for roosting and nesting.

In order to estimate PCB exposures for the representative species, certain exposure parameters are collected in Table 5-45. Parameters include body weight, reported diet, reported soil ingestion as a percentage of the diet, food ingestion rate, home range, and density. For the purposes of estimating exposures for the receptors to contaminated food, percentages of prey items in the diet were assumed based upon the reported diets of the respective species.

5.2.5.2 PCB Exposures for Representative Species Soil samples collected at 10-foot intervals at depths of 0 to 6 inches and 6 to 12 inches within a 4,000-square-foot area were screened for PCBs using a field procedure (Figure 4-9). Twenty-one samples with positive field screening results were analyzed in the laboratory. The mean PCB concentration measured in soil samples from 0 to 6 inches is 16.7 mg/kg with concentrations ranging from 0.23 mg/kg to 120 mg/kg.

Table 5-45
Estimation of PCB Concentrations in Prey Items
Ecological Assessment

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Jacksonville

Prey Item	Exposure Concentration (mg/kg)		Bioaccumulation Factor (BAF)		Estimated Concentration of PCBs in Prey Item (mg/kg)
Earthworms	16.7 in soils	x	¹ 5.8	=	97
Terrestrial Arthropods	16.7 in soils	x	² 0.5	=	8.4
Small Mammals (Adipose Tissue)	³ 7.2 in diet	x	⁴ 25	=	180
Small Birds (Muscle)	⁵ 14 in diet	x	⁶ 17	=	238

¹BAF reported in Diercxsens et al. (1985).

²BAF for terrestrial arthropods based on value reported for TCDD (2, 3, 7, 8-tetrachlorodibenzo-p-dioxin) by Bartelson et al. (1985).

³Dietary exposure for the Short-tailed Shrew (Table 5-46).

⁴BAF reported for adipose tissue in mink (Homshaw et al., [1983]).

⁵Dietary exposure for the robin (Table 5-46).

⁶BAF calculated based on information reported in Lincer and Peakall (1973).

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APPENDIX A

BORING LOGS (GTGS BORING LOGS)

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-1-1	BORING NO. MPT-1-1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/9/87	COMPLTD: 9/9/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-15'	PROTECTION LEVEL: D
TOC ELEV.: 17.01 FT.	MONITOR INST.: Hnu	TOT DPTH: 15FT.	DPTH TO ∇ 7 FT.
LOGGED BY: R. M. Nugent	WELL DEVELOPMENT DATE: 9/8/87		SITE: #1,

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
	SS1	1 1/2'	3.3	Sand-fine to coarse, brown, moist, some organic matter	[Dotted pattern]	SP	3,7,18,18	[Well data diagram]
	SS2	1 1/2'	3.0	Sand-as above, gray with some shell fragments		SP	2,21,28,30	
	SS3	1 1/2'	8.5	Sand-as above, 2" brown layer at 1.2' of spoon		SP	9,18,23,29	
5	SS4	1 1/2'	2.8	Sand-fine, dark brown, moist		SP	10,11,8,9	
	SS5	1/2'	7.2	Sand-fine to medium, gray, some shell fragments		CL SP	7,7,18,18	
	SS6	2/2'	3.5	Sand-as above		SP	5,29,50,+	
10				Clay-stiff, saturated at bottom				
15				Sand-light tan to gray, saturated, small shell fragments				
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL.q		LOG of WELL: MPT-1-2	BORING NO. MPT-1-2
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 5097-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 10/9/87	COMPLTD: 10/9/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-15'	PROTECTION LEVEL: D
TOC ELEV.: 18.93 FT.	MONITOR INST: Hnu	TOT DPTH: 15.0 FT.	DPTH TO ∇ 5.00 FT.
LOGGED BY: R. M. Nugent	WELL DEVELOPMENT DATE: 10/10/87	SITE: #1,	

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0.0	SS1	1.3/2'	10.0	Fill-gravel, dark brown, moist		SP	22,22,37,31	
5.0	SS2	1.3/2'	4.8	Sand-fine, lt. brown to lt. gray, moist, few shell fragments			24,25,17,22	
10.0	SS3	2.0/2'	13.5	Sand-fine, brown to gray, saturated, few shell fragments, with a 0.4' fine clay layer, dark gray, saturated, high plasticity		CL SP	8,2	
15.0	SS4	2.0/2'	2.8	Sand-fine, light grey, few shells and shell fragments, saturated			12,32,51+	

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT1-P1	BORING NO. MPT1-P1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 5-10'	PROTECTION LEVEL: 0
TOC ELEV.: 7.11 FT.	MONITOR INST.: OVA	TOT DPTH: 10 FT.	DPTH TO ∇ 5.00 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: N/A		SITE: #1

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0					SAND-very fine to medium, lt.brown w/ abundance of shell fragments		SP		
5			2/2	N/A	SAND-as above, saturated below 5'			8,8,8,7	
10									
15									
20									
25									
30									

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT1-P2	BORING NO. MPT1-P2
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-61	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 10-15'	PROTECTION LEVEL: D
TOT ELEV.: 11.77 FT.	MONITOR INST.: FID	TOT DPTH: 15FT.	DPTH TO ∇ 10.0 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: N/A		SITE: #1

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0				SAND-fine to silty, tan, w/ some shell fragments		SM		
5		2/2	0	Same as above			4.5,4.5	
10		2/2	0	SAND-fine to silty, gray, saturated			8.8,8.5	
15				Boring terminated @ 15'				

TITLE: fayport Naval Station, Mayport, Fl.		LOG of WELL: MPT1-P3	BORING NO. MPT1-P3
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/92	COMPLTD: 1/18/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 10-15'	PROTECTION LEVEL: D
TOC ELEV.: 11.04 FT.	MONITOR INST.: FID	TOT DPTH: 15FT.	DPTH TO ∇ 7.00 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: N/A		SITE: #1

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
					SAND-very fine to medlum, tan, w/ some shell fragments		SP		
5			2/2	0	Same as above, dry			10,10,7,8	
			1.7/2	0	SAND-very fine to silty, tan, saturated		SM	8,8,7,8	
10									
15					Boring terminated @ 15'				
20									
25									
30									

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-1	BORING NO. MPT-2-1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 5097
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/22/87	COMPLTD: 9/22/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 3-10'	PROTECTION LEVEL: 0
TOC ELEV.: 8.43 FT.	MONITOR INST.: Hnu	TOT DPTH: 10.0 FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: R. M. Nugent	WELL DEVELOPMENT DATE: 9/22/87		SITE: #2

DEPTH FT	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/B-IN	WELL DATA
5	SS1	1.5/2'	83.1	Sand-fine to medium sand, dark brown, dry Sand-fine, tan, dry, trade shell	[Dotted pattern]	SP	13,14,16,26	[Well data diagram]
	SS2	1.8/2'	35.7	Sand-fine, tan, dry			7,13,13,14	
	SS3	0.7/2'	10.4	Sand-fine, tan, moist, few shell fragments, bottom saturated			18,12,5,4	
	SS4	2.0/2'	0	Sand-fine to medium, gray, few shell fragments, saturated			11,10,1,2	
10								
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-2	BORING NO. MPT-2-2
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 5097	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/22/87	COMPLTD: 9/22/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 3-10'	PROTECTION LEVEL: D
TOC ELEV.: 7.58 FT.	MONITOR INST.: Hnu	TOT DPTH: 10.0FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: R. M. Nugent	WELL DEVELOPMENT DATE: 9/22/87		SITE: #2.

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0	SS1	1.8/2'	0	Sand - Top (0.2') fine, dark brown, dry / Middle (0.7') fine, tan, moist / Bottom clayey, dark brown to black, moist, trade shell, stiff	SP	SP	4,13,14,14	
1.8	SS2	1.5/2'	0	Sand - Top (0.5') as above / Middle (0.5') fine to medium, gray moist / Bottom as above, saturated	SP	SP	13,17,29,30	
3.3	SS3	1.9/2'	0	Sand - fine to medium, dry, silt, few shell fragments with a clay lens (0.5')	SP	SP	11,8,2,1	
5.2	SS4	0.5/2'	0	Clay - dry, olive	CL	CL	5	

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-3	BORING NO. MPT-2-3
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 5087	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/11/87	COMPLTD: 9/14/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 5-15'	PROTECTION LEVEL: 0
TOC ELEV.: 17.34 FT.	MONITOR INST.: Hnu	TOT DPTH: 15.0 FT.	DPTH TO ∇ 7.00 FT.
LOGGED BY: R. M. Nugent	WELL DEVELOPMENT DATE: 9/11/87		SITE: #2.

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
	SS1	1.4/2'	0	Sand-Top (0.4') / fine to medium, top soil, dark brown, dry, trace shell, Bottom / fine, brown, few shell fragments decreasing with depth		SP	8,15,8,9	
	SS2	1.7/2'	34.4	Sand-fine, tan, dry, increasing moisture with depth			24,35,30,13	
	SS3	1.5/2'	8.7	Sand-fine to medium, gray, moist, few shell fragments, trace coarse sand concretions			23,38,28,35	
5	SS4	1.4/2'	0				7,9,8,9	
10	SS5	2.0/2'	17	Sand-fine, gray, saturated, few shell fragments, trace gravel size sand concretions			5,14,28,55	
				Clay-		CL		
15	SS6	2.0/2'	7	Sand-fine, grey, saturated, few shell fragments		SP	7,50	
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-4	BORING NO. MPT-2-4
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/11/87	COMPLTD: 9/11/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 3-13'	PROTECTION LEVEL: 0
TOC ELEV.: 8.28 FT.	MONITOR INST.: Hnu	TOT DPTH: 15.0FT.	DPTH TO ∇ 5.10 FT.
LOGGED BY: M. C. Dibilin	WELL DEVELOPMENT DATE: 9/11/87		SITE: #2.

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
	SS1	15/2'		Sand-fine to medium with top soil, vegetation, gravel, small shell fragments with a layer (0.5') of clayey sand, orange, moist at 1' depth		SP	4,12,17,20	
						SC		
						SP		
5	YES SS2	13/2'		Sand-fine, light grey, small shell fragments, saturated			8,11,5,10	
10	SS3	2.0/2'		Clay-uniform, olive, decomposed organics		CL	4,5,9,10	
15	SS4	1.5/2'		Clay-same as above		SP	3,8,11,18	
				Sand- top (0.4') very fine, greenish grey, bottom interbedded with sand and clay		SC		

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-5	BORING NO. MPT-2-5
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/23/87	COMPLTD: 9/23/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 3-10'	PROTECTION LEVEL: 0
TOC ELEV.: 9.81 FT.	MONITOR INST.: Hnu	TOT DPTH: 10.0 FT.	DPTH TO ∇ 3.0 FT.
LOGGED BY: M. C. Doblin	WELL DEVELOPMENT DATE: 9/23/87		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0-1.6/2'	SS1	1.6/2'		Sand-top (0.5') fine to medium sand, top soil, dark brown, dry/ bottom (1.1') light to dark grey, trace coarse sand and shell fragments, dry to moist		SP	17,23,30,S	
1.6/2'-3.2/2'	SS2	1.4/2'	38.2	Sand-fine to coarse, light grey, few shell fragments, saturated			1,7,10,8	
3.2/2'-10.0/1'	SS3	0.7/1'		Clay-dark, olive, saturated		CL SP	11,13	

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-6	BORING NO. MPT-2-6
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 5097-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/22/87	COMPLTD: 9/22/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 3-10'	PROTECTION LEVEL: 0
TOC ELEV.: 8.428 FT.	MONITOR INST.: Hnu	TOT DPTH: 10.0 FT.	DPTH TO ∇ 4.0 FT.
LOGGED BY: R. M. Nugent	WELL DEVELOPMENT DATE: 9/22/87		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5	SS1	1.8/2'	0	Sand-top (0.4') fine, top soil, dark brown, dry/ middle (0.4') fine to medium, light tan, dry, few shell fragments/ bottom same as above, trace gravel, moist with a clay layer (0.4') interbedded with some sand, some shell		SP	14,31,35,41	
	SS2	1.5/2'	0			CL	19,27,28,28	
	SS3	1.5/2'	0	Sand-fine to medium, gray, saturated, few shell fragments		SP	2.5,7,12	
	SS4	1.8/2'	0	Clay-dark olive, organic		CL	4,5,5,10	

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT-2-7S	BORING NO. MPT-2-7S
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 5097-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 7/15/87	COMPLTD: 7/22/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 3.5-10.5'	PROTECTION LEVEL: 0
TOC ELEV.: 10.58 FT.	MONITOR INST.: Hnu	TOT DPTH: 12.0 FT.	DPTH TO ∇ 4.75 FT.
LOGGED BY: M. C. Dible	WELL DEVELOPMENT DATE: 9/23/87	SITE: #2	

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
	SS1		2.8	Clay-dark brown, stiff, some vegetation on the top soil		CL	8,20,38,27	
YES	SS2		5.2	Sand-fine to medium, few shells, dry		SP	13,13,9,11	
	SS3		8.2	Sand-same as above, tan, dry to moist				
5							11,27,3,1	
	SS4		4.80	Sand-fine to medium, light grey, few shell fragments, saturated		CL	5,2,2,5	
10				Clay-dark olive, shelly, moist				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-7D	BORING NO. MPT-2-7D
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 5097-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/23/87	COMPLTD: 9/23/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 15-25'	PROTECTION LEVEL: D
TOC ELEV.: 10.08 FT.	MONITOR INST.: Hnu	TOT DPTH: 25.0FT.	DPTH TO ∇ 7.0 FT.
LOGGED BY: M. C. Diblen	WELL DEVELOPMENT DATE: 9/23/87		SITE: #2

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0				Top soil (0.2') clayey with vegetation		SP		
0.2-0.4				Clayey sand-middle (0.2-0.4') dark brown, stiff, shell fragments and sand, dry		CL SP		
				Sand-fine to medium, light tan with few shell fragments, dry				
				Sand-same as above				
5				Sand-same as above, dry to moist with a layer (0.3') clay interstitial with sand, few gravel/pebble concretions		SC SP		
10	SS1	1.4/2'	0	Sand-fine to coarse, grey, some shell fragments, saturated			20,31,19,16	
10.3	SS2	0.9/2'	0.3	Clayey Sand-dark brown, saturated, trace shell fragments		CL	3,4,12,17	
				Clay-dark olive, saturated		SC		
15	SS3	12'	0	Sand-fine to medium, brown, saturated, few shell fragments, bottom grey to green, no shells		SP	-	
25	SS4		25				20,21,21,18	
25	SS5	2.0/2'	0	Clay-grey to green, plastic, sticky		CL	-	
				Sandy Clay-grey to green, grading back to clay				

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT-2-8	BORING NO. MPT-2-8
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 5097-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 8/23/87	COMPLTD: 8/23/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 3-10"	PROTECTION LEVEL: D
TOC ELEV.: 10.5 FT.	MONITOR INST.: Hnu	TOT DPTH: 10.0 FT.	DPTH TO ∇: 3.0 FT.
LOGGED BY: M. C. Dible	WELL DEVELOPMENT DATE: 8/23/87		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5	SS1	12/2'	8.8	Sand-top (0.4')/ top soil, fine, brown, dry, middle (0.4-1')/ fine to medium, tan, bottom/ black, similar to burnn asphalt, dry	[Dotted pattern]	SP	13,12,11,14	[Well data diagram]
	SS2	0.2/2'		No sample in spoon-Augured mat black gravel with fine to coarse sand			18,17,19,25	
5	SS3	0.8/2'	8.0	Sand-fine to coarse, dark grey, few shells, trac clay, saturated bottom/ as above, light gray, few shell fragments, saturated	[Dotted pattern]	SP	13,19,17,21	[Well data diagram]
	SS4	2/2'	0	Clay-dark olive clay, saturated			CL	
10					[Horizontal lines pattern]	CL		
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-9S	BORING NO. MPT-2-9S
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/22/87	COMPLTD: 9/22/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 15-25'	PROTECTION LEVEL: 0
TOC ELEV.: 10.53 FT.	MONITOR INST.: Hnu	TOT DPTH: 10.0FT.	DPTH TO ∇ 3.0 FT.
LOGGED BY: R. M. Neugent	WELL DEVELOPMENT DATE: 9/22/87		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0				Sand-fine to medium, dark to light brown, dry, few shell fragments	[Stippled pattern]	SP		[Well data column]
10				Clay-dark olive, saturated	[Horizontal lines pattern]	CL		[Well data column]
15				Sand-fine, light brown, saturated, bottom gray with few shell fragments	[Stippled pattern]	SP		[Well data column]
20								[Well data column]
25								[Well data column]
30								[Well data column]

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-9D	BORING NO. MPT-2-9D
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/22/87	COMPLTD: 9/22/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 15-25'	PROTECTION LEVEL: 0
TOC ELEV.: 10.58 FT.	MONITOR INST.: Hnu	TOT DPTH: 25.0 FT.	DPTH TO \bar{u} 7.0 FT.
LOGGED BY: M. C. Dibilin	WELL DEVELOPMENT DATE: 9/23/87		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
	YES	SSI	3.5 Sand-fine to medium, dark brown, dry	[Dotted pattern]	SP	8,9,27,30	[Well data column]
		1.8/2'	Sand-fine to medium, light brown, dry, few shell fragments				
			1.85/2'				
5		SS2	78.3 Sand-as above	[Dotted pattern]	SP	19,28,30,21	[Well data column]
		1.8/2'	Sand-fine, gray, moist, trace shell fragments, bottom saturated				
		2.0/2'					
		SS3	2.3 Clay-dark olive, saturated	[Horizontal lines]	CL	2,2,3,4	
		SS4	13.0			6,8,37,22	
		SS5	6.7 Sand-fine, light brown, saturated, bottom gray with few shell fragments	[Dotted pattern]	SP	?	
		SS6	1.3/2'				
15		SS6	0.8 Sand-as above			9,15,31,?	
			1.9/2'				
		SS7	11.2 Sand-as above			?	
			1.3/2'				
25		SS8	14.5 Sand-fine, gray, saturated, some shell fragments in the bottom			?	
			-				
30							

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT-2-10	BORING NO. MPT-2-10
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 5 97-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/10/87	COMPLTD: 9/10/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 5-10'	PROTECTION LEVEL: D
TOC ELEV.: 10.3 FT.	MONITOR INST.: Hnu	TOT DPTH: 15.0FT.	DPTH TO ∇ 5.8 FT.
LOGGED BY: M. C. Dibli	WELL DEVELOPMENT DATE: 9/17/87		SITE: #2

DEPTH F.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
7.1	SS1	15/2'		Sand-fine to medium, light gray, shell fragments, well sorted with a top sandy clay layer, slightly moist		SP	40,34,40,34	
15.3	SS2			Sand-fine to medium, shells and fragments, very moist			9,21,18,13	
5.1	SS3			Silty Clay-dark olive to black, decomposed organic matter, very moist		OL	5,4,4,7	
5.3	SS4			Sand-fine, light tan, organic matter, saturated		SP	8,9,11,17	

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-MW-11S	BORING NO. MPT2-MW-11S
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/21/92	COMPLTD: 1/21/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 2-12"	PROTECTION LEVEL: 0
TOC ELEV.: 5.73 FT.	MONITOR INST: PORTA-FID	TOT DPTH: 12FT.	DPTH TO ∇ 2.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 1/28/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0	MPT-2-11-1.5-1	<input checked="" type="checkbox"/>	N/A	0	SAND-very fine to fine, grey Note: Resampled on 1/24/92 utilizing a stainless steel hand auger		SP	3,4,3,4	
5			1.7/2	0	CLAY-dark brown, highly organic		OH	1,2,1,-	
12					Boring terminated @ 12'				

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-MW-12S	BORING NO. MPT2-MW-12S
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/24/82	COMPLTD: 1/24/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 2-12'	PROTECTION LEVEL: 0
TOC ELEV.: 5.51 FT.	MONITOR INST.: FID	TOT DPTH: 12FT.	DPTH TO ∇ 3.00 FT.
LOGGED BY: Larry Smith	WELL DEVELOPMENT DATE: 1/28/82		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0	MPT-2-12-2.5-1	<input checked="" type="checkbox"/>			SAND-fine, tan Note: Sample obtained with stainless steel hand auger		SP		
5					SAND-fine, dk. brown, high clay content w/ organics		SC		
10					CLAY-dk. brown, highly organic		OL		
12	Boring terminated @ 12'								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-MW-12D	BORING NO. MPT2-MW-12D
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/27/92	COMPLTD: 1/27/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 14-24'	PROTECTION LEVEL: D
TOC ELEV.: 5.42 FT.	MONITOR INST.: FID	TOT DPTH: 24.5FT.	DPTH TO ∇ 5.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 1/28/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND-fine, tan		SP		
5					SAND-fine, dk. brown, high clay content w/ organics		SC		
10					CLAY-dark brown, highly organic		OL		
15			1.8/2	5.5	SAND-very fine to silty, dark grey, saturated		SM	1,1,2,8	
20			0.5/2	1.2	GRAVEL SIZE SHELL FRAGMENTS		GP	8,5,8,8	
25			2/2	2.4	SAND-very fine to silty, grey, w/ abundance of shell fragments		SP	4,5,8,8	
25					Boring terminated @ 25'				

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-2-15SR	BORING NO. MPT-2-15SR
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 5087-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/14/87	COMPLTD: 9/14/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 5-15'	PROTECTION LEVEL: 0
TOC ELEV.: 8.85 FT.	MONITOR INST.: Hnu	TOT DPTH: 15.0FT.	DPTH TO ∇ 4.0 FT.
LOGGED BY: M. C. Divilin	WELL DEVELOPMENT DATE: 9/14/87		SITE: #2

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
	SS1	1.1/2'	2.7	Clayey Sand-with vegetation		SP	11,17,20,28	
	YES SS2	1.85/2'	0	Sand- top (0.4-0.8')/ fine, uniform, tan, shell fragments, middle (0.8-0.7')/ dark brown clay with some sand bottom/ fine to medium, mottled greyish brown, poorly sorted			9,10,18,20	
5				Sand- top (0.4')/ fine to medium, light gray to tan, dry middle (0.4-1.0)/ medium to coarse, dark to light gray bottom (1.0-1.85)/ light grey to tan, with a layer of plastic clay interbedded with sand, Fe Oxide bands				
		2.0/2'						
10	SS3		4.1	Sandy clay-fine to medium, dark brown, dry Clay-light gray, moist, bottom/ dark green to olive with organic material, plastic, moist		SC CL	1,2,2,2	
15	SS5	2.0/2'	4.3	Clay-green/brown to olive, organic matter, moist Clayey Sand-very fine, light grey, moist		SP	4,9,20,13	
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT-2-15DR	BORING NO. MPT-2-15DR
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 5097-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/23/87	COMPLTD: 9/23/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 15-25'	PROTECTION LEVEL: 0
TOC ELEV.: 8.88 FT.	MONITOR INST.: Hnu	TOT DPTH: 25.0FT.	DPTH TO ∇ 7.4 FT.
LOGGED BY: M. C. Dible	WELL DEVELOPMENT DATE: 9/23/87		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0-10				Clay-dark olive, saturated, some organic matter Sand - top (0.4-0.8') fine, uniform, tan, shell fragments, middle (0.8-0.7') dark brown clay with some sand bottom/ fine to medium, mottled grayish brown, poorly sorted		SP		
5				Sand - top (0.4') fine to medium, light gray to tan, dry middle (0.4-1.0) medium to coarse, dark to light gray bottom (1.0-1.85) light gray to tan, with a layer of plastic clay interbedded with sand, Fe Oxide bands				
10	SS1	2.0/2'	0	Sandy clay- fine to medium, dark brown, dry		SC	1,1,3,3	
12	SS2	2.0/2'	0	Clay- light gray, moist, bottom/ dark green to olive with organic material, plastic, moist		CL	10,3,7,4	
14				Clayey Sand-dark grey Clayey Sand-with vegetation		SC		
15	SS3	0.8/2'	8.8	Sand- top (0.4-0.8')/ fine, uniform, tan, shell fragments, middle (0.8-0.7')/ dark brown clay with some sand bottom/ fine to medium, mottled greyish brown, poorly sorted		SP	8,8,13,15	
17				Sand- top (0.4')/ fine to medium, light gray to tan, dry middle (0.4-1.0)/ medium to coarse, dark to light gray bottom (1.0-1.85)/ light grey to tan, with a layer of plastic clay interbedded with sand, Fe Oxide bands				
20				Sandy clay-fine to medium, dark brown, dry				
22				Clay-light gray, moist, bottom/ dark green to olive with organic material, plastic, moist				
24				Clay-green/brown to olive, organic matter, moist				
25	SS4	2.0/2'	2.8	Clayey Sand-very fine, light grey, moist			8,8,8,4	
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-MW-16S	BORING NO. MPT2-MW-16S
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/21/92	COMPLTD: 1/21/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 2-12'	PROTECTION LEVEL: 0
TOC ELEV.: 5.51 FT.	MONITOR INST.: PID	TOT DPTH: 12FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 1/22/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0	MPT-2-16-2-1	0/2		Sandy brown fill w/ shell fragments No sample recovered Note: Resampled 1/24/92 utilizing stainless steel hand auger		SP	22,14,14,12	
0		2/2	1.0	SAND-fine, grey, saturated CLAY-dark brown, highly organic		PT	8,4,3,4	
12				Boring terminated @ 12'				

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-MW-1800	BORING NO. MPT2-MW-1800
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/17/92	COMPLTD: 1/20/92
METHOD: Mud Rotary	CASE SIZE: 4"	SCREEN INT.: 90-100'	PROTECTION LEVEL: D
TOC ELEV.: 6.88 FT.	MONITOR INST.: FID	TOT DPTH: 100FT.	DPTH TO ∇ 3.5 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: 2/14/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5		1/2	0	SAND-fine, brown, w/ shell fragments		SP	3,5,14,10	
10		1.7/2	1.0	CLAY-silty, dk. brown, some organics, soft		OL	N/A	
15		0.7/2	0	SAND-fine to medium, dk. brown, saturated		SP	1,1,3,4	
20		1.8/2	0.3	SAND-very fine to fine, gray, w/ shell fragments		SP	1,1,4,3	
25		N/A	0.7	SAND-very fine to silty, gray, trace shell fragments		SM	1,2,2,3	
30		1.8/2	N/A	SAND-clayey, fine to medium, olive green, w/ shell fragments		SC	2,4,5,4	

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-MW-1800	BORING NO. MPT2-MW-1800
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/17/92	COMPLTD: 1/20/92
METHOD: Mud Rotary	CASE SIZE: 4"	SCREEN INT.: 90-100'	PROTECTION LEVEL: D
TOC ELEV.: 6.89 FT.	MONITOR INST.: FID	TOT DPTH: 100FT.	DPTH TO ∇ 3.5 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: 2/14/92	SITE: #2	

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
				Continued from PAGE 1				
		1.8/2				SC		
35		1/2	N/A			GC	3,3,4,4	
10		1.8/2	N/A	CLAY-olive green, stiff, good plasticity (2") over SAND-fine to medium, silty, gray (3")		CH SM	5,4,11,22	
45		1/2	N/A				15,18,27,33	
50		1.2/2	N/A	SAND-silty, gray, w/ small clay lenses 1" thick every 4"		SC	15,21,34,50	
		1.2/2	N/A	SAND-very fine to fine, w/ some silt, tan, tight, wet		SM	15,28,21,37	
55								
80		1.2/2	N/A				15,10,20,22	

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-MW-1600	BORING NO. MPT2-MW-1600
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/17/92	COMPLTD: 1/20/92
METHOD: Mud Rotary	CASE SIZE: 4"	SCREEN INT.: 90-100'	PROTECTION LEVEL: D
TOC ELEV.: 8.89 FT.	MONITOR INST.: FID	TOT DPTH: 100FT.	DPTH TO ∇ 3.5 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: 2/14/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 2								
65		2/2	0	SAND-as above (3") over Gravel size shell fragments and quartz, loose (1") over SAND-as above (3")		SM	15,29,41,32	
70		1/2	1.0	CLAY-silty, olive green, some interbedded limestone fragments		CL	8,8,22,25	
75		1.2/2	1.2	CLAY-as above			24,8,8,8	
80		1.8/2	0	CLAY-as above			19,29,50,-	
85		1.8/2	0	CLAY-as above			15,25,29,33	
90		1.8/2	0	CLAY-as above			12,16,17,18	

TITLE: Mayport Naval Station, Mayport, FL.		LOG of WELL: MPT2-MW-1800	BORING NO. MPT2-MW-1800
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/17/92	COMPL TO: 1/20/92
METHOD: Mud Rotary	CASE SIZE: 4"	SCREEN INT.: 90-100'	PROTECTION LEVEL: D
TOC ELEV.: 8.89 FT.	MONITOR INST.: FID	TOT DPTH: 100FT.	DPTH TO ∇ 3.5 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: 2/14/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
			1.8/2				CL		
95			1.5/2	1.8	CLAY-as above (8") over SAND-fine, gray, wet			27,33,50,-	
			1.2/2	3.7	SAND-as above (1') over CLAY-as above (3")		SM		
20							CL	18,22,22,35	
					Boring terminated @ 100'				
105									
110									
115									
120									

Continued from PAGE 3

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-MW-17S	BORING NO. MPT2-MW-17S
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/21/92	COMPLTD: 1/21/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 3-13'	PROTECTION LEVEL: 0
TOC ELEV.: 7.73 FT.	MONITOR INST.: PID	TOT DPTH: 13FT.	DPTH TO ∇ 5.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 2/12/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/B-IN	WELL DATA
0		N/A	0	SAND-fine, tan, shell fragments	[Dotted Pattern]	SP	4,2,1,1	[Well Diagram]
0				No sampled recovered				
5		1.5/2	0	SAND-fine, gray, shell fragments, saturated			1,1,1,-	
15				Boring terminated @ 13'				

TITLE: Mayport Naval Station, Mayport, Fl.

LOG of WELL: MPT2-MW-1700

BORING NO. MPT2-MW-1700

CLIENT: SOUTHERN DIVISION, NAVFACENGCOM

PROJECT NO: 7533-81

CONTRACTOR: GROUNDWATER PROTECTION, INC.

DATE STARTED: 1/21/82

COMPLTD: 1/28/82

METHOD: Mud Rotary

CASE SIZE: 4"

SCREEN INT.: 115-125"

PROTECTION LEVEL: 0

TOC ELEV.: 7.79 FT.

MONITOR INST.: PID

TOT DPTH: 125FT.

DPTH TO ∇ 4.00 FT.

LOGGED BY: Randy Holloway

WELL DEVELOPMENT DATE: 2/12/82

SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0 - 15				SAND-fine, tan, shell fragments	[Dotted pattern]	SP		
15 - 20				SAND-fine, fine, gray, shell fragments, saturated				
15 - 20		1.8/2	0	SAND-as above			4,3,2,2	
20 - 25		1.8/2	0.2	SAND-as above, w/ abundance of shell fragments			5,5,7,8	
25 - 30		2/2	0	CLAY-very silty, olive green	[Horizontal lines]	CL	2,2,3,4	
30 - 31		1/2	0.3		[Diagonal lines]	SM	7,8,18,25	

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-MW-1700	BORING NO. MPT2-MW-1700
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/21/82	COMPLTD: 1/28/82
METHOD: Mud Rotary	CASE SIZE: 4"	SCREEN INT: 115-125'	PROTECTION LEVEL: D
TOC ELEV.: 7.78 FT.	MONITOR INST: PID	TOT DPTH: 125FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 2/12/82		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
				Continued from PAGE 1				
		1/2		SAND-very fine to silty, saturated		SM		
35		1.5/2	0.2	SAND-fine to medium, tan, w/ some shell fragments (1") over SAND-very fine to silty, w/ abundance of shell fragments (8")			39,31,30,32	
40		0.8/2	0.2	SAND-very fine to fine, gray, w/ some shell fragments, wet		SP	39,50,-,-	
45		0.8/2	1.3	SAND-as above			14,18,24,21	
50		0.5/2	0	SAND-as above			10,18,25,22	
55		0.5/2	0	CLAY-silty, gray		CL	8,10,10,14	
60						SM		

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-MW-1700	BORING NO. MPT2-MW-1700
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/21/82	COMPLTD: 1/28/82
METHOD: Mud Rotary	CASE SIZE: 4"	SCREEN INT: 115-125'	PROTECTION LEVEL: 0
TOC ELEV.: 7.79 FT.	MONITOR INST.: PID	TOT DPTH: 125FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 2/12/82		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
Continued from PAGE 2								
85		2/2	0.4	SAND-very fine to silty, tan, w/ a few shell fragments + 1" bands of clay every 4"		SM	24,18,14,27	
70		15/2	0.3	SAND-very fine, gray, hard, w/ some shell fragments		SP	24,42,50,-	
75		2/2	0.2	SAND-as above, w/ phosphate nodules			4,18,28,28	
80		2/2	0.2	SAND-fine to medium, olive green, wet (9") over CLAY-sandy, olive green, hard (15")		CL	10,11,8,22	
85		2/2	0.3	SAND-very fine to silty, olive green, moist, w/ black phosphate nodules		SM	5,5,8,11	
90								

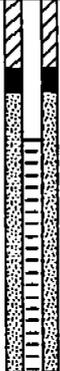
TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-MW-170D	BORING NO. MPT2-MW-170D
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/21/92	COMPLTD: 1/29/92
METHOD: Mud Rotary	CASE SIZE: 4"	SCREEN INT.: 115-125'	PROTECTION LEVEL: D
TOC ELEV.: 7.79 FT.	MONITOR INST.: PID	TOT DPTH: 125FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 2/12/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
Continued from PAGE 3								
95		2/2	0.2	SAND-as above	SM		4,8,8,8	
		2/2	0.2	SAND-as above			5,8,14,18	
100		2/2	0.3	SAND-as above			9,11,17,17	
105		2/2	0.8	SAND-as above		SC	14,21,20,30	
110		2/2	0.2	SAND-as above, w/ higher clay content			12,10,18,20	
115		2/2	0.2	CLAYEY SAND- as above			14,12,18,21	
120		1/2	0.2				12,18,17,21	

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-MW-17DD	BORING NO. MPT2-MW-17DD
CLIENT: SOUTHERN DIVISION, NAVFACENGC0M		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/21/92	COMPLTD: 1/29/92
METHOD: Mud Rotary	CASE SIZE: 4"	SCREEN INT: 115-125'	PROTECTION LEVEL: D
TOC ELEV.: 7.79 FT.	MONITOR INST.: PID	TOT DPTH: 125FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 2/12/92		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				Continued from PAGE 4				
		1/2		CLAYEY SAND- as above		SC		
125		15/2	0.2	CLAYEY SAND- as above			3,4,7,10	
130				Boring terminated @ 125'				
135								
140								
145								
150								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-P1	BORING NO. MPT2-P1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/14/82	COMPLTD: 1/14/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 3-8'	PROTECTION LEVEL: D
TOC ELEV.: 7.75 FT.	MONITOR INST.: PID	TOT DPTH: 8 FT.	DPTH TO ∇: 3.00 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5		1.8/2	100	SAND—fine to medium, silty, olive green, w/ shell fragments		SP	3,3,3,3	
10				Boring terminated @ 8'				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-P2	BORING NO. MPT2-P2
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/14/92	COMPLTD: 1/14/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 4-8'	PROTECTION LEVEL: 0
TOC ELEV.: 7.97 FT.	MONITOR INST.: FID	TOT DPTH: 8FT.	DPTH TO ∇ N/A FT.
LOGGED BY: PAT CRAINE	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5			1.8/2	0.2	SAND-fine to medium, olive green to gray, w/ shell fragments	[stippled pattern]	SP	8,8,4,5	[diagonal lines]
0					Boring terminated @ 8'				[diagonal lines]
15									
20									
25									
30									

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-P3	BORING NO. MPT2-P3
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/14/82	COMPLTD: 1/14/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 27-32'	PROTECTION LEVEL: 0
TOC ELEV.: 31.93 FT.	MONITOR INST.: FID	TOT DPTH: 32FT.	DPTH TO ∇ 28 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
				SAND-very fine to fine, tan, w/ shell fragments	[Lithologic Symbol: Dotted Pattern]	SP		[Well Data: Hatched Pattern]
5			4 SAND-very fine to fine, olive green, w/ shell fragments, moist					
10			12 SAND-fine, tan, moist					
15			7 SAND-as above					
20			7 SAND-as above					
25			9.8 SAND-very fine to fine, olive green, moist					
30		1.8/2	30 SAND-very fine, olive green, w/ shell fragments, saturated			4,7,7,7		
35			Boring terminated @ 32'					
40								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-P4	BORING NO. MPT2-P4
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/14/82	COMPLTD: 1/15/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 30-35'	PROTECTION LEVEL: 0
TOC ELEV.: 32.74 FT.	MONITOR INST: PID	TOT DPTH: 35FT.	DPTH TO ∇ 28 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A	SITE: #2	

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
2.0				SAND-very fine to fine, tan, loose		SP		
10				SAND-very fine to fine, lt. brown, loose				
9.0				SAND-as above				
20		1.8/2		CLAY-silty, black, organic, moist		OL	8.7,4,4	
				Boring terminated @ 35'				

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-P5	BORING NO. MPT2-P5
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/15/92	COMPLTD: 1/15/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 8-11"	PROTECTION LEVEL: 0
TOC ELEV.: 7.15 FT.	MONITOR INST: PID	TOT DPTH: 11 FT.	DPTH TO ∇ 5.50 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5		1.7/2	7.8	SAND-very fine to fine, tan, w/ abundance of shell fragments	[Dotted pattern]	SP	4.5,7.8	[Well data diagram]
				SAND-very fine to fine, gray, w/ shell fragments, saturated				
10				Boring terminated @ 11'				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-P8	BORING NO. MPT2-P8
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/15/92	COMPLTD: 1/15/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: D
TOC ELEV.: 5.08 FT.	MONITOR INST.: PID	TOT DPTH: 10FT.	DPTH TO ∇ 3.5 FT.
LOGGED BY: R.W. HOLLOWAY	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
				Black sandy top soil		SP		
5		1.8/2	58.8	SAND-fine to very fine, grey, saturated, trace organics			1,2,1,-	
				SAND-silty, gray, saturated		SM		
				Boring terminated @ 10'				

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-P7	BORING NO. MPT2-P7
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: D
TOC ELEV.: 7.95 FT.	MONITOR INST.: PID	TOT DPTH: 10FT.	DPTH TO ∇ 5.00 FT.
LOGGED BY: R.W. HOLLOWAY	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0				Black sandy top soil		SP		
0				SAND-very fine to fine, tan, loose				
5		12/2	22	SAND-fine to very fine, grey, abundance of shell fragments			8,4,5,4	
10				Boring terminated @ 10'				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-P8	BORING NO. MPT2-P8
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: 0
TOC ELEV.: 8.35 FT.	MONITOR INST.: PID	TOT DPTH: 10FT.	DPTH TO § 4 FT.
LOGGED BY: R.W. HOLLOWAY	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
18.8				CLAY-silty, organic, dk. brown, w/ some shell fragments		CL		
50.2	2/2			SAND-fine to very fine, grey, abundance of shell fragments		SP	1-	
				CLAY-organic, dk. brown, moist		OL		
				Boring terminated @ 10'				

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-P8	BORING NO. MPT2-P8
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 30-35'	PROTECTION LEVEL: D
TOC ELEV.: 32.18 FT.	MONITOR INST.: PID	TOT DPTH: 35FT.	DPTH TO ∇ 28.5 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
				SAND-very fine to fine, tan, loose, few shell fragments		SP		
5			2.3	SAND-as above				
10			11.8	SAND-as above				
15			2.3	SAND-as above				
20			3.1	SAND-as above				
30		0.5/2	4.0	SAND-very fine to fine, gray, saturated			7,8,8,8	
35				Boring terminated @ 35'				
40								

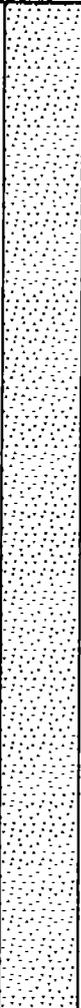
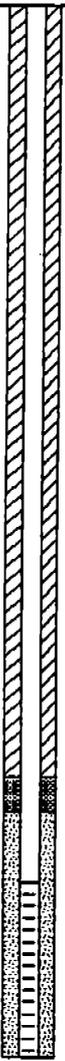
TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-P10	BORING NO. MPT2-P10
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 30-35'	PROTECTION LEVEL: D
TOC ELEV.: 32.02 FT.	MONITOR INST.: PID	TOT DPTH: 35FT.	DPTH TO ∇ 27 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5				SAND-very fine to fine, tan, loose, few shell fragments	[Dotted pattern]	SP		[Hatched pattern]
10				NOTE: Split-spoon sampling was not performed while penetrating material used to construct berm.				
15								
20								
25								
30		12/2	4.0	SAND-very fine to fine, grey, saturated, over 8" of clay, silty dark grey, low plasticity	[Horizontal lines]	CL	6.5,8.8	
35				Boring terminated at 35'				
40								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT2-P11	BORING NO. MPT2-P11
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 30-35'	PROTECTION LEVEL: 0
TOC ELEV.: 31.85 FT.	MONITOR INST.: N/A	TOT DPTH: 35FT.	DPTH TO ∇ 28 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0-15				SAND-very fine to fine, tan, w/ some shell fragments		SP		
15-30				SAND-very fine to silty, gray, w/ shell fragments		SM		
30-35		0.9/2	5.2	SAND-as above, saturated			15,14,18,18	
35-40				Boring terminated @ 35'				

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-P12	BORING NO. MPT2-P12
CLIENT: SOUTHERN DIVISION, NAVFACENGC0M		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/92	COMPLTD: 1/18/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 25-30'	PROTECTION LEVEL: D
TOC ELEV.: 32.75 FT.	MONITOR INST.: N/A	TOT DPTH: 30FT.	DPTH TO ∇ 25 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5					SAND-fine, tan, w/ some shell fragments		SP		
10									
15									
20									
25									
30			1.5/2	0.5	SAND-fine, gray, saturated, over 1' CLAY-black, highly organic		OH	1,2,4,8	
35					Boring terminated @ 31'				
40									

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT2-P13	BORING NO. MPT2-P13
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/23/82	COMPLTD: 1/23/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: 0
TOC ELEV.: 11.87 FT.	MONITOR INST.: FID	TOT DPTH: 10FT.	DPTH TO ∇ 2.0 FT.
LOGGED BY: Larry Smith	WELL DEVELOPMENT DATE: N/A		SITE: #2

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
				SAND-clayey, lt. gray, organic, w/ shell fragments		SC		
		15/2	0.2	CLAY-dark gray, plastic, minor silt & sand		CL	4,3,2,3	
5				CLAY-same as above, grading to higher sand content				
10				Boring terminated @ 10'				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT-8-1	BORING NO. MPT-8-1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 5097-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/17/87	COMPLTD: 9/17/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 5-18.5'	PROTECTION LEVEL: D
TOC ELEV.: 15.74 FT.	MONITOR INST: Hnu	TOT DPTH: 17.0 FT.	DPTH TO ∇ 8.0 FT.
LOGGED BY: M. C. Dibleh	WELL DEVELOPMENT DATE: 9/17/87		SITE: #8

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0.8	SS1	1.8/2'		Sand-uniform, light tan, dry with dark brown to black top soil		SP	5,5,24,38	
1.8	SS2	1.8/2'	188	Sand-top/ fine, dark brown, organic sandy soil, middle/ light brown bottom/ fine to medium, light grey			18,17,33,41	
2.6	SS3	1.1/2'		Sand-fine to medium, few shell fragments			8,8,8,2	
4.0	SS4	2.0/2'	140	Sand-top/ fine to medium, dark grey with black silty sand layers bottom/ light grey, with clay lens			1,3,1,2	
15.7	SS5	1.7/2'	52.3	Sand-fine, uniform, with small clay, a clay, a layer (0.15') uniform, plastic, grey, some shell fragments at the bottom			7,18,17,8	

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT-8-2	BORING NO. MPT-8-2
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 8/17/87	COMPLTD: 8/17/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-17'	PROTECTION LEVEL: 0
TOC ELEV.: 14.00 FT.	MONITOR INST.: Hnu	TOT DPTH: 15.0 FT.	DPTH TO ∇ 9.50 FT.
LOGGED BY: M. C. Dillin	WELL DEVELOPMENT DATE: 8/17/87		SITE: #8

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
	SS1	2.0/2'		Sand-fine to medium, tan, few shell fragments, dry, bottom/ tan to grey, many shells		SP	13,20,22,38	
5	SS2	1.7/2'		Sand-same as above, dark brown on the top, light grey at the bottom		17,21,30,58		
	SS3	1.1/2'	YES	Sand-same as above		12,13,20,22		
10	SS4	1.1/2'		Sand-fine to medium, grey, shells and fragments, grading to fine sand		8,9,13,18		
15	SS5	2.0/2'		Sand-same as above, light grey, with many shells		4,7,9,13		

TITLE: Mayport Naval Station, Mayport, Fl.

LOG of WELL: MPT-8-3

BORING NO. MPT-8-3

CLIENT: SOUTHERN DIVISION, NAVFACENGCOM

PROJECT NO: 5097F04

CONTRACTOR: MONITOR TESTING

DATE STARTED: 9/18/87

COMPLTD: 9/18/87

METHOD: H.S.A.

CASE SIZE: 2"

SCREEN INT.: 5-15'

PROTECTION LEVEL: 0

TOC ELEV.: 14.10 FT.

MONITOR INST.: Hnu

TOT DPTH: 15.0 FT.

DPTH TO ∇ 9.50 FT.

LOGGED BY: M. C. Doblin

WELL DEVELOPMENT DATE: 9/18/87

SITE: #8

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0	SS1	1.4/2'		Sand-fine to medium, light tan, shell fragments, dry		SP	7,13,20,29	
5	SS2	1.1/2'		Sand-same as above, interbedded with dark brown shells			13,14,18,7	
YES	SS3	1.8/2'		Sand-same as above, some dark brown			10,10,12,8	
10	SS4	1.4/2'		Sand-top (0.5')/ fine, tan, shells, middle (0.5-0.55')/ blue shells bottom/ fine to medium, graded to light grey, shells			17,17,15,7	
15	SS5	2.0/2'		Sand-same as above, many shells and fragments			17,21,21,37	
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT8D-P1	BORING NO. MPT8D-P1
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/23/92	COMPLTD: 1/23/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 10-15'	PROTECTION LEVEL: 0
TOC ELEV.: 12.89 FT.	MONITOR INST.: FID	TOT DPTH: 15FT.	DPTH TO ∇ 9.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #80

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0 - 5		2/2	7.5	SAND-fine, gray, w/ a few shell fragments	[Dotted pattern]	SP	11,12,11,14	[Well data diagram]
5 - 8.5		1/2	8.5	SAND-as above, saturated				
8.5 - 15				Boring terminated @ 15'				

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-9-1	BORING NO. MPT-9-1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 5087-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/15/87	COMPLTD: 9/15/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 8-18'	PROTECTION LEVEL: 0
TOC ELEV.: 14.38 FT.	MONITOR INST.: Hnu	TOT DPTH: 20.0FT.	DPTH TO ∇ 11.00 FT.
LOGGED BY: M. C. Divilin	WELL DEVELOPMENT DATE: 9/15/87		SITE: #9

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0	SS1	1.55/2'	Sand-top (0.8')/ medium to coarse, light to dark grey, shell fragments bottom/ fine to medium, light tan, shell fragments		SP	7,11,21,27	
1.55	SS2	1.2/2'	Sand-same as above				
2.75	SS3	1.7/2'	Sand-same as above, bottom dark brown, dry			20,22,29,31	
4.45	SS4	1.3/2'	Sand-top (0.8')/ same as above			7,13,14,19	
5.75	SS5	1.8/2'	Clay-uniform, plastic, grey mottled with brown stringers of clay, dry middle (1-1.4')/ fine to medium, white, shell fragments		CL		
7.55			Sandy Clay-grey, plastic, moist		SC	18,21,27,17	
15	SS6	2.0/2'	Sand-fine to medium sand, light gray, shells		SP	8,32,50/ST	

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-9-2	BORING NO. MPT-9-2
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 5097-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/18/87	COMPLTD: 9/18/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 5-15'	PROTECTION LEVEL: 0
TOC ELEV.: 13.38 FT.	MONITOR INST.: Hnu	TOT DPTH: 15.0FT.	DPTH TO ∇ 9.00 FT.
LOGGED BY: M. C. Dible	WELL DEVELOPMENT DATE: 9/18/87		SITE: #9

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
	SS1	1.3/2'				SP	12,12,15,13	
5	SS2	1.5/2'		Sand-same as above			17,9,8,8	
	YES SS3	1.3/2'		Sand-top (0.5')/ fine, tan, shells, middle (0.5-0.55')/ blue shells bottom/ fine to medium, graded to light grey, shells			7,9,12,3	
10	SS4	1.5/2'		Sand-fine to medium, light grey, shells and fragments, saturated			4,8,12,13	
15	SS5	0.4/2'		Sand-same as above			2,12,50/	

TITLE: Mayport Naval Station, Mayport, FL.		LOG of WELL: MPT-9-3	BORING NO. MPT-9-3
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/16/87	COMPLTD: 9/16/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-15'	PROTECTION LEVEL: D
TOC ELEV.: 11.48 FT.	MONITOR INST.: Hnu	TOT DPTH: 15.0FT.	DPTH TO ∇ 9.00 FT.
LOGGED BY: M. C. Oiblin	WELL DEVELOPMENT DATE: 9/16/87		SITE: #9

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
	SS1	15/2'		Sand-fine to medium, uniform, with 0.4' top organic soil and vegetation, bottom/ light tan, shell fragments	[Dotted pattern]	SP	4,13,27,28	[Well diagram showing casing and screen]
	SS2	1.8/2'		Sand-same as above. 0.1' thick clayey sand layer, dry			18,20,20,18	
	SS3	1.5/2'		Sand-same as above, 0.35' thick layer of interbedded brown clay, red sand with shells			22,13,11,12	
5	SS4	1.55/2'					12,8,8,7	
	SS5	1.8/2'		Sand-fine to medium, tan, 50 % shelly, grading very fine, light tan sand at the bottom			7,22,22,35	
10	SS6	2.0/2'		Sand-fine to medium, grey, many shells and fragments			7,11,22,30	
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT9-P1	BORING NO. MPT9-P1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/23/82	COMPLTD: 1/23/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 12-17"	PROTECTION LEVEL: 0
TOC ELEV.: 12.22 FT.	MONITOR INST.: FID	TOT DPTH: 17.0 FT.	DPTH TO ∇ 12 FT.
LOGGED BY: Larry Smith	WELL DEVELOPMENT DATE: N/A		SITE: #9

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				SAND-fine, dk. brown, w/ a few shell fragments		SP		
5		2/2	80	SAND-fine, gray			7,7,7,10	
		2/2	N/A	SAND-as above			11,10,11,12	
10		2/2	N/A	Sand-as above			11,14,11,12	
15		2/2	0.2	SAND-as above, wet			3,4,8,11	
20				Boring terminated @ 17'				
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT10-P1	BORING NO. MPT10-P1
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/28/92	COMPLTD: 1/28/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 10-15'	PROTECTION LEVEL: D
TOC ELEV.: 10.88 FT.	MONITOR INST.: FID	TOT DPTH: 15FT.	DPTH TO \bar{g} 8.0 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #10

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
					SAND-fine, tan, shell fragments		SP		
5			1.8/2	0.2	SAND-as above			7,8,7,9	
10			2/2	0.8	SAND-as above, saturated			4,3,4,4	
15					Boring terminated @ 15'				
20									
25									
30									

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT11-MW-3	BORING NO. MPT11-MW-3
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/24/92	COMPLTD: 1/24/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 7-17"	PROTECTION LEVEL: 0
TOC ELEV.: 9.97 FT.	MONITOR INST.: N/A	TOT DPTH: 17FT.	DPTH TO ∇ 8.0 FT.
LOGGED BY: Larry Smith	WELL DEVELOPMENT DATE: N/A		SITE: #14

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0				SAND-fine to medium, lt. gray, w/ shell fragments	[Dotted pattern]	SP		[Well diagram]
5				SAND-fine to medium, lt. green, saturated				
10								
15								
20				Boring terminated @ 17'				
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.

LOG of WELL: MPT-13-3

BORING NO. MPT-13-3

CLIENT: SOUTHERN DIVISION, NAVFACENCOM

PROJECT NO: 5097-04

CONTRACTOR: MONITOR TESTING

DATE STARTED: 9/18/87

COMPLTD: 9/18/87

METHOD: H.S.A.

CASE SIZE: 2"

SCREEN INT.: 3-10'

PROTECTION LEVEL: 0

TOC ELEV.: 10.45 FT.

MONITOR INST.: Hnu

TOT DPTH: 10.0 FT.

DPTH TO ∇ 3.0 FT.

LOGGED BY: M. C. Doblin

WELL DEVELOPMENT DATE: 9/18/87

SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0 - 1.4	SS1	1.4/2'		Sand- top (0.25')/ dark brown, top soil, middle (2.5-0.8')/ fine to medium, light tan, shells, Fe Oxide layer at 0.8'		SP	40,40,50,30+	
1.4 - 3.0	SS3	1.4/2'	30.2	Sand-top (0.5')/ fine, dark grey, shells middle (0.5-0.8')/ same as above, light grey bottom/ fine, uniform, no shells, saturated			13,15,28,40	
3.0 - 5.1	SS4	2.0/2'	5.1	Clayey Sand- very fine, grey Clay- (0.8-1.1') dark brown, decomposed vegetation / (1.1-1.5') firm, uniform, dark olive / (1.5-2.0) medium plasticity, grey		SC CL	1,1,1,2	

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT13-MW-4	BORING NO. MPT13-MW-4
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/24/82	COMPLTD: 1/24/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 2-12'	PROTECTION LEVEL: D
TOC ELEV.: 9.88 FT.	MONITOR INST.: FID	TOT DPTH: 12FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 1/28/82		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
	MPT-13 -4-3-1	<input checked="" type="checkbox"/>		SAND-fine, brown, loose, very few shell fragments Note: Sample and MS & MSD obtained above water table, 2.5-3.5"		SP		
5			12/2	0			8,10,8,14	
10			2/2	0			11,12,8,8	
15								
20								
25								
30				Boring terminated @ 12'				

TITLE: Mayport Naval Station, Mayport Fl.		LOG of WELL: MPT-13-1	BORING NO. MPT-13-1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 5097-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/18/87	COMPLTD: 9/18/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 3-10'	PROTECTION LEVEL: 0
TOC ELEV.: 13.03 FT.	MONITOR INST.: Hnu	TOT DPTH: 10.0 FT.	DPTH TO ∇ 3.0 FT.
LOGGED BY: M. C. Dible	WELL DEVELOPMENT DATE: 9/18/87		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0-5	SS1	1.4/2'	79.9	Sand-fine to medium, well graded, light tan, shell fragments, dry	[Symbol]	SW	33,42,43,50	[Well Diagram]
5-10	SS3	1.4/2'	132	Sand-top (0.15')/ very fine, brown, shell fragments, bottom (0.15-1.4')/ fine, uniform, light grey, few shells, saturated	[Symbol]	SP	7,9,14,8	
10-15	SS4		70.1	Clayey Sand- top (1')/ very fine interbedded, medium plastic, grey middle (1-1.2')/ uniform, medium plastic, grey Sand-very fine, brown, saturated	[Symbol]	SC CL SP	1,2,2,2	
15-20								
20-25								
25-30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT-13-2	BORING NO. MPT-13-2
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/15/87	COMPLTD: 9/15/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 3-10'	PROTECTION LEVEL: 0
TOC ELEV.: 12.77 FT.	MONITOR INST.: Hnu	TOT DPTH: 10.0FT.	DPTH TO ∇ 3.0 FT.
LOGGED BY: M. C. Doblin	WELL DEVELOPMENT DATE: 9/15/87		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
1.4	SS1			Sand-top (0.25')/ dark brown, top soil, bottom /fine to medium, shell fragments		SP		
1.4 - 2.0	SS2	1.2/2'		Sand-same as above, middle (0.2-0.5')/ medium, tan, many shell fragments (coquina), bottom/ fine, well sorted, uniform, grey	•••	SW	17,31,50/	
2.0 - 3.0	SS3	1.3/2'	1.0	Sand-top (0.2')/ fine to medium, light grey, shell fragments, middle (0.2-0.45')/ dark brown sandy peat, saturated, (0.45-0.8')/fine, light grey, with shell fragments, bottom/ fine, uniform, no shells		SP	9,12,22,27	
3.0 - 4.0	SS4	2.0/2'	1.5	Sand-same as above			4,4,8,8	
4.0 - 10.0				Clay- (0.3-1')/ soft, plastic, uniform, grey, (1-1.8')/ stiff, dark brown, with mud dump vegetation, bottom/ stiff, uniform, dark olive		CL		

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT13-MW-5	BORING NO. MPT13-MW-5
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/24/92	COMPLTD: 1/24/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 3-13'	PROTECTION LEVEL: D
TOC ELEV.: 10.04 FT.	MONITOR INST.: FID	TOT DPTH: 13FT.	DPTH TO ∇ 5.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: 1/28/92		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
	MPT-13 -5-3-1	<input checked="" type="checkbox"/>		SAND-fine, tan, w/ shell fragments		SP		
				Note: Sampled approximately 3.5'				
5		2/2	20	SAND-fine, gray, w/ shell fragments, saturated			4,3,2,3	
10		2/2	N/A				3,2,3,3	
				CLAY-black, organic, low plasticity		OL		
15				Boring terminated				
20								
25								
30								

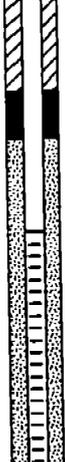
TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT13-MW-8	BORING NO. MPT13-MW-8
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/24/82	COMPLTD: 1/24/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 2-12'	PROTECTION LEVEL: 0
TOC ELEV.: 8.88 FT.	MONITOR INST.: FID	TOT DPTH: 12FT.	DPTH TO ∇ N/A FT.
LOGGED BY: Larry Smith	WELL DEVELOPMENT DATE: 1/28/82		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5	MPT-13 8-2.5-1	<input checked="" type="checkbox"/>		<p>SAND-very fine to fine, tan to gray, w/ shell fragments</p> <p>Note: Sampled by hand with decontaminated stainless steel spoon @ 2.5'</p> <p>Due to location of well on the flight ramp and active flight operation, samples were not obtained. Observation of drill cuttings indicate saturated fine tan to gray sands to 12'.</p>		SP		
15				Boring terminated @ 12'				
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT13-P1	BORING NO. MPT13-P1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/92	COMPLTD: 1/18/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: D
TOC ELEV.: 11.03 FT.	MONITOR INST.: FID	TOT DPTH: 10FT.	DPTH TO ∇ 5.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0				SAND-fine, tan, w/ shell fragments		SM		
5		1.7/2	4.0	SAND-fine, tan, saturated over 1' of SAND-very fine to silty, gray, w/ shell fragments			4.2.1-	
10				Boring terminated @ 10'				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT13-P3	BORING NO. MPT13-P3
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/92	COMPLTD: 1/18/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 5-10'	PROTECTION LEVEL: D
TOC ELEV.: 10.18 FT.	MONITOR INST.: FID	TOT DPTH: 10FT.	DPTH TO ∇ 5.0 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5		2/2	22	SAND-very fine to fine, tan, w/ coarse shell fragments		SP		
5				SAND-silty, gray, w/ a trace of shell fragments		SM	4.4,2.2	
10				Boring terminated @ 10'				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT13-P4	BORING NO. MPT13-P4
CLIENT: SOUTHERN DIVISION, NAVFACENGC0M		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 5-10'	PROTECTION LEVEL: 0
TOC ELEV.: 9.31 FT.	MONITOR INST: FID	TOT DPTH: 10FT.	DPTH TO ∇ 5.0 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A	SITE: #13	

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
				SAND-fine, black, organic		ML		
				SAND-very fine to fine, tan, w/ abundance of shell fragments		SP		
5		12/2	8.0	SAND-very fine to fine, gray, saturated			8,5,5,8	
10				Boring terminated @ 10'				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT13-P5	BORING NO. MPT13-P5
CLIENT: SOUTHERN DIVISION, NAVFACENCOM			PROJECT NO: 7533-81
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/92	COMPLTD: 1/18/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: D
TOC ELEV.: 8.45 FT.	MONITOR INST.: PID	TOT DPTH: 10FT.	DPTH TO ∇ 4.0 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0 - 5				SAND-fine, tan, w/ shell fragments	[Dotted Pattern]	SP		[Well Diagram]
5 - 10		1.0/2	0.3	SAND-very fine to silty, gray, w/ shell fragments, saturated	[Diagonal Lines]	SM	10,2,1,2	[Well Diagram]
10 - 30				Boring terminated @ 10'				[Well Diagram]

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT13-P6	BORING NO. MPT13-P6
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/92	COMPLTD: 1/18/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: 0
TOC ELEV.: 10.18 FT.	MONITOR INST.: FID	TOT DPTH: 10FT.	DPTH TO ∇ 3.50 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0				SAND-fine, gray, abundant shell fragments		SP		
5		13/2	0	SAND-fine, gray, abundant shell fragments, saturated			9,15,18,18	
10				boring terminated @10'				
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT-14-1	BORING NO. MPT-14-1
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM			PROJECT NO: 5087-04
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/17/87	COMPLTD: 9/17/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 3-12'	PROTECTION LEVEL: 0
TOC ELEV.: 7.41 FT.	MONITOR INST.: Hnu	TOT DPTH: 13.0 FT.	DPTH TO ∇ 3.0 FT.
LOGGED BY: M. C. Dible	WELL DEVELOPMENT DATE: 9/17/87		SITE: #14

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0	SS1	1.4/2'		Sand-fine to medium, light tan, with few shell fragments, visible layering, dry	[Dotted pattern]	SP	7,14,20,28	[Well diagram showing casing and screen]
5	SS3	1.4/2'	180	Sand-same as above, saturated			9,18,31,50	
10	SS4	2.0/2'	141	Sand-fine to medium, uniform sand with shell fragments, saturated			7,23,50/5in	
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT-14-2	BORING NO. MPT-14-2
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 5097-04	
CONTRACTOR: MONITOR TESTING		DATE STARTED: 9/17/87	COMPLTD: 9/17/87
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 3-13'	PROTECTION LEVEL: D
TOC ELEV.: 8.47 FT.	MONITOR INST.: Hnu	TOT DPTH: 12.0FT.	DPTH TO ∇ 3.0 FT.
LOGGED BY: M. C. Dible	WELL DEVELOPMENT DATE: 9/17/87		SITE: #14

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
	SS1	18/2'	80.2	Sand-fine, uniform with layering, light tan bottom/ dark tan, some shell fragments, visible bedding	[Dotted pattern]	SP	7,12,20,30	[Well data column with patterns]
YES	SS2	15/2'	49.7	Sand-fine, uniform, light tan, dry, bottom/ some shell fragments			7,20,25,27	
5	SS3	15/2'	59.8	Sand-fine, uniform, light grey, middle/ shelly, gravelly sand, saturated, bottom/ fine to medium, light grey, saturated			5,18,28,50	
10	SS4	18/2'	4.8	Sand-fine to medium, light gray, saturated, shell fragments			11,31,50/3cm	
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT14-PI	BORING NO. MPT14-PI
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: 0
TOC ELEV.: 8.50 FT.	MONITOR INST.: FID	TOT DPTH: 10FT.	DPTH TO ∇ 5.00 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: N/A		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0 - 5					SAND-fine to coarse, brown to tan, loose	[stippled symbol]	SP		
5 - 10			2/2	2	CLAY-olive green, high water content, first 8" over SAND-very fine to fine, gray	[horizontal lines symbol]	CL SP	12,8,8,10	[diagonal lines symbol]
10 - 30					Boring terminated @ 10'				

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT14-P2	BORING NO. MPT14-P2
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/18/82	COMPLTD: 1/18/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 8-11'	PROTECTION LEVEL: 0
TOC ELEV.: 5.71 FT.	MONITOR INST: FID	TOT DPTH: 11 FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: Pat Craine	WELL DEVELOPMENT DATE: N/A		SITE: #13

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
				SAND-very fine to silty, tan, w/ large pieces of glass		SM		
5		2/2	N/A	SAND-very fine to silty, tan, some shell fragments, saturated			7,7,8,20	
				SAND-very fine to silty, tan, w/ trace CLAY, olive green		SC		
				Boring terminated @ 11'				
10								
15								
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT15-PI	BORING NO. MPT15-PI
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/28/92	COMPLTD: 1/28/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 10-15'	PROTECTION LEVEL: 0
TOC ELEV.: 13.28 FT.	MONITOR INST.: FID	TOT DPTH: 15FT.	DPTH TO ∇ 9.5 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #15

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5		1.5/2	1.2	SAND-fine, tan, loose w/ shell fragments		SP	4,12,10,11	
10		2/2	0.8	SAND-fine to silty, dk. gray, a few shell fragments, saturated		SM	3,4,8,8	
15	Boring terminated @ 15'							
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.		LOG of WELL: MPT17-P1	BORING NO. MPT17-P1
CLIENT: SOUTHERN DIVISION, NAVFACENCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/28/82	COMPLTD: 1/28/82
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT.: 5-10'	PROTECTION LEVEL: 0
TOC ELEV.: 7.97 FT.	MONITOR INST.: FID	TOT DPTH: 10FT.	DPTH TO ∇ 4.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #17

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
0-5					SAND-fine, tan, loose		SP		
5-10			15/2	1.2	Shell fragments w/ approx. 20% SAND-fine, tan, wet		SP	3.5, 9, 14	
10-30					Boring terminated @ 10'				

TITLE: Mayport Naval Station, Mayport, FL		LOG of WELL: MPT17-P2	BORING NO. MPT17-P2
CLIENT: SOUTHERN DIVISION, NAVFACENGCOM		PROJECT NO: 7533-81	
CONTRACTOR: GROUNDWATER PROTECTION, INC.		DATE STARTED: 1/28/92	COMPLTD: 1/28/92
METHOD: H.S.A.	CASE SIZE: 2"	SCREEN INT: 7-12'	PROTECTION LEVEL: 0
TOC ELEV.: 7.72 FT.	MONITOR INST.: FID	TOT DPTH: 12FT.	DPTH TO ∇ 7.00 FT.
LOGGED BY: Randy Holloway	WELL DEVELOPMENT DATE: N/A		SITE: #17

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5		15/2	0.2	SAND-fine, brown, loose, w/ some shell fragments	[Dotted pattern]	SP	10,8,8,8	[Well data diagram]
10		19/2	0.2	SAND-fine, brown, w/ shell fragments, saturated			8,7,8,8	
15				Boring terminated @ 12'				
20								
25								
30								

TITLE: Mayport Naval Station, Mayport, Fl.

LOG of WELL: MPT22-MW-1S

BORING NO. MPT22-MW-1S

CLIENT: SOUTHERN DIVISION, NAVFACENCOM

PROJECT NO: 7533-81

CONTRACTOR: GROUNDWATER PROTECTION, INC.

DATE STARTED: 1/24/82

COMPLTD: 1/24/82

METHOD: H.S.A.

CASE SIZE: 2"

SCREEN INT.: 2-12'

PROTECTION LEVEL: 0

TOC ELEV.: 7.15 FT.

MONITOR INST.: FID

TOT DPTH: 12FT.

DPTH TO ∇ 2.5 FT.

LOGGED BY: Larry Smith

WELL DEVELOPMENT DATE: 1/28/82

SITE: #22

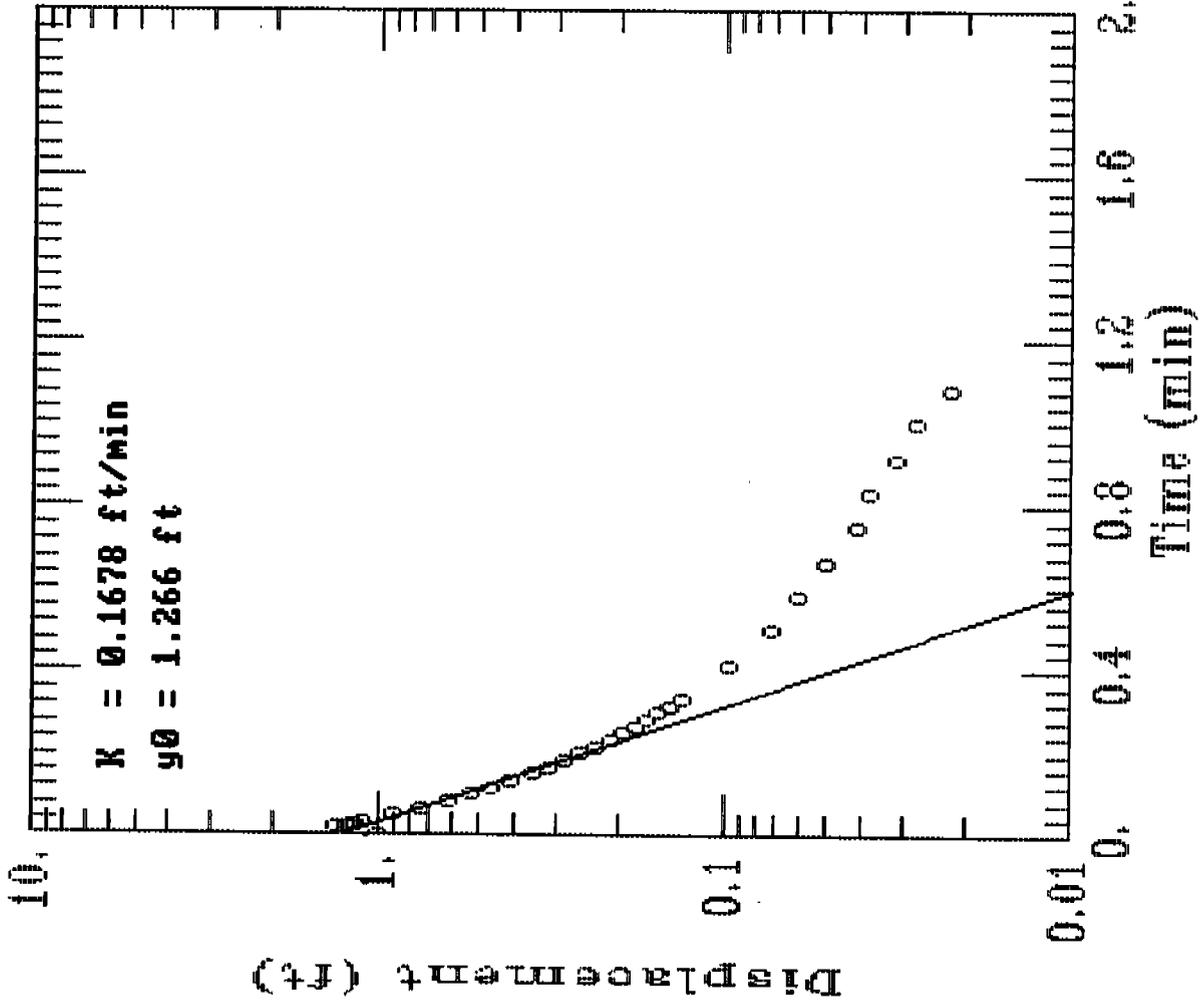
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5					SAND—fine to medium, lt. gray to tan, numerous shell fragments		SP		
10					CLAY—sandy, silty, gray to dk. green, organics, some shell fragments		CL		
15					Boring terminated @ 12'				
20									
25									
30									

APPENDIX B

**HYDROLOGICAL DATA
(SLUG TEST DATA AND GROUNDWATER ELEVATIONS DATA)**

MAYPORT NAVAL STATION MPT-1-P1-S1



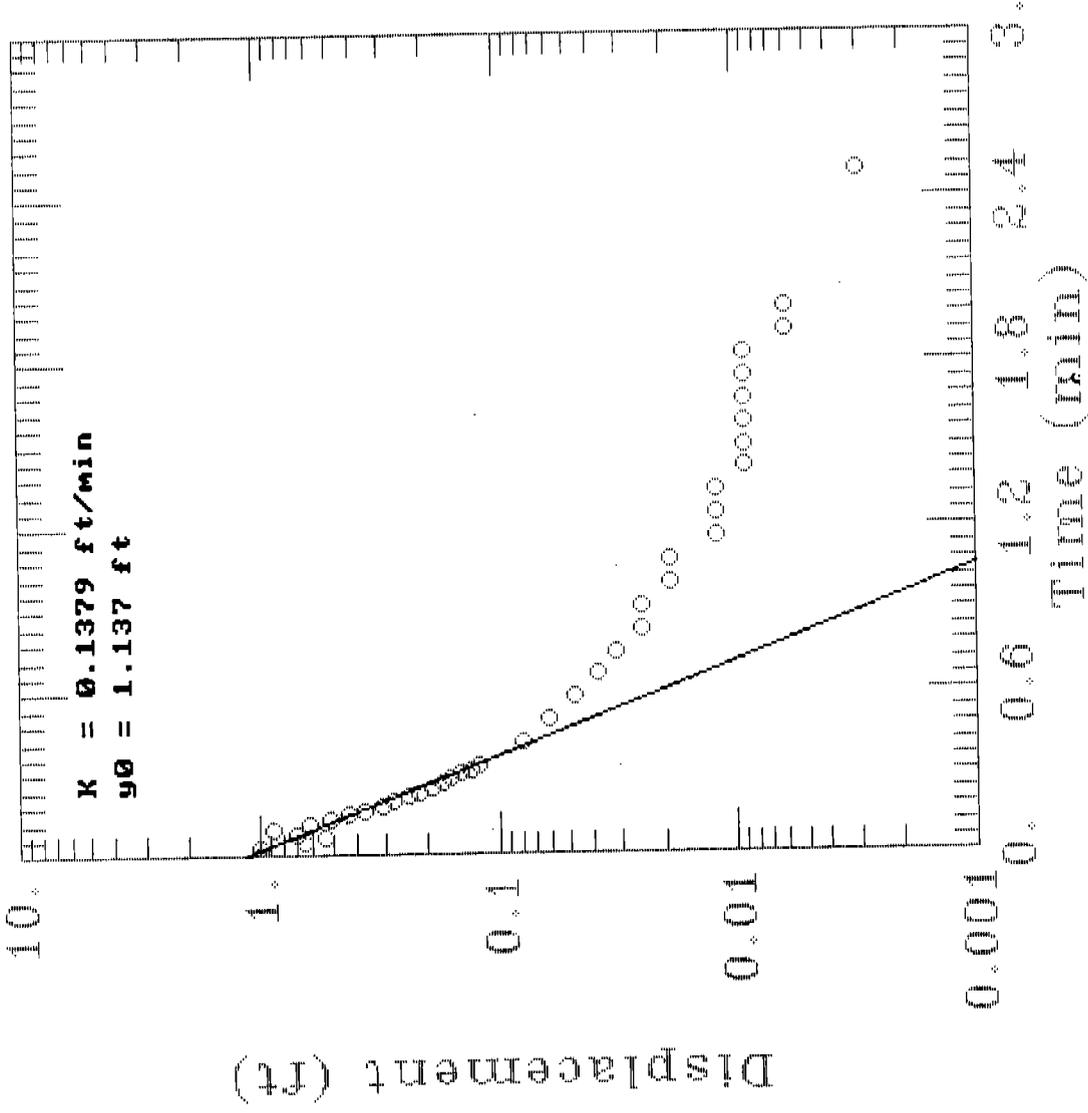
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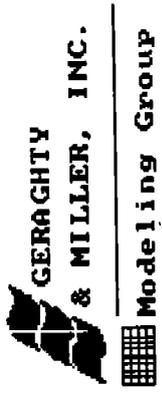
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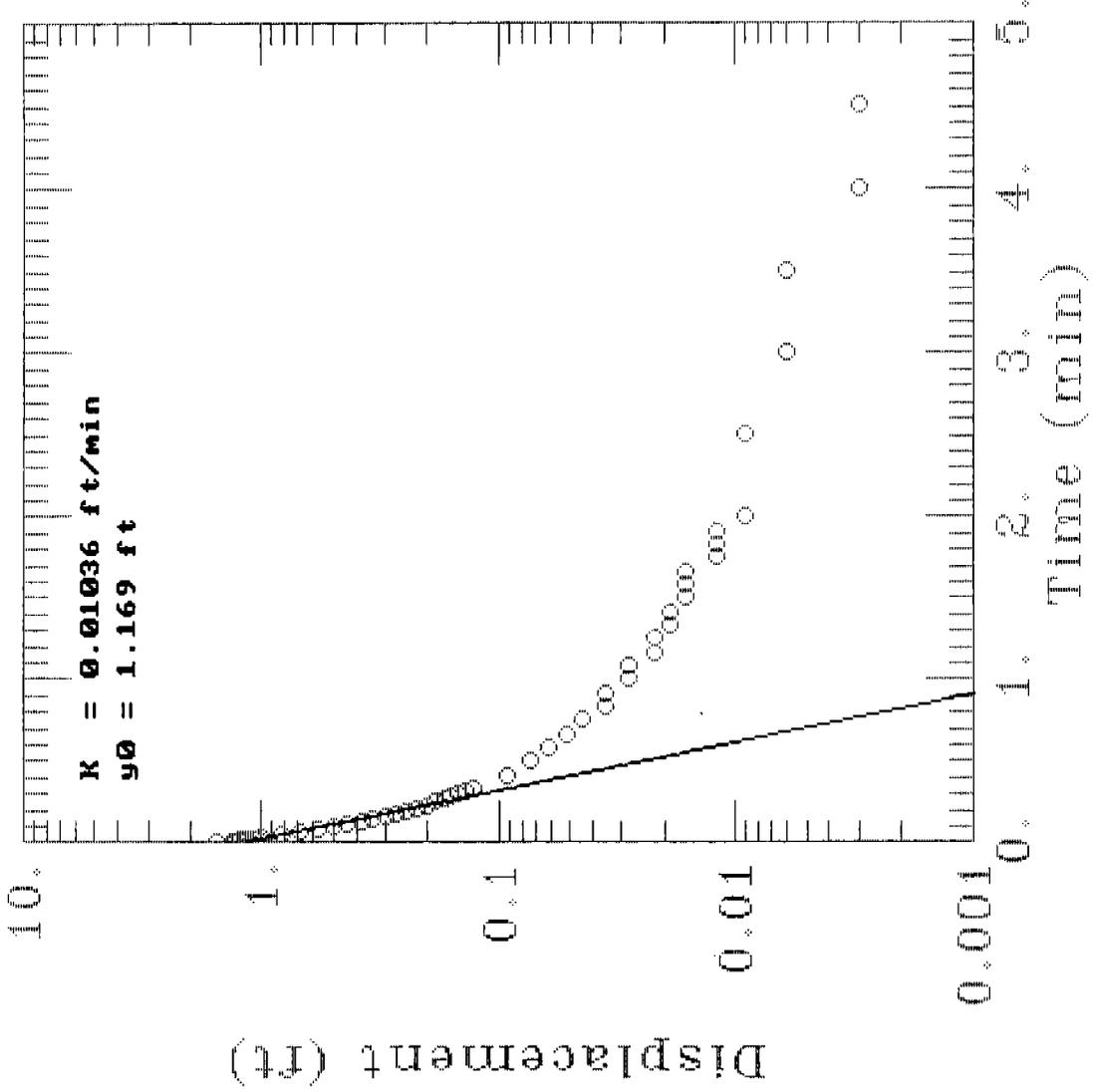
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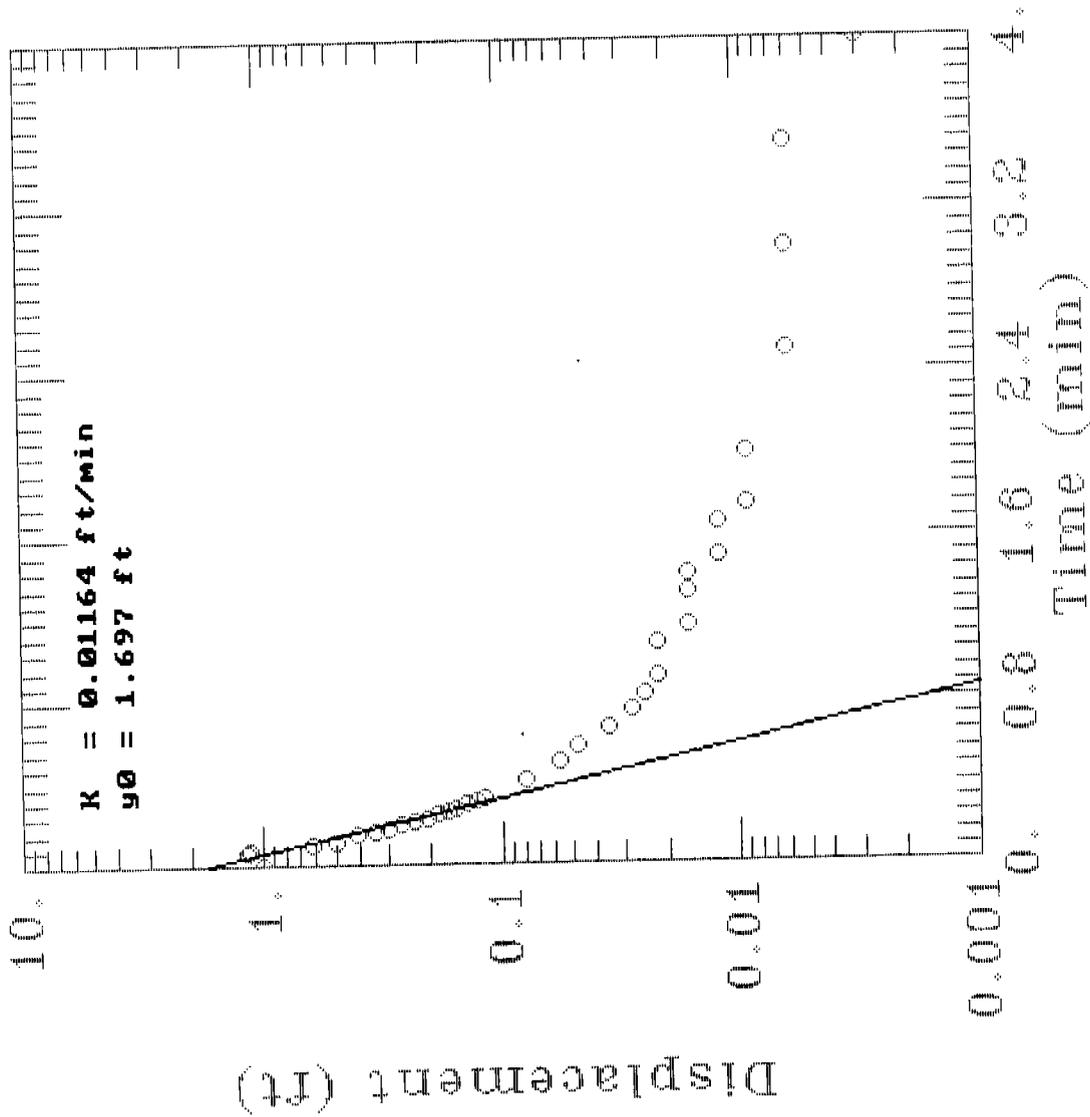


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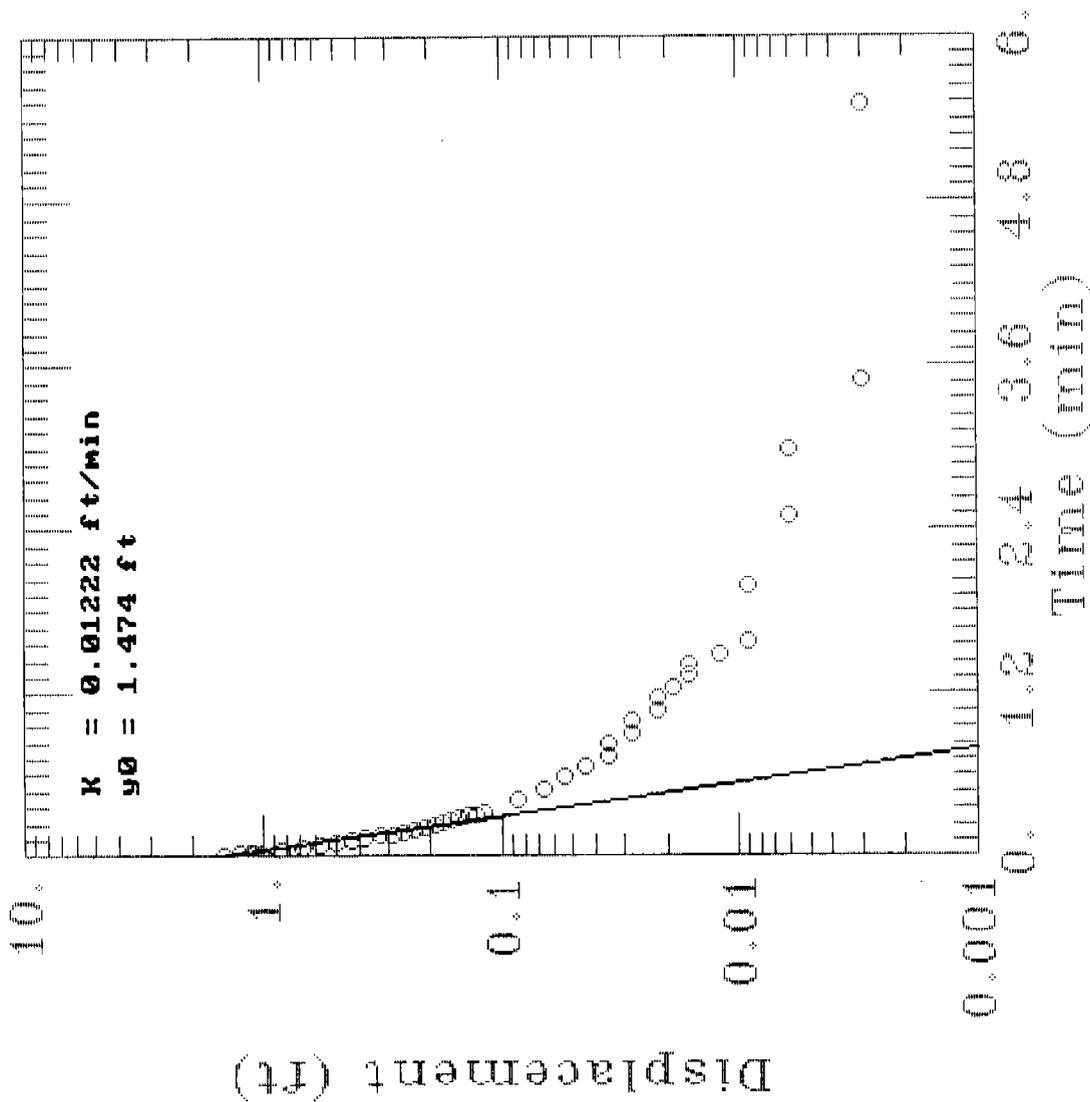


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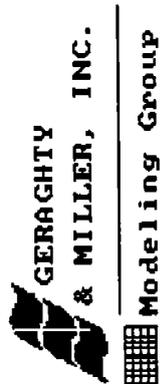
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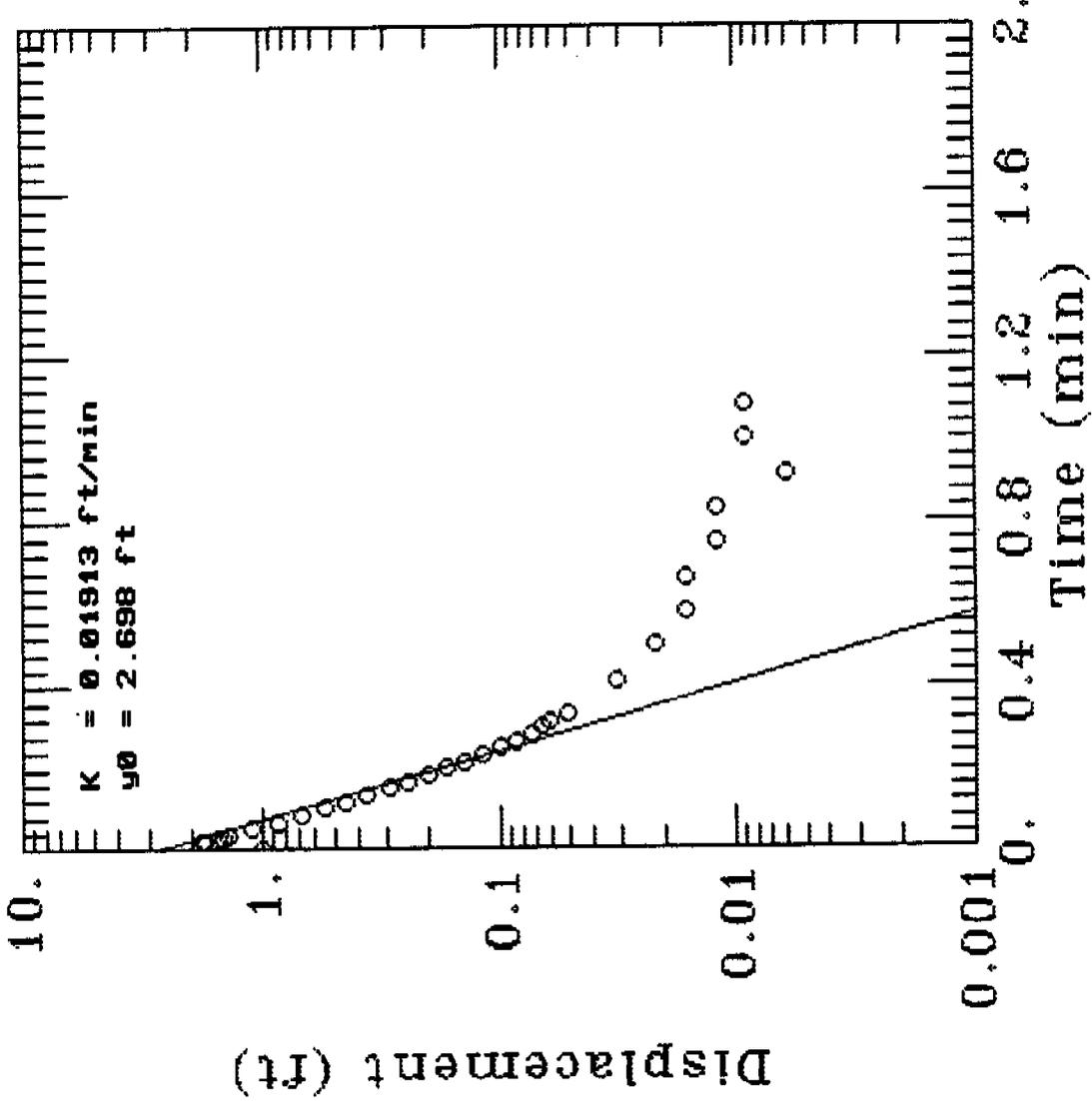
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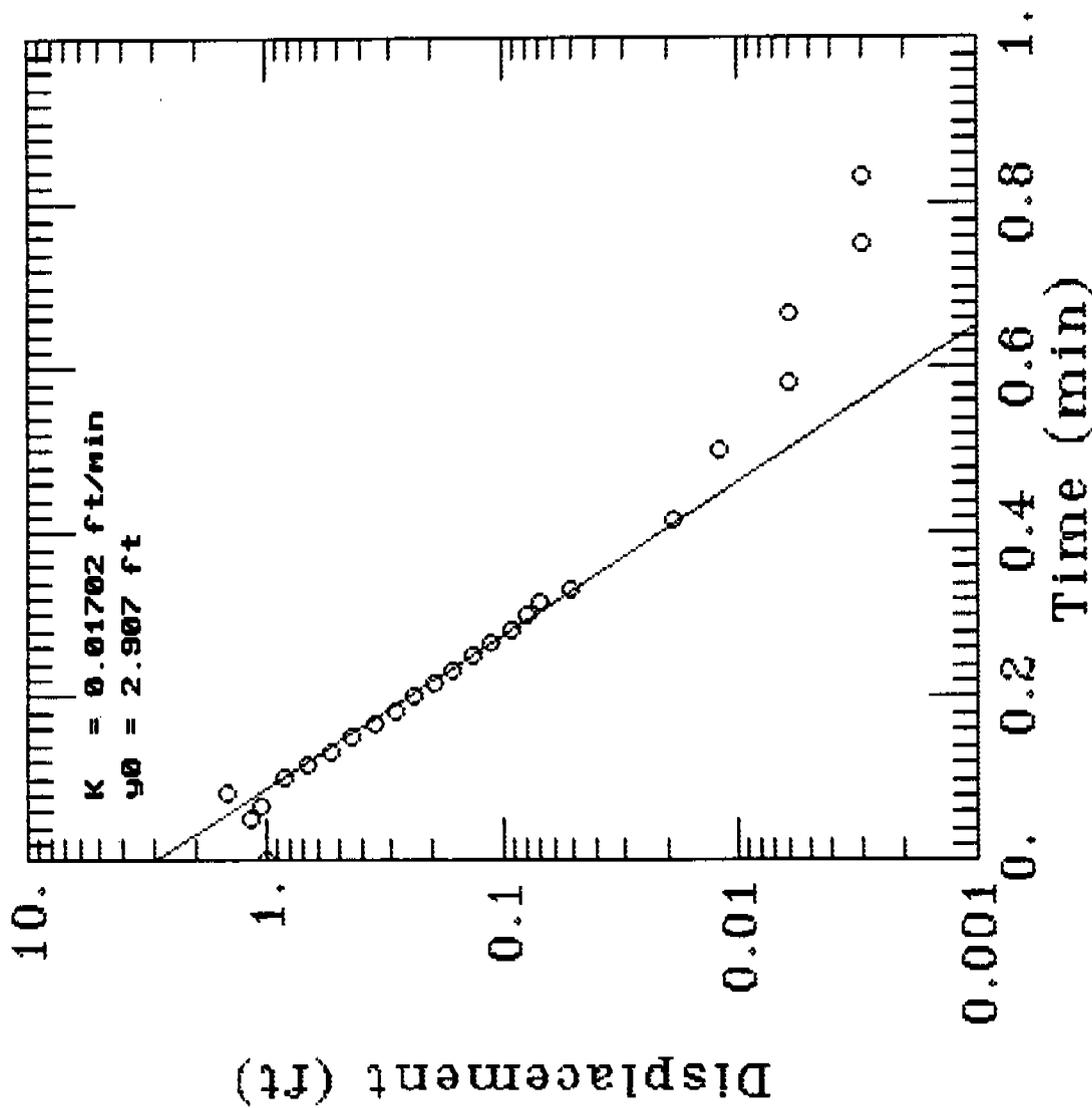


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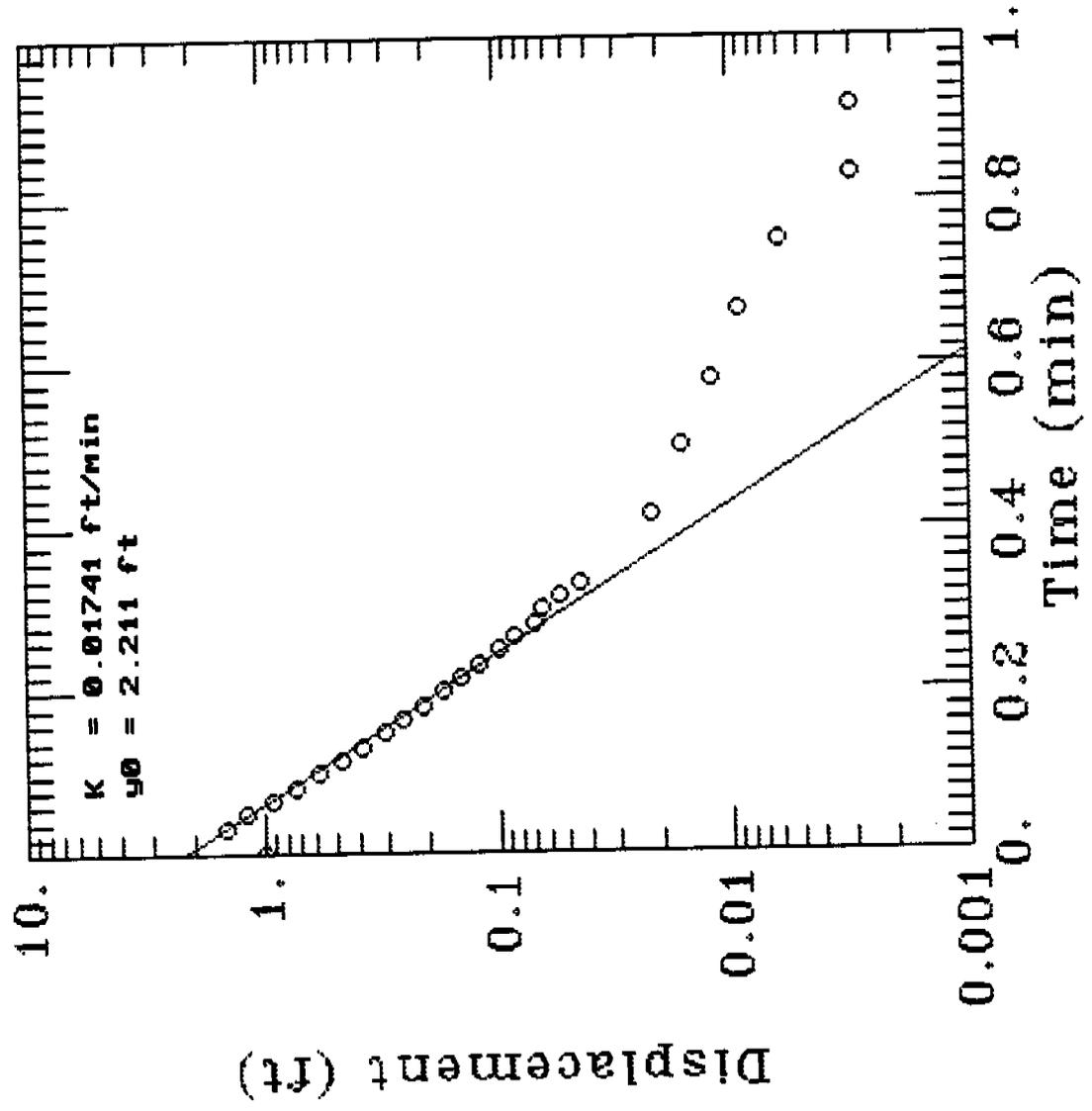
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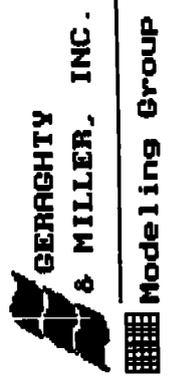
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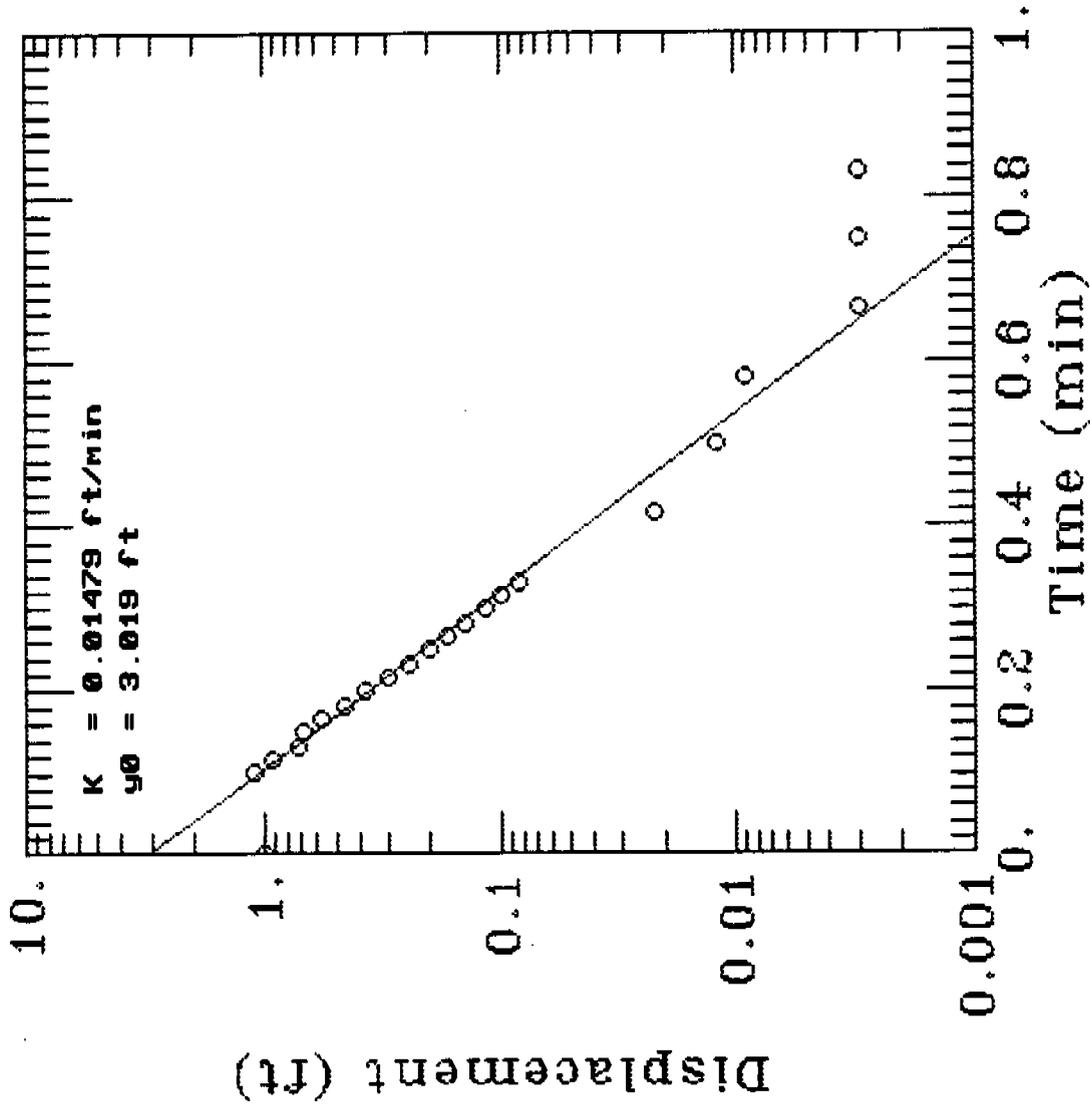
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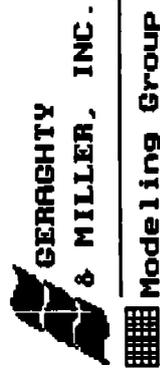
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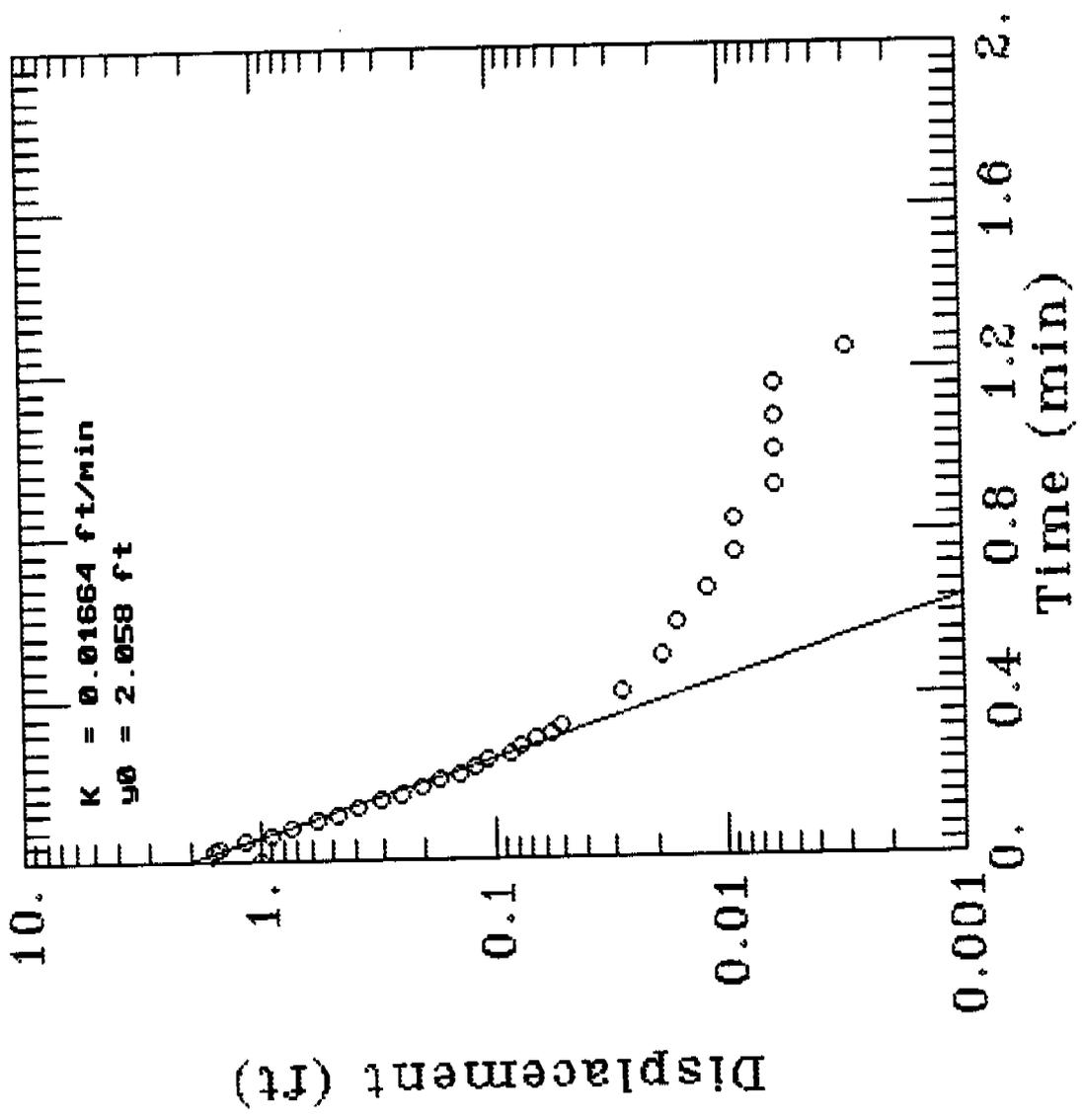
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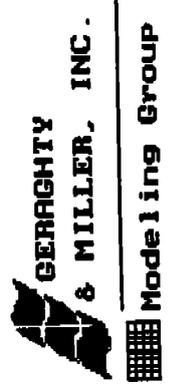
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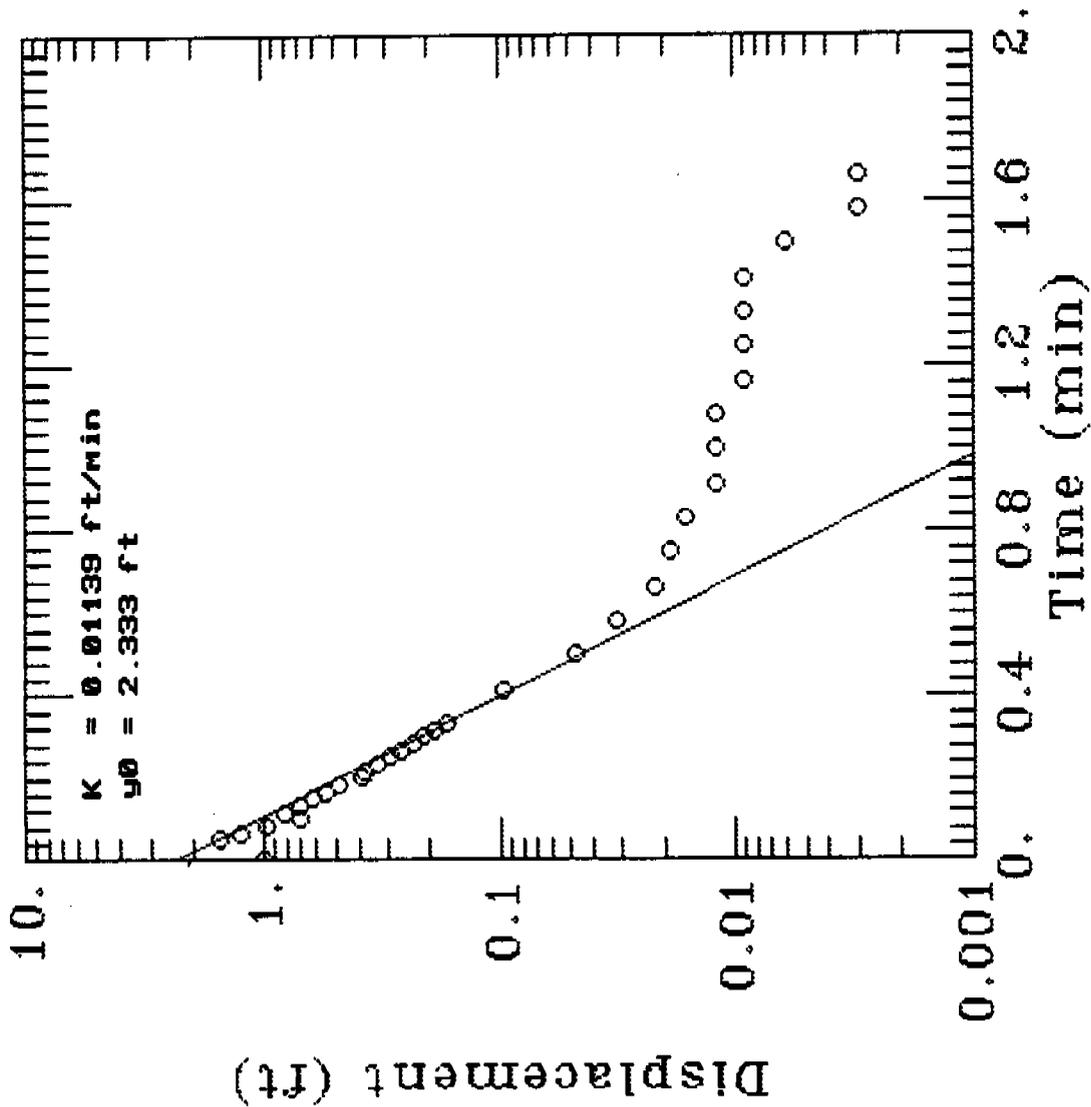
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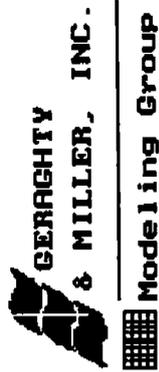
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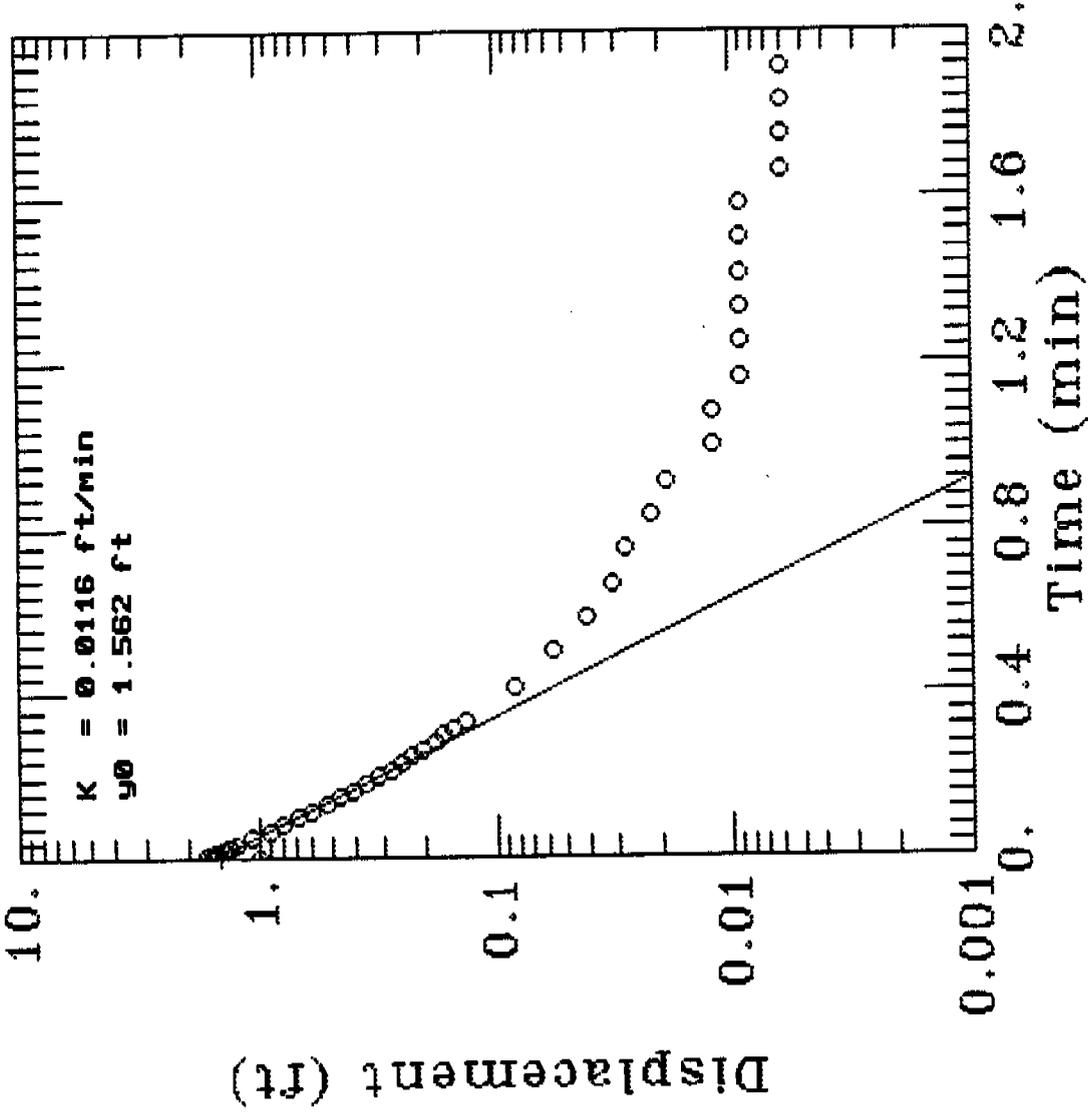
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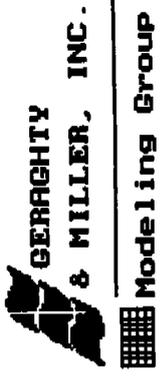
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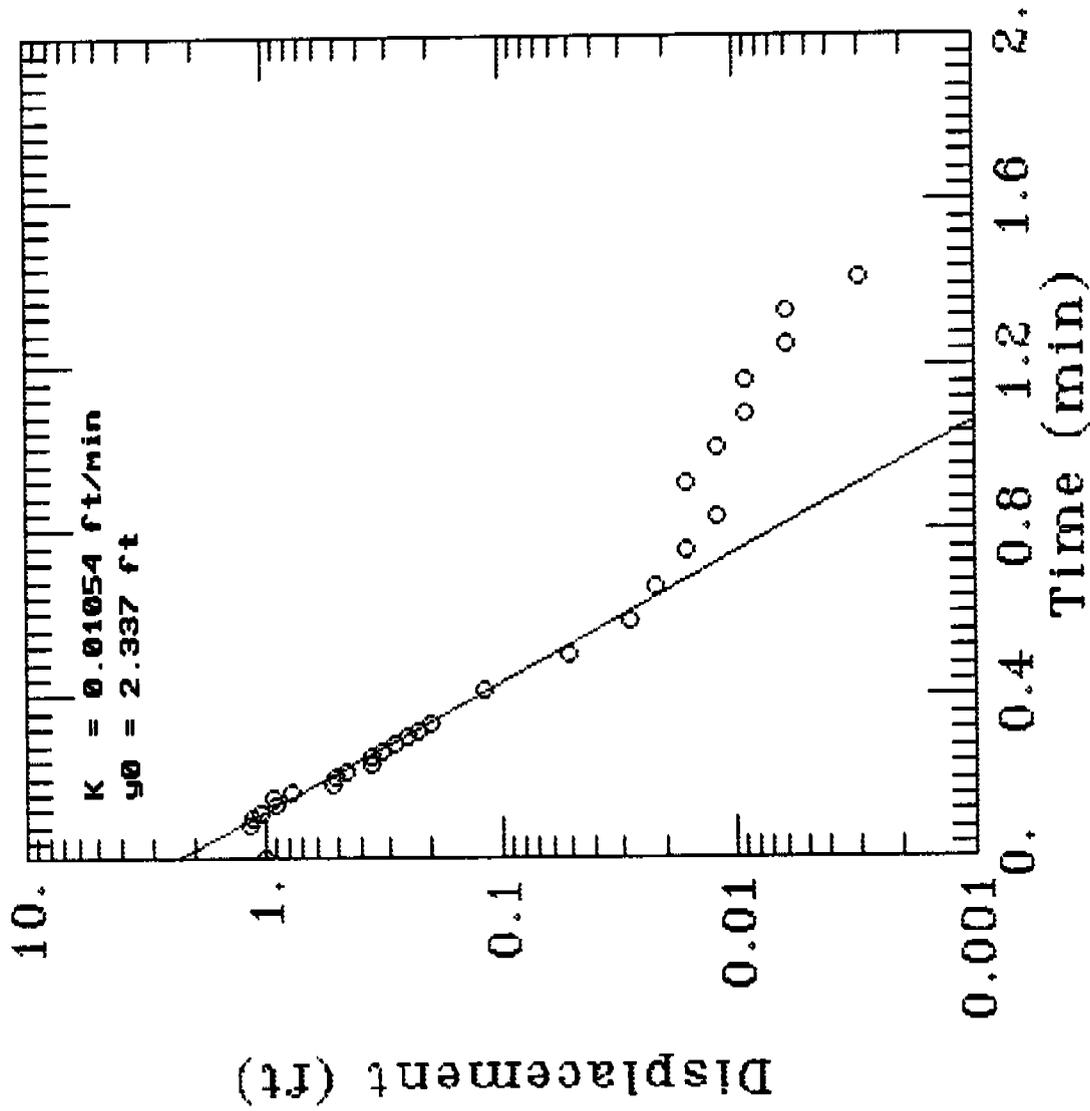
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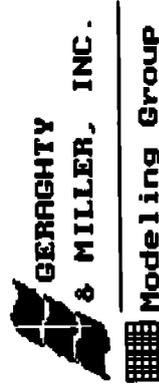
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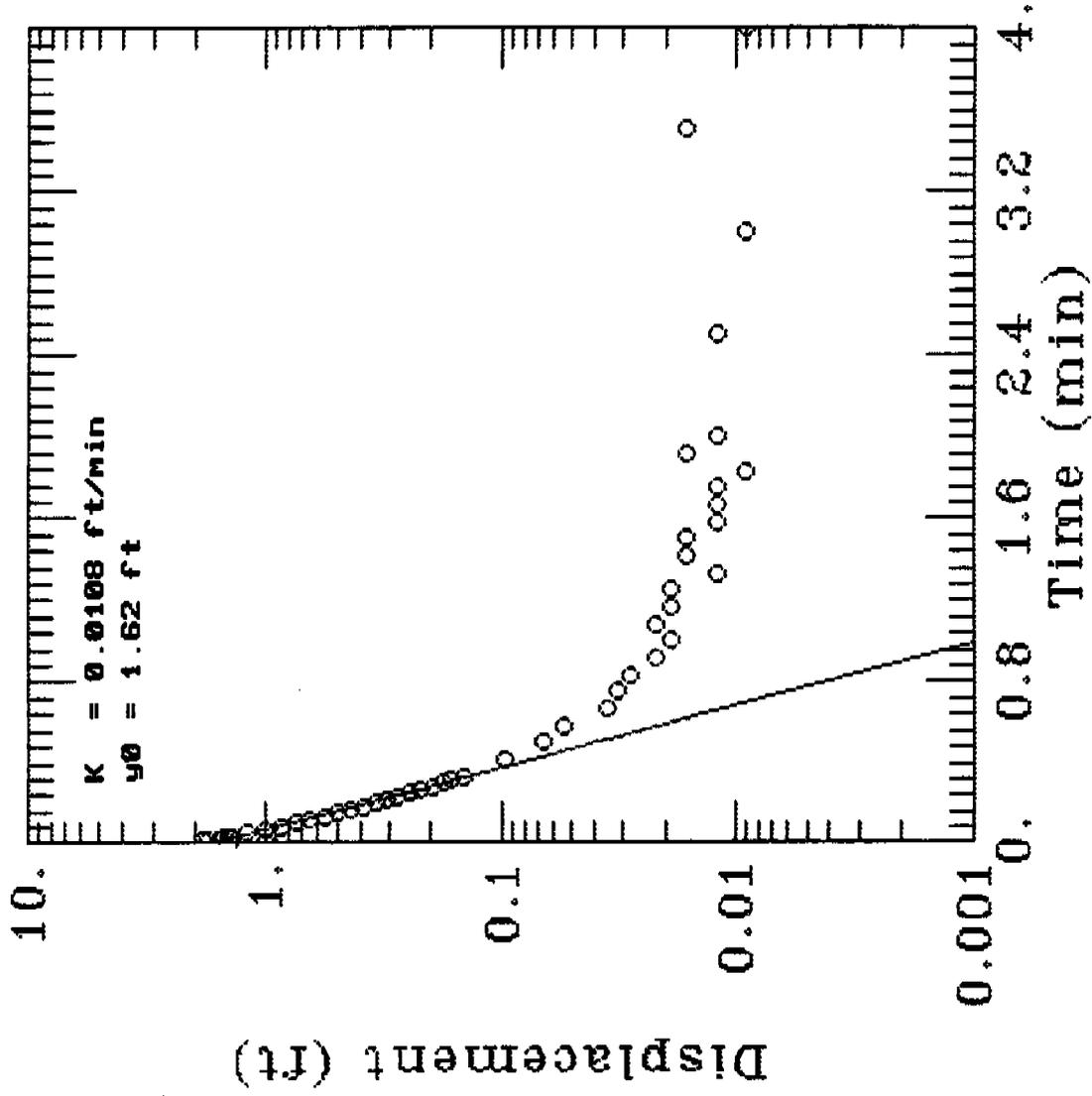
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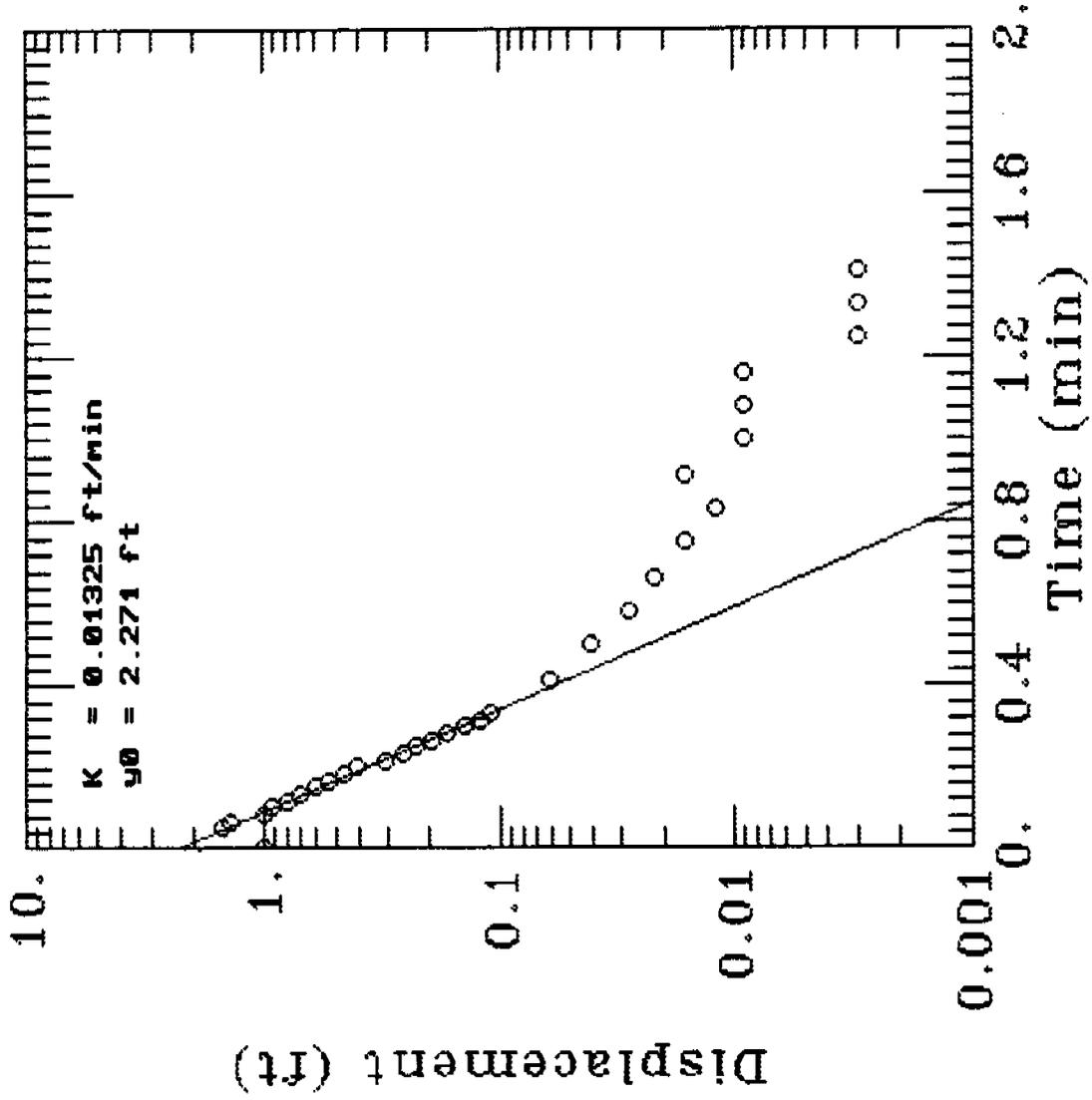


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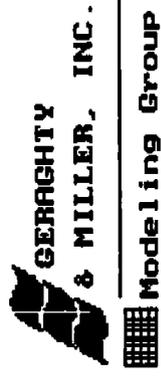
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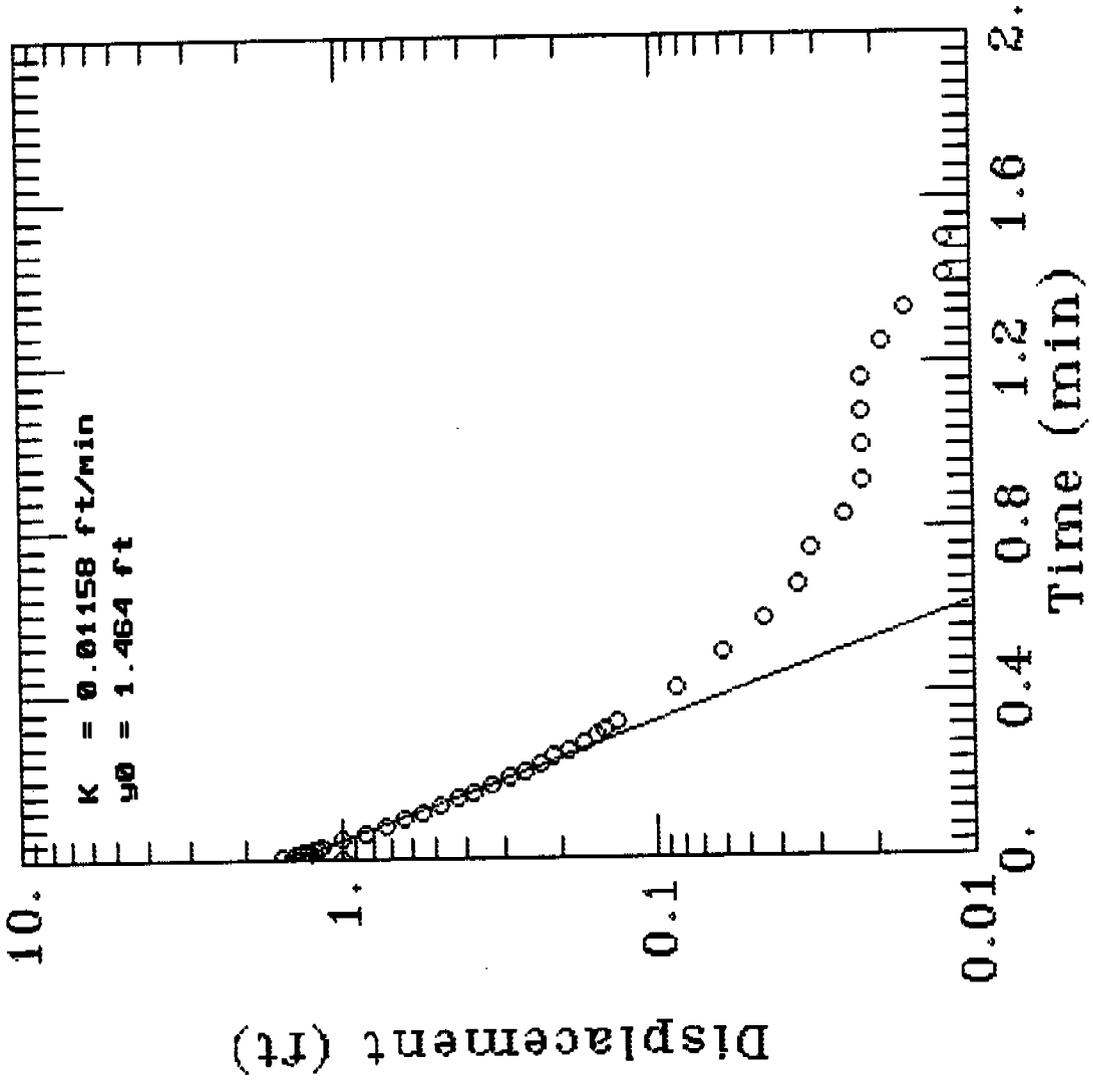
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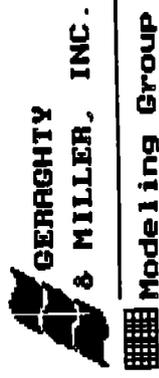
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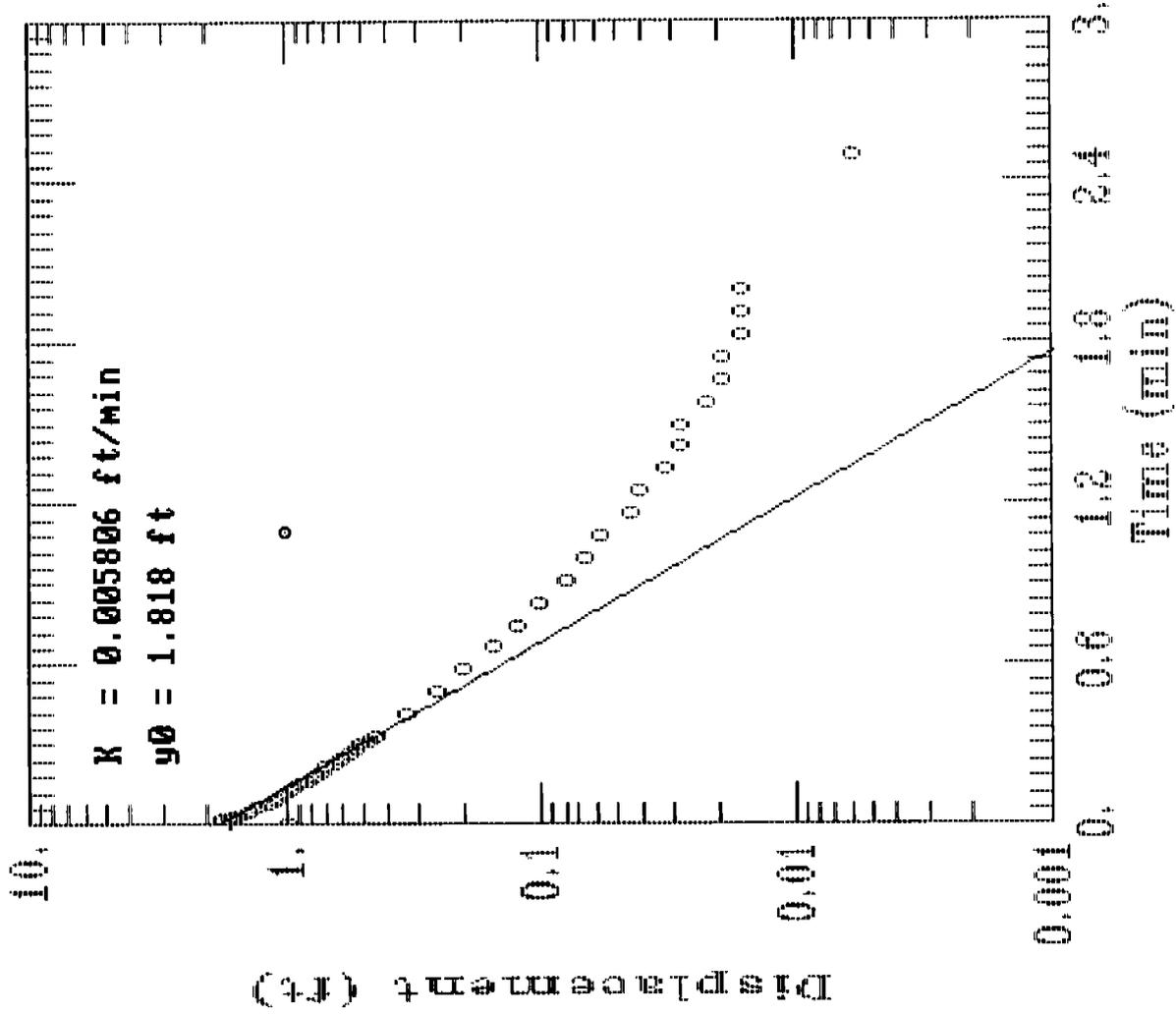
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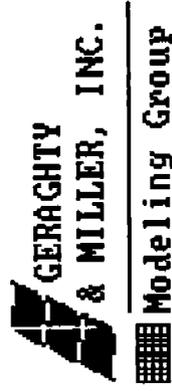
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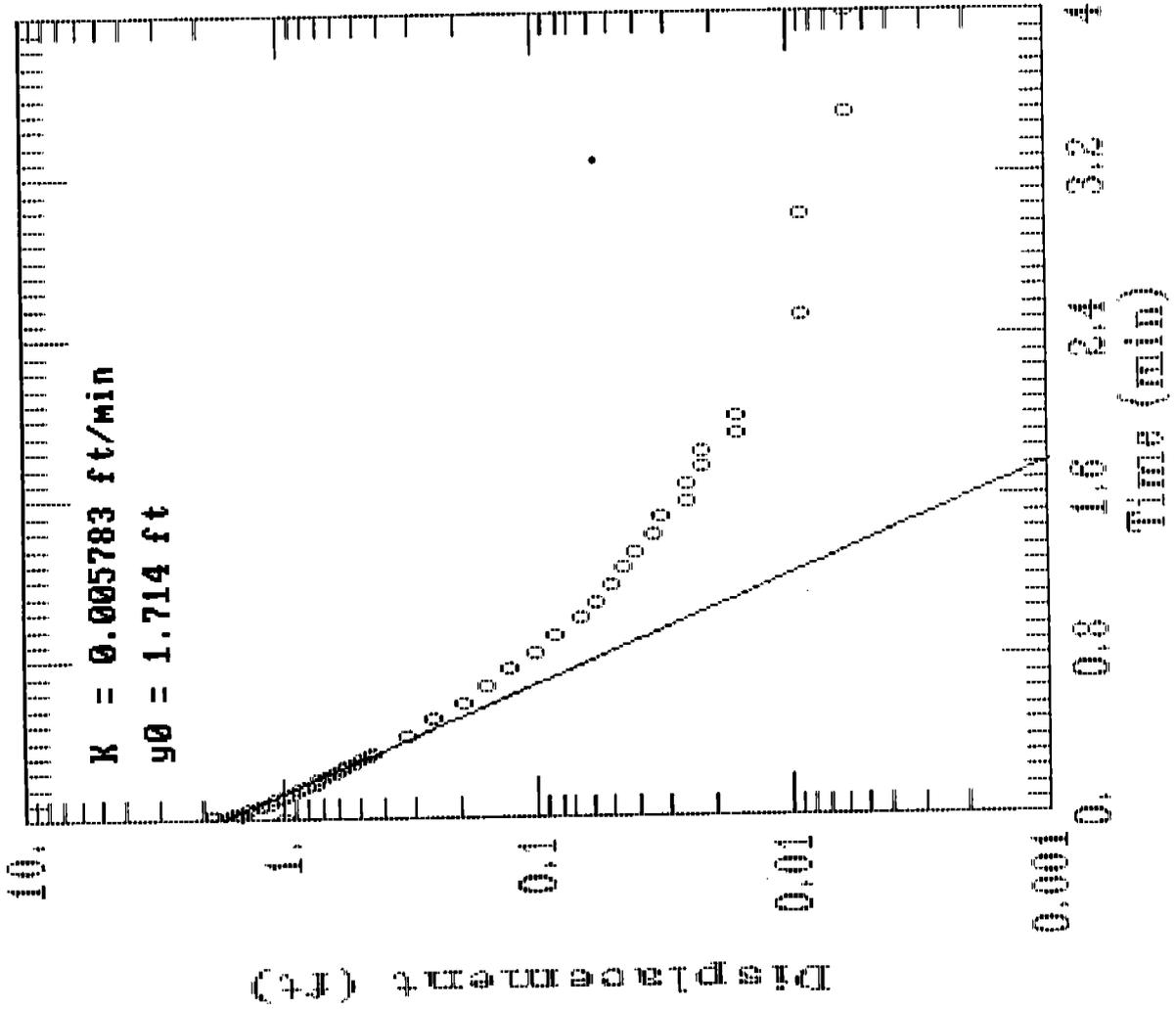
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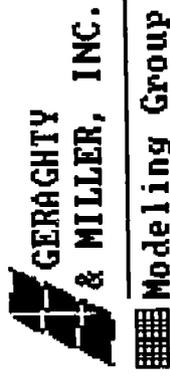
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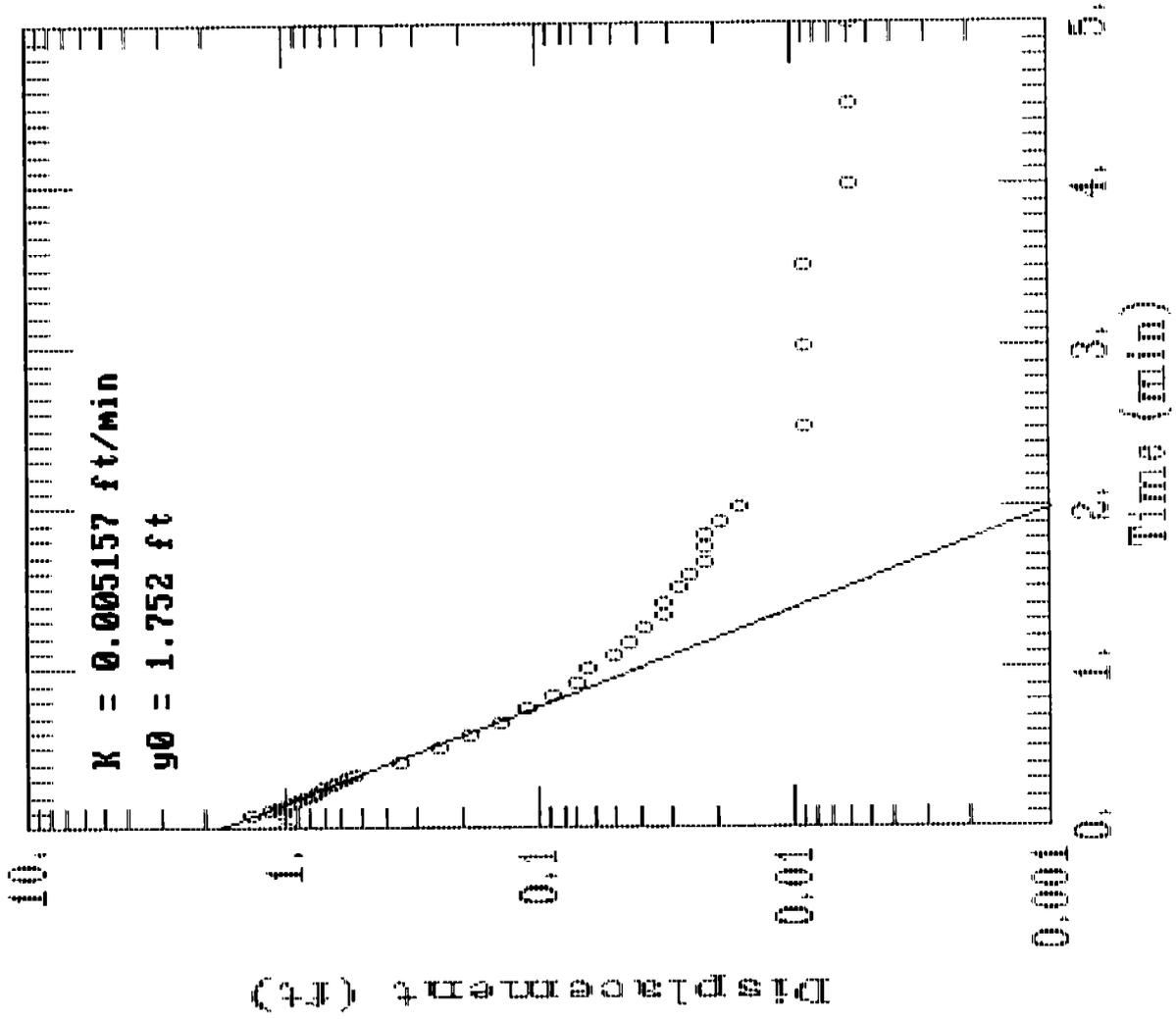
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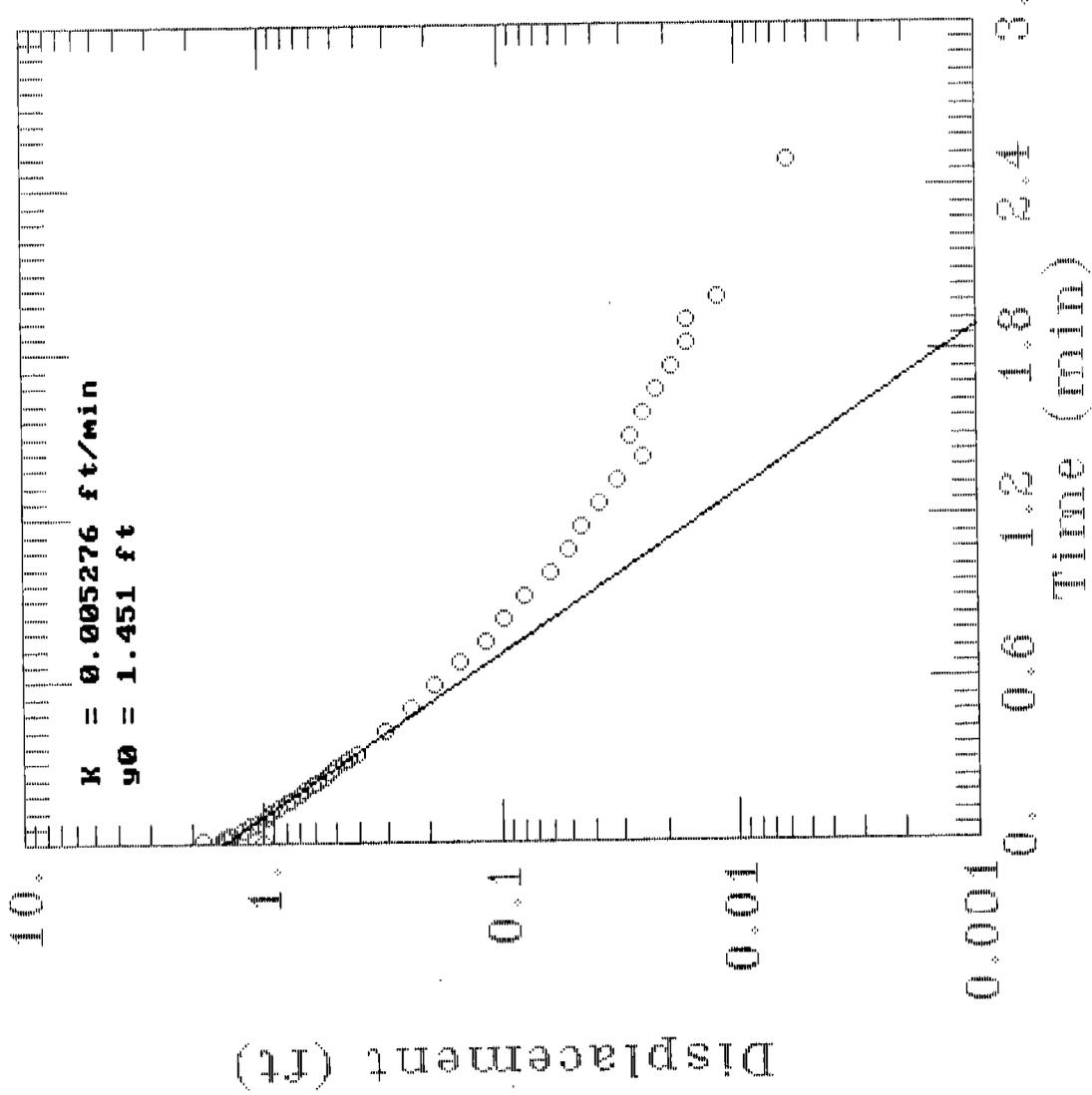


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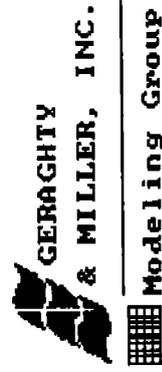
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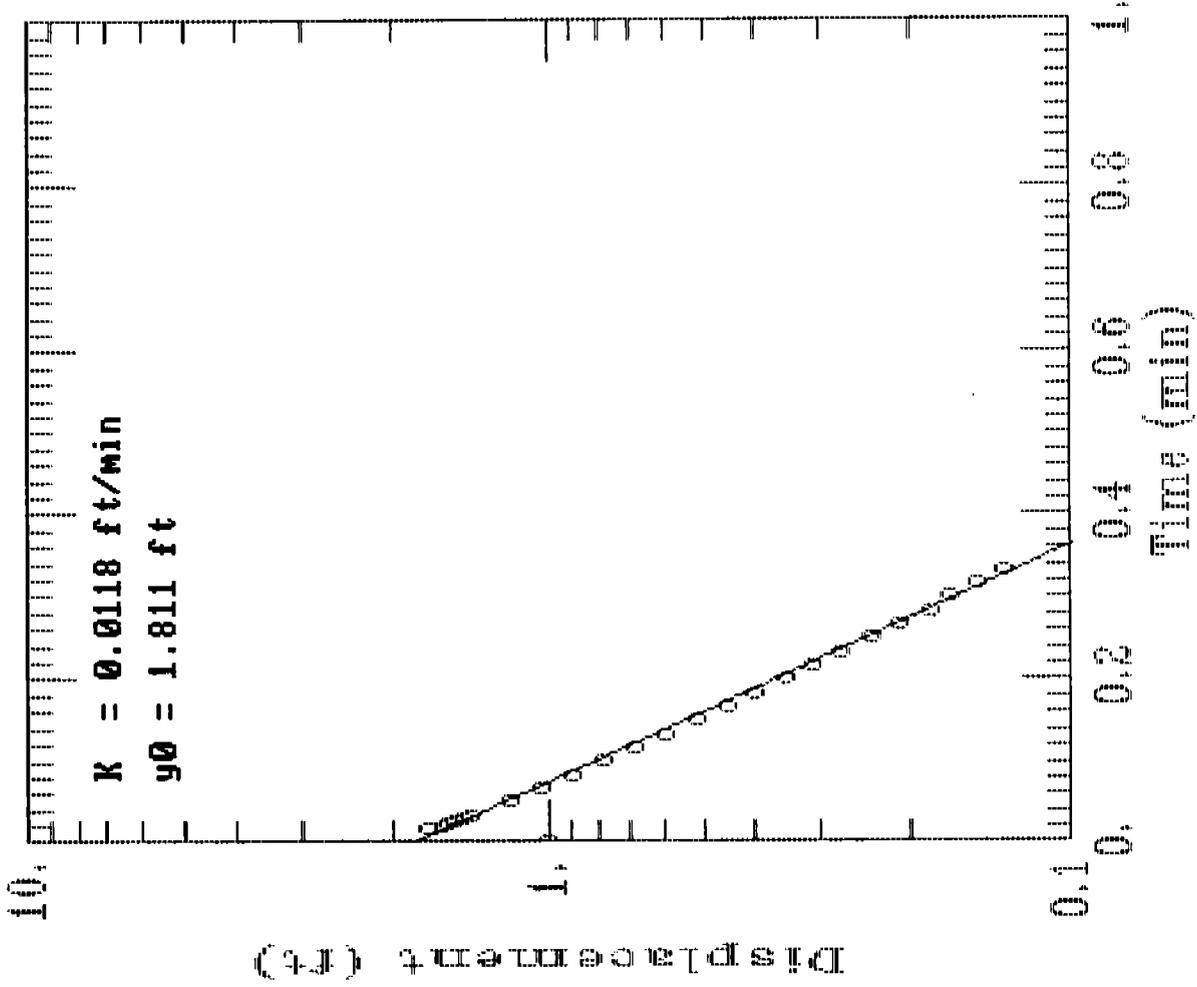
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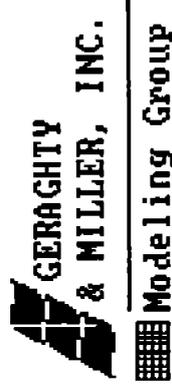
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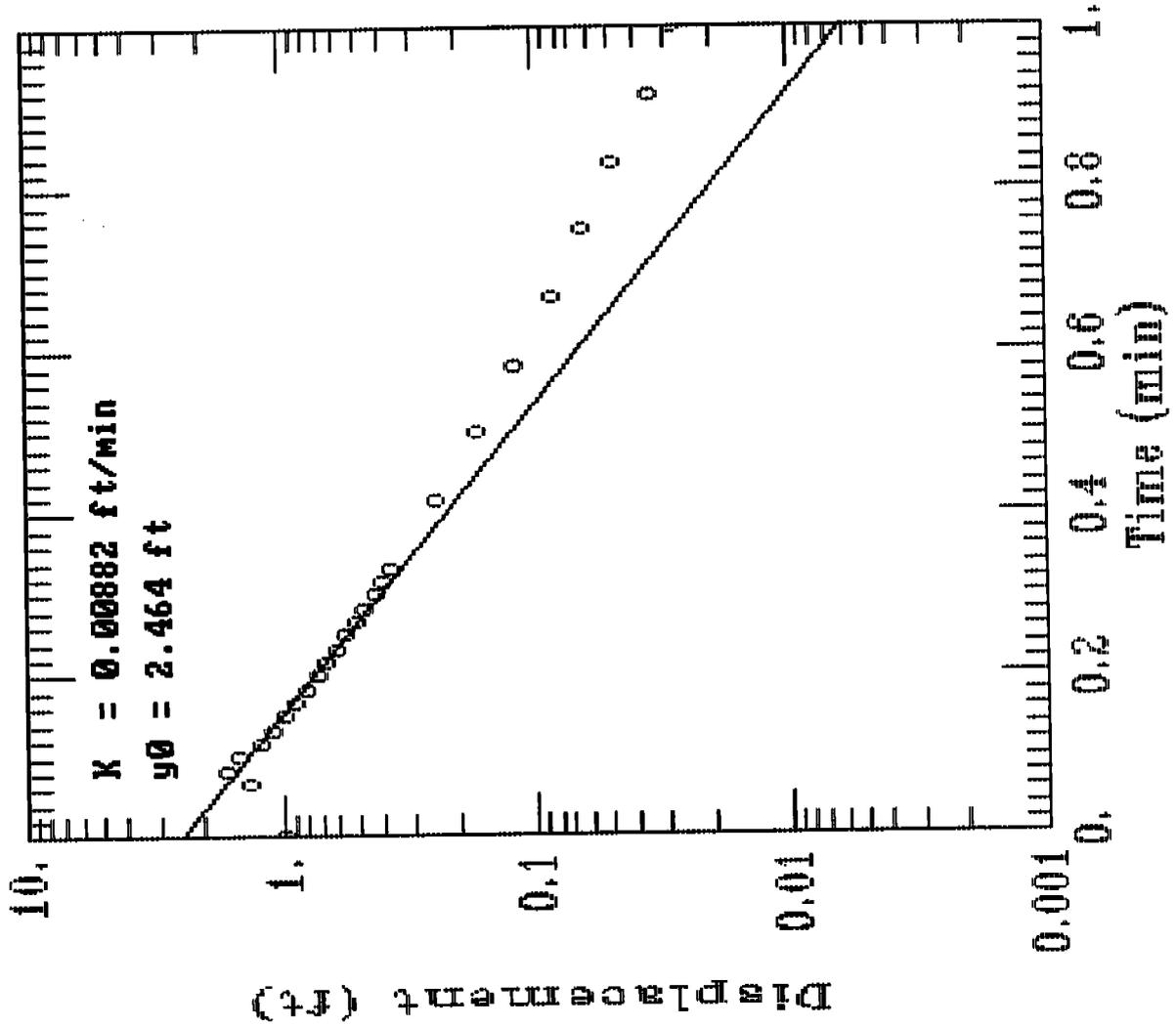
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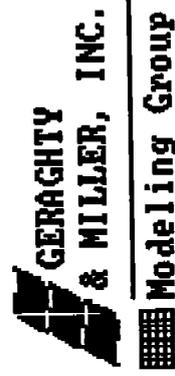
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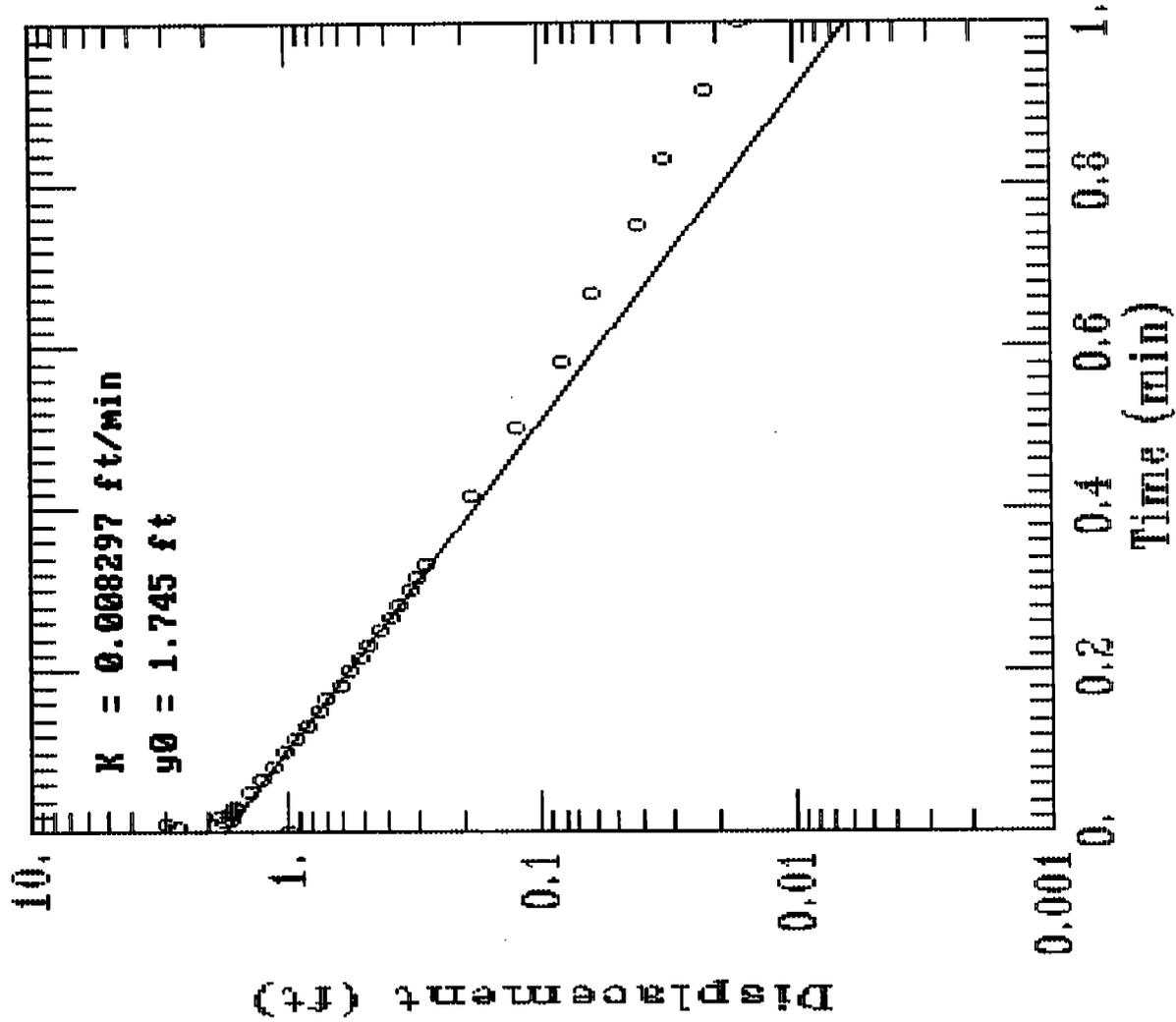
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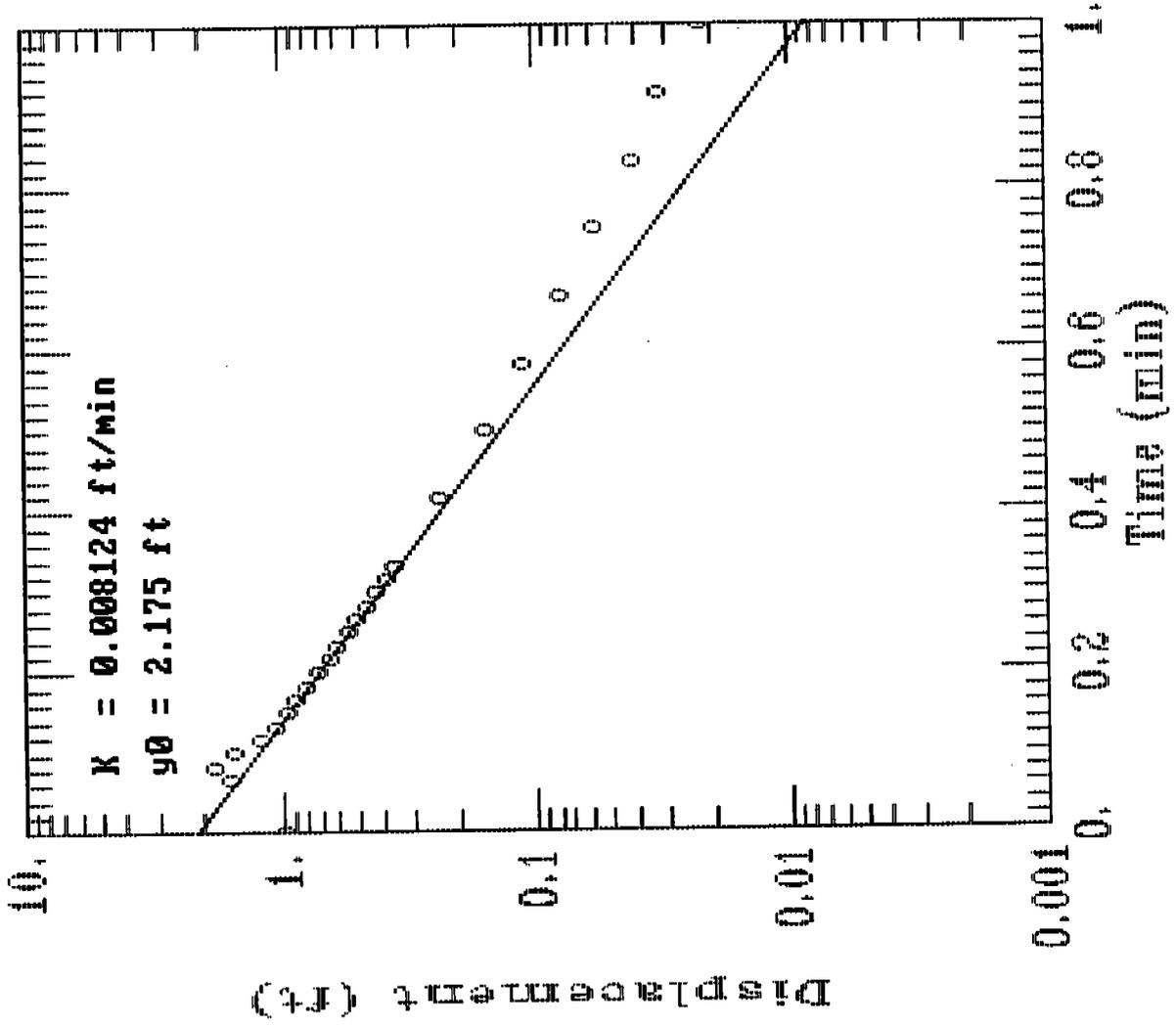
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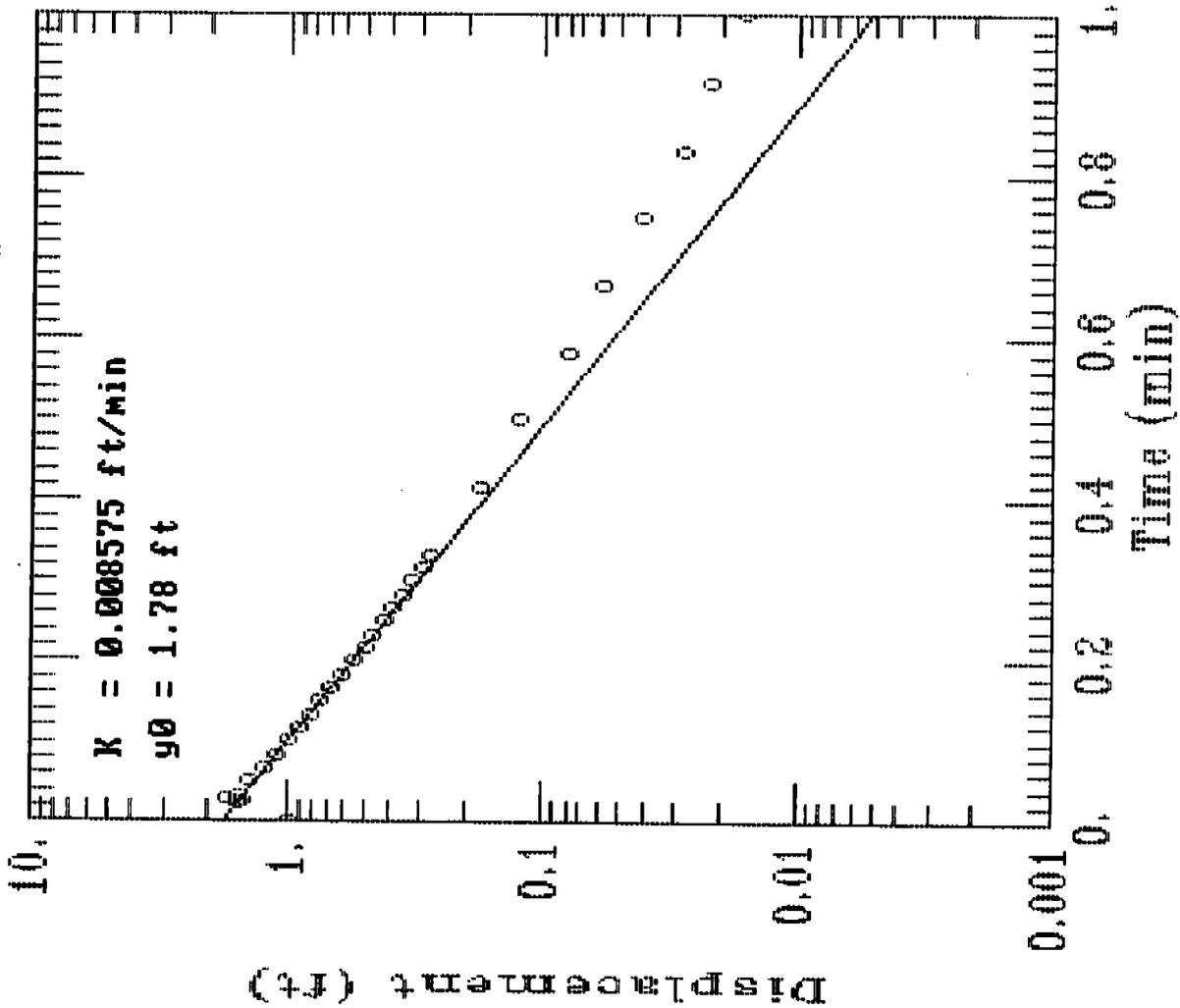


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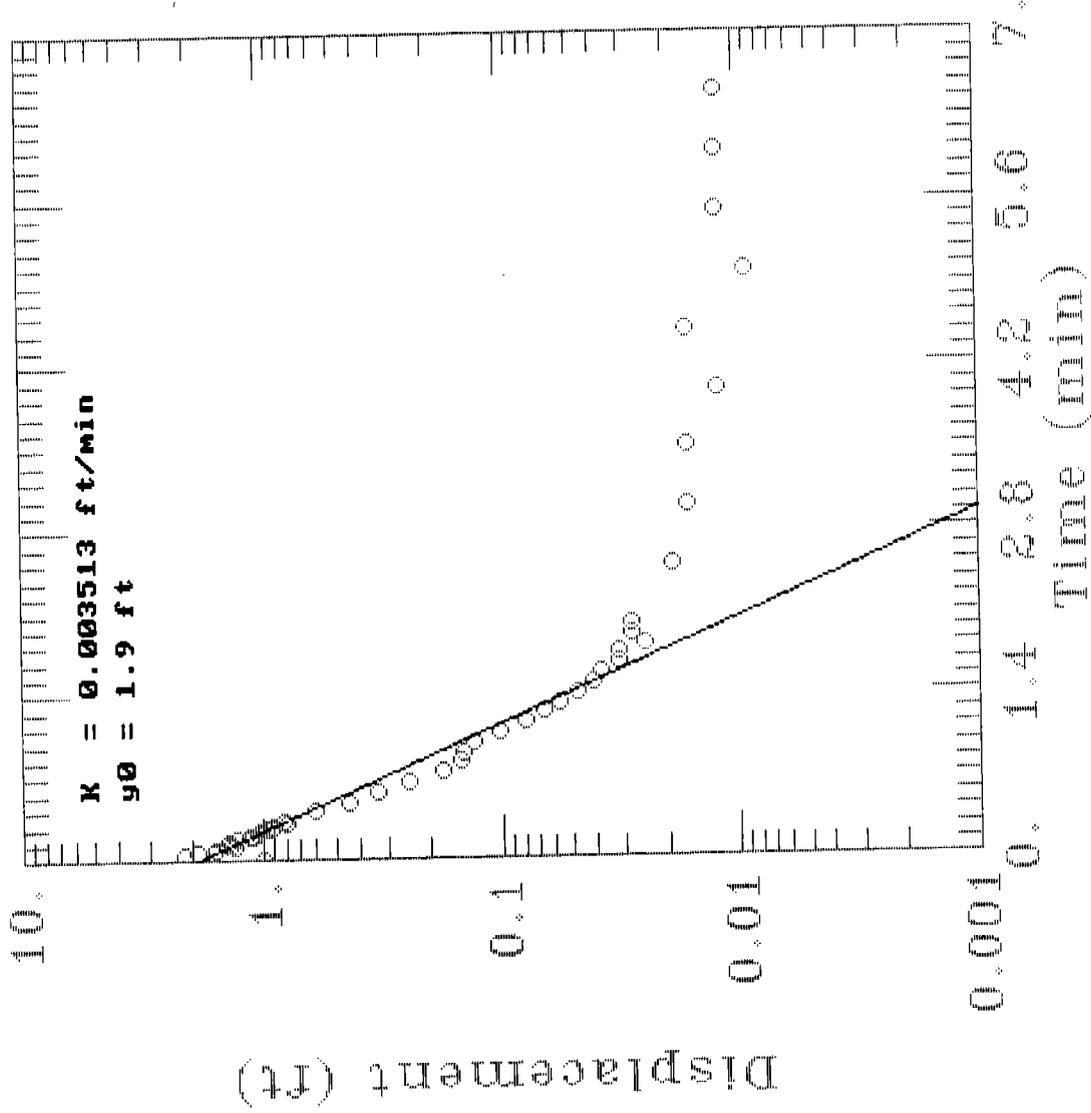


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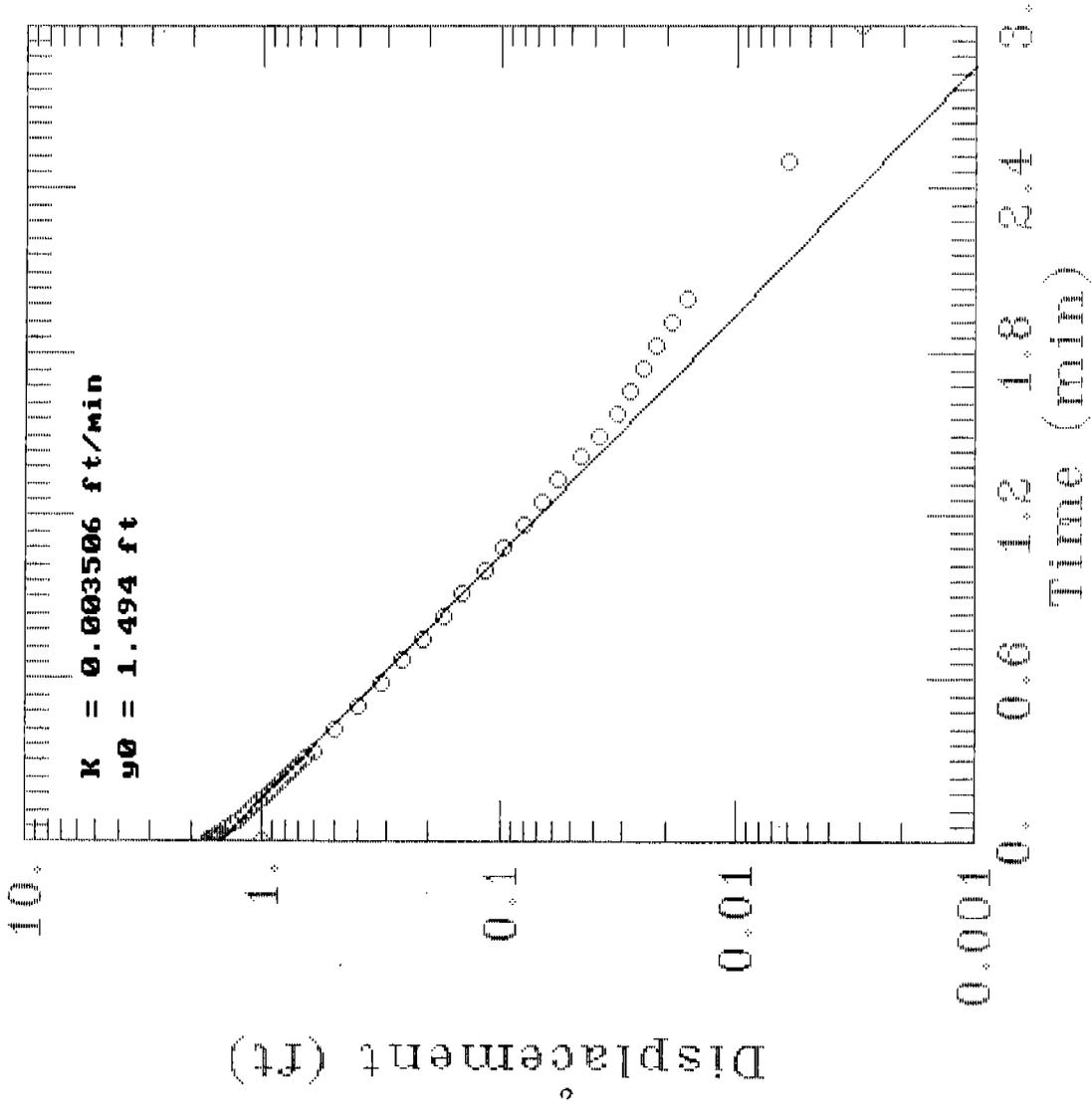
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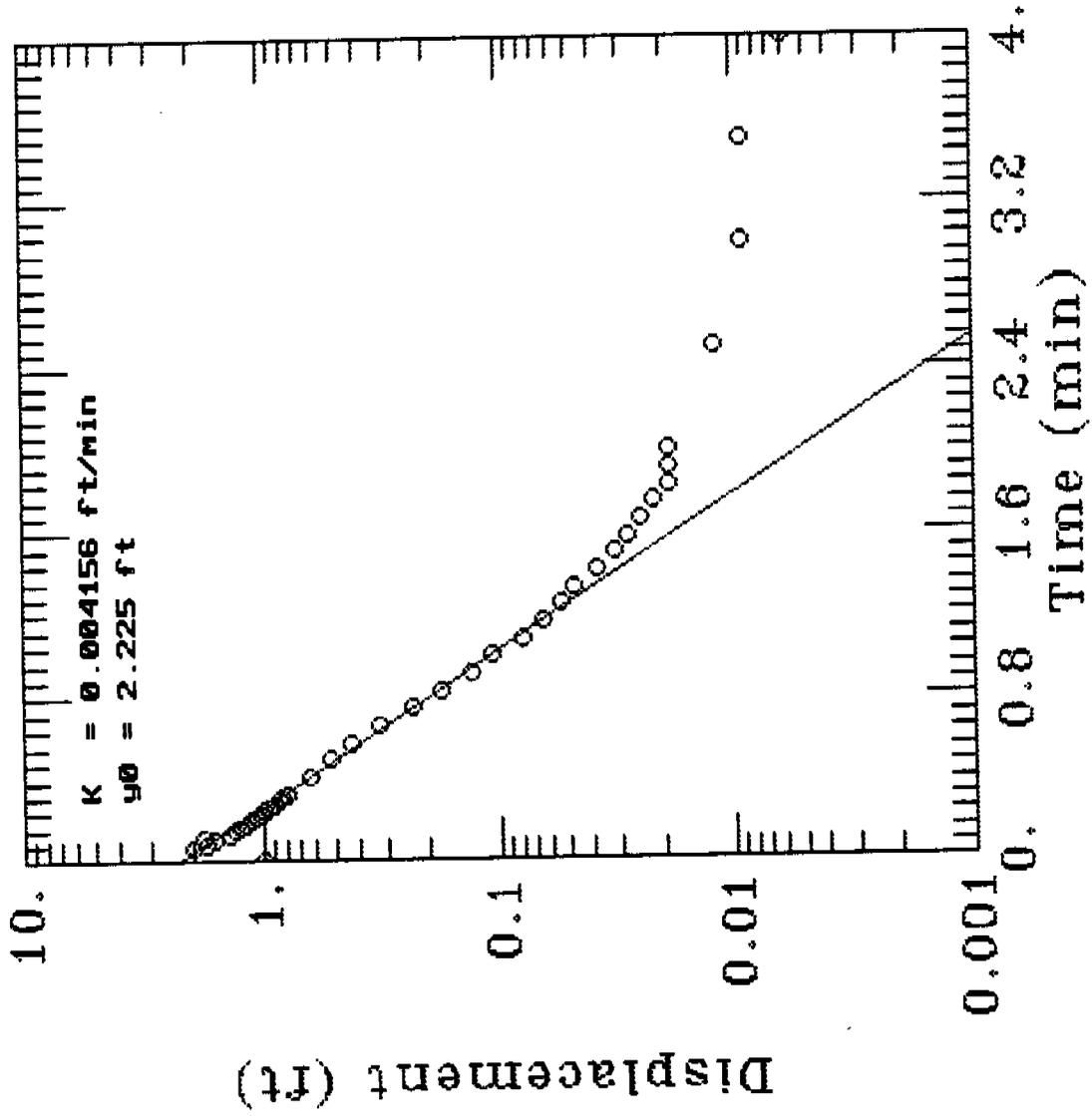
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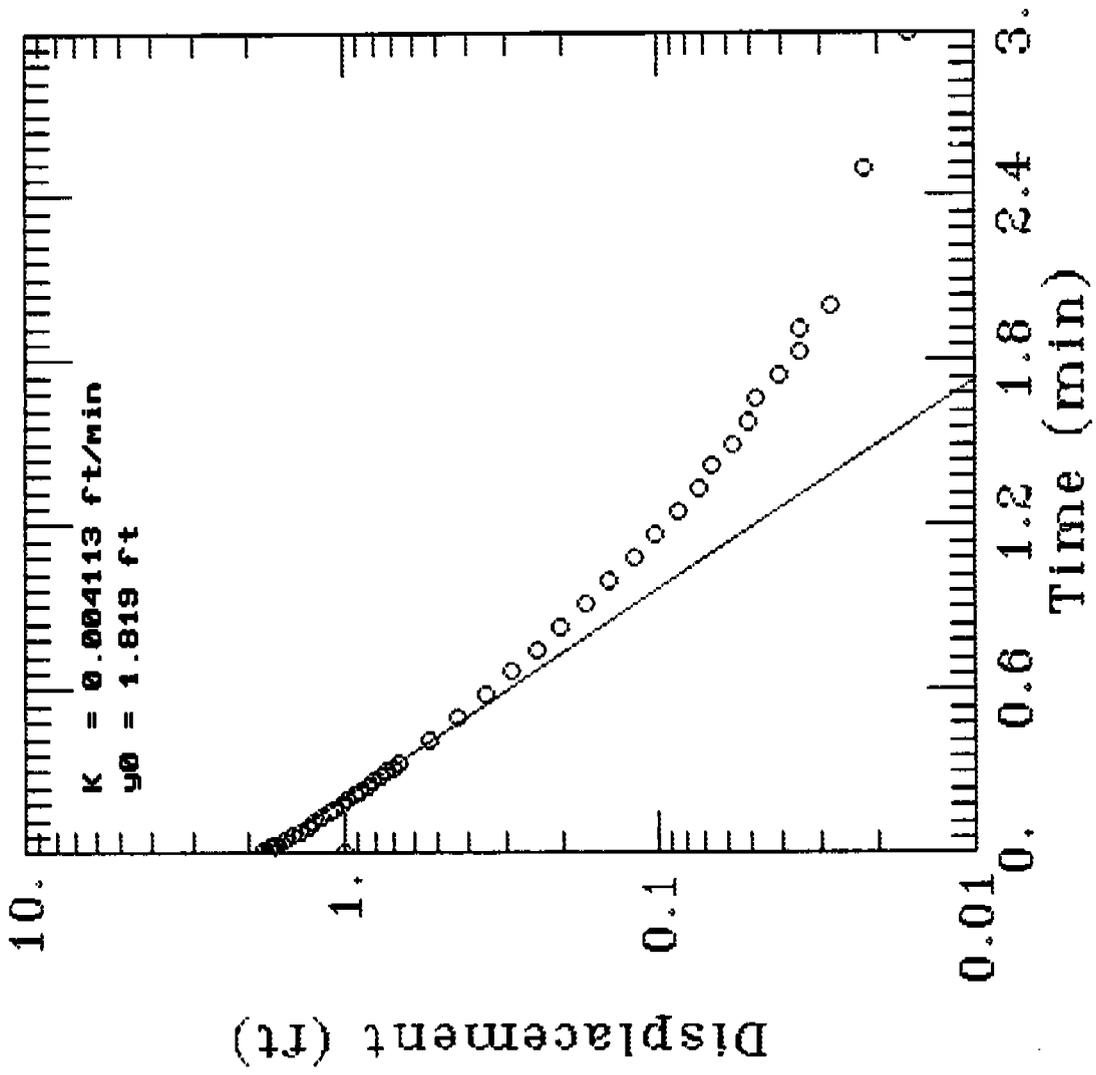
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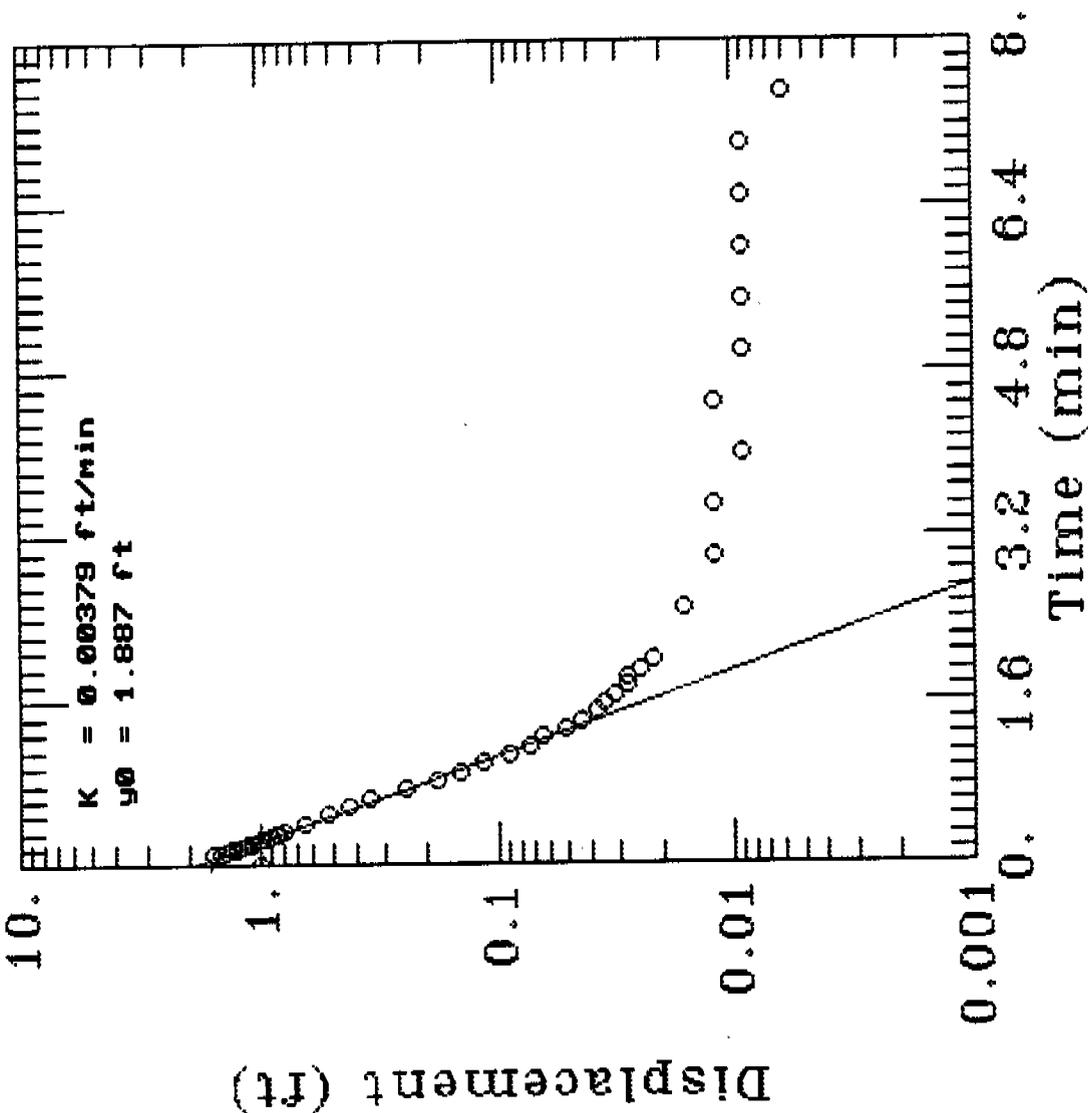
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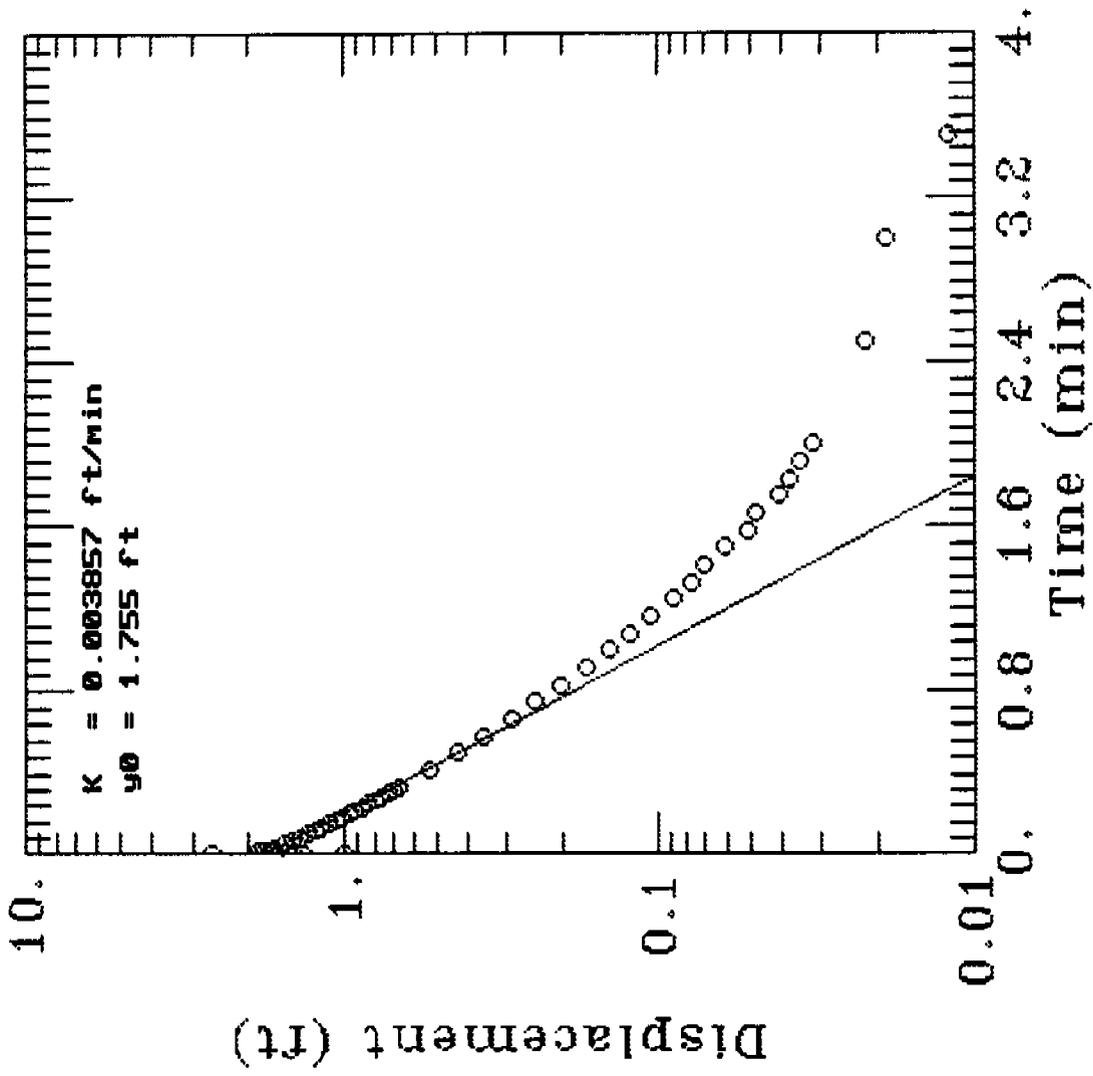
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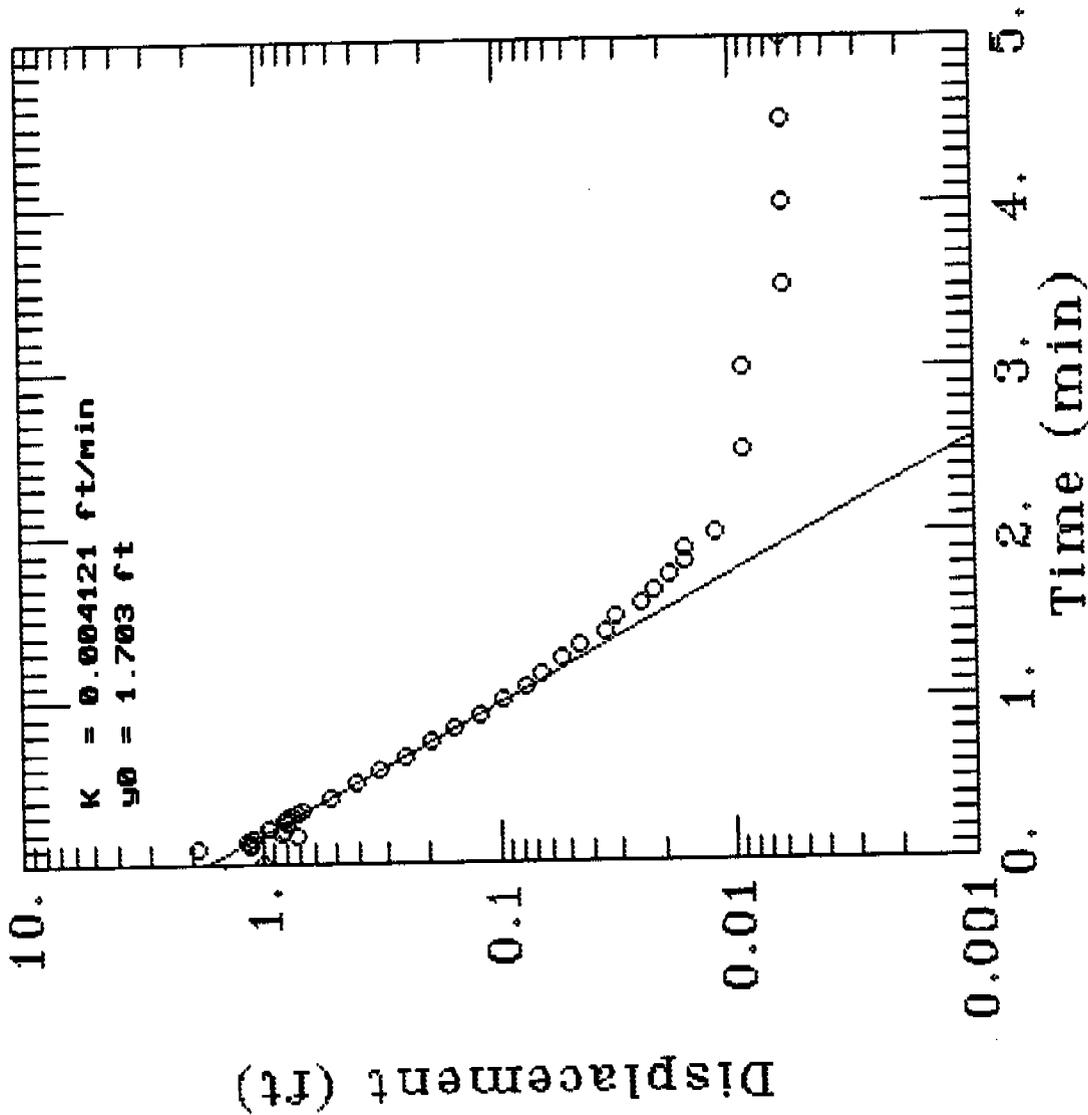
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MAYPORT NAVAL STATION MPT-2-P5-S5



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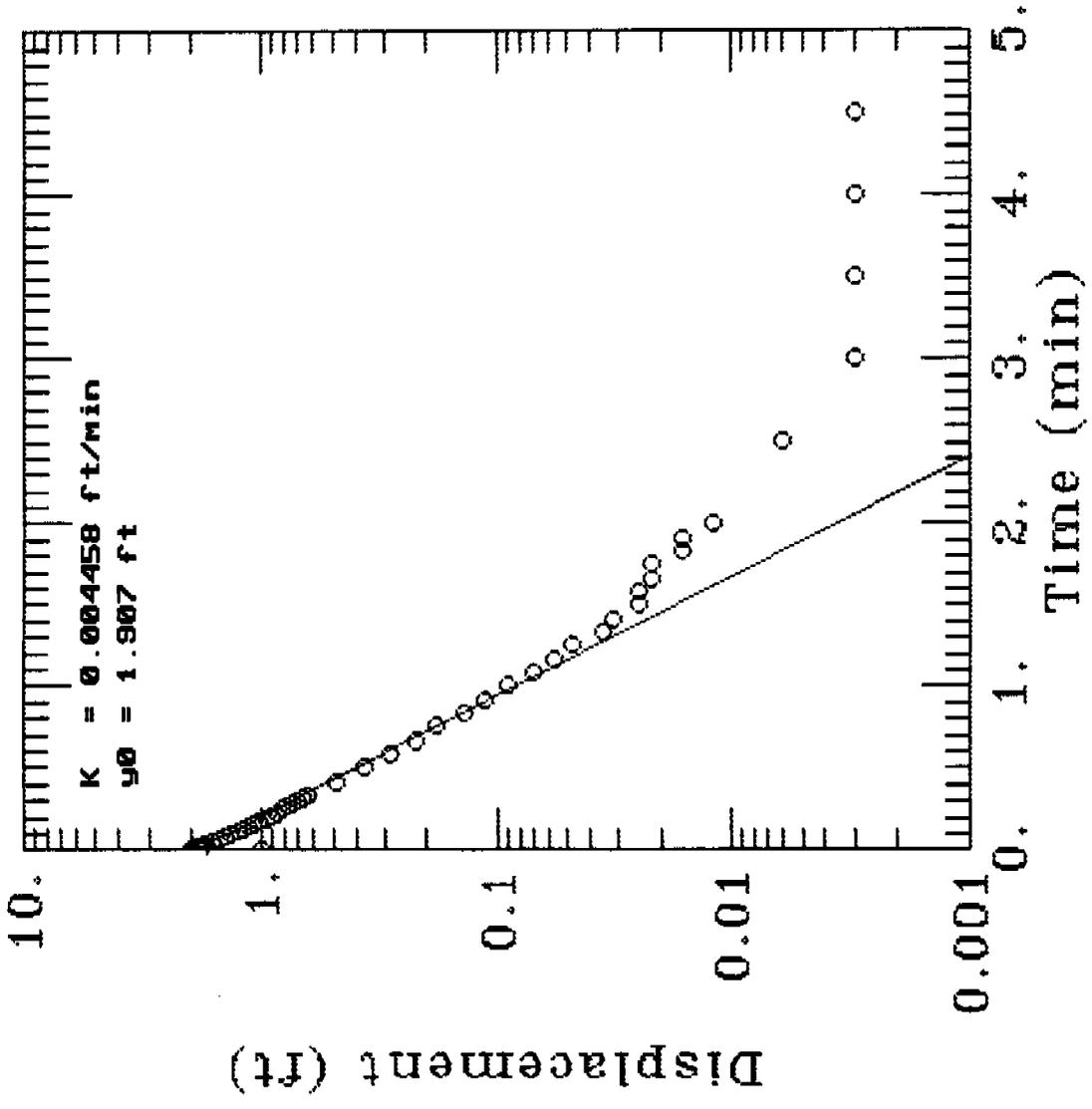


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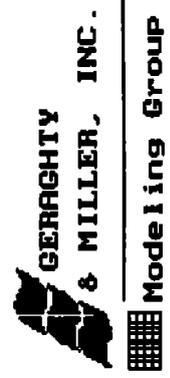


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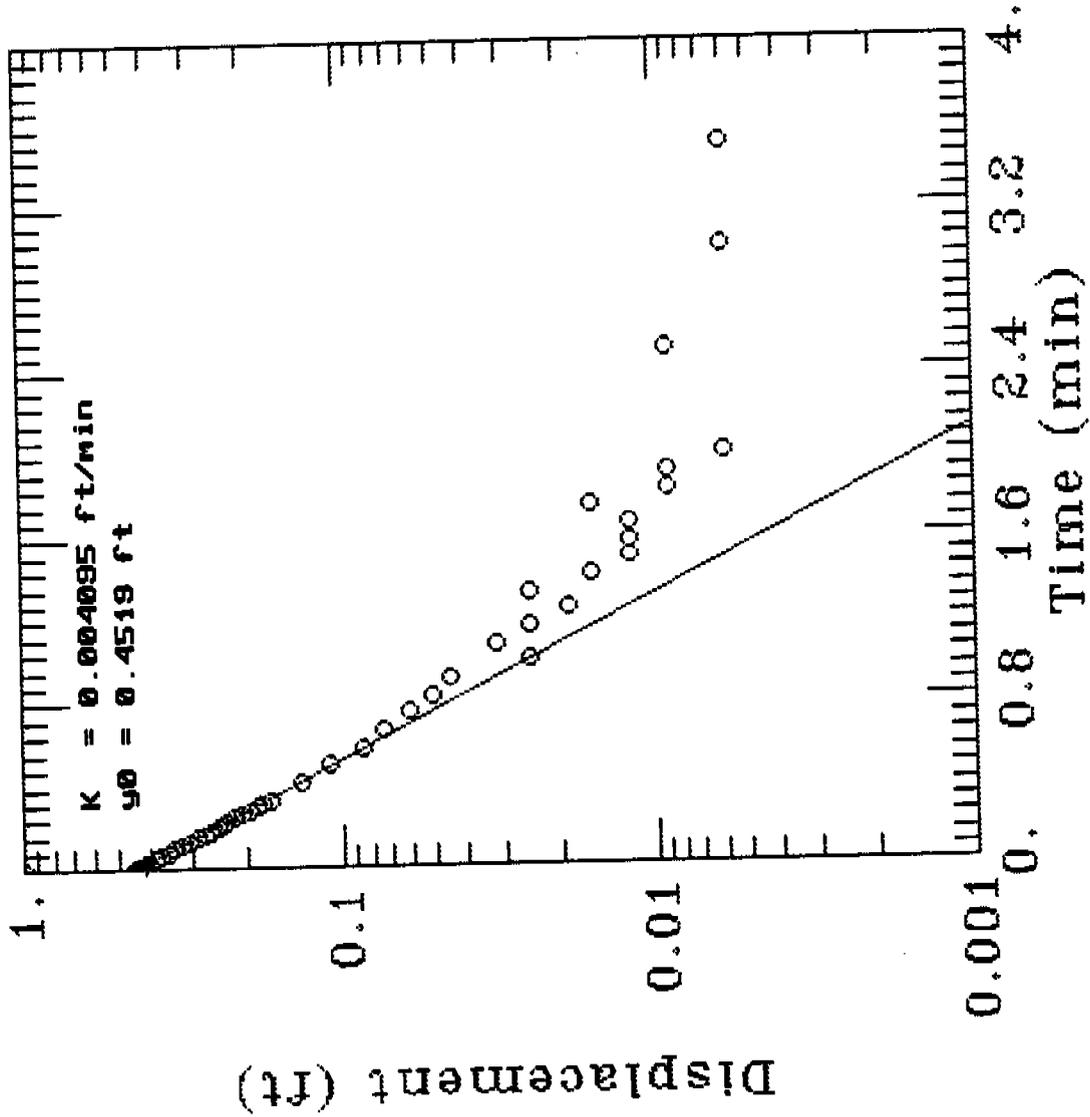
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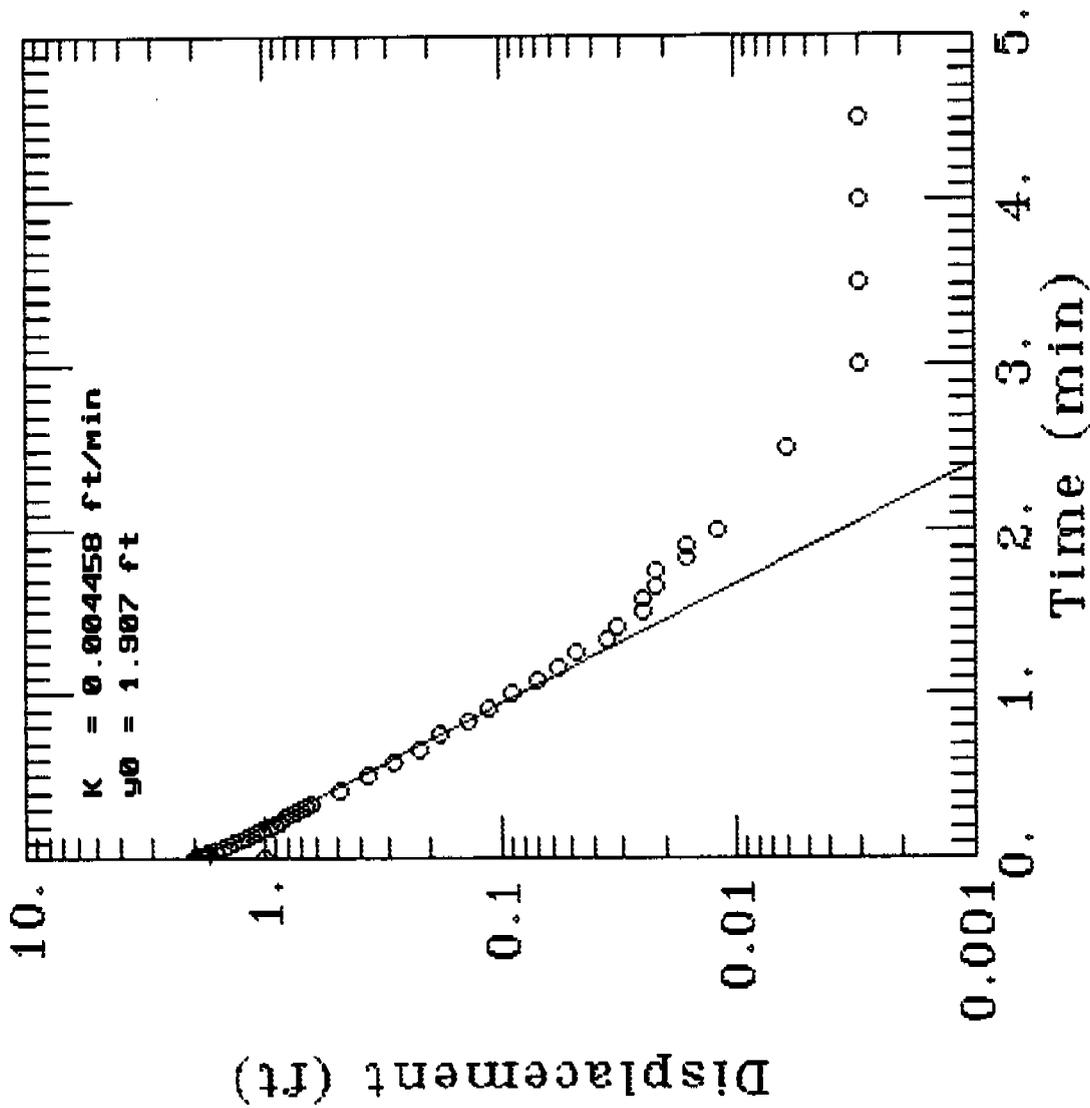


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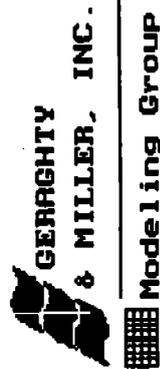


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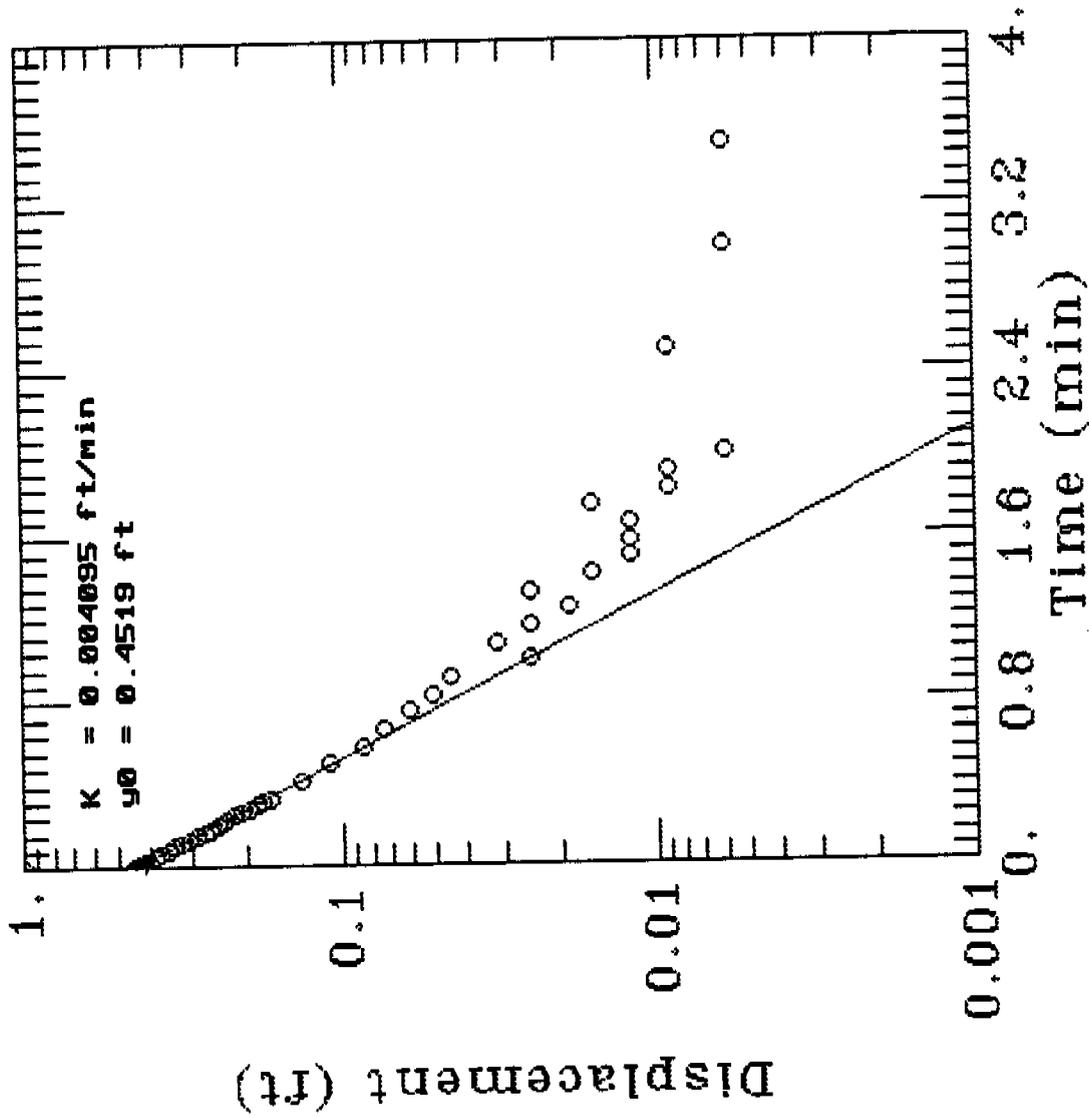
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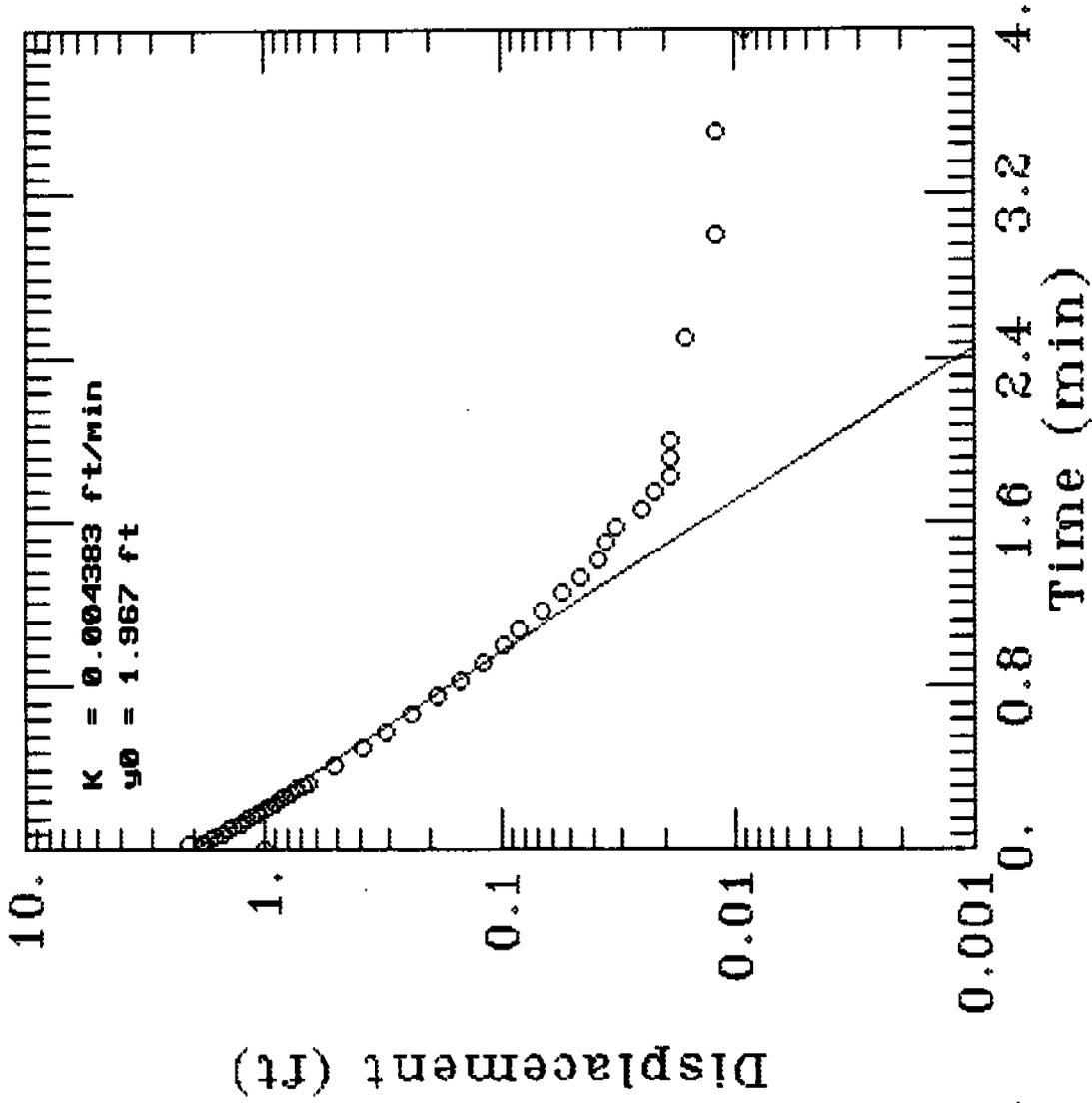


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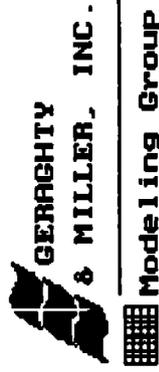


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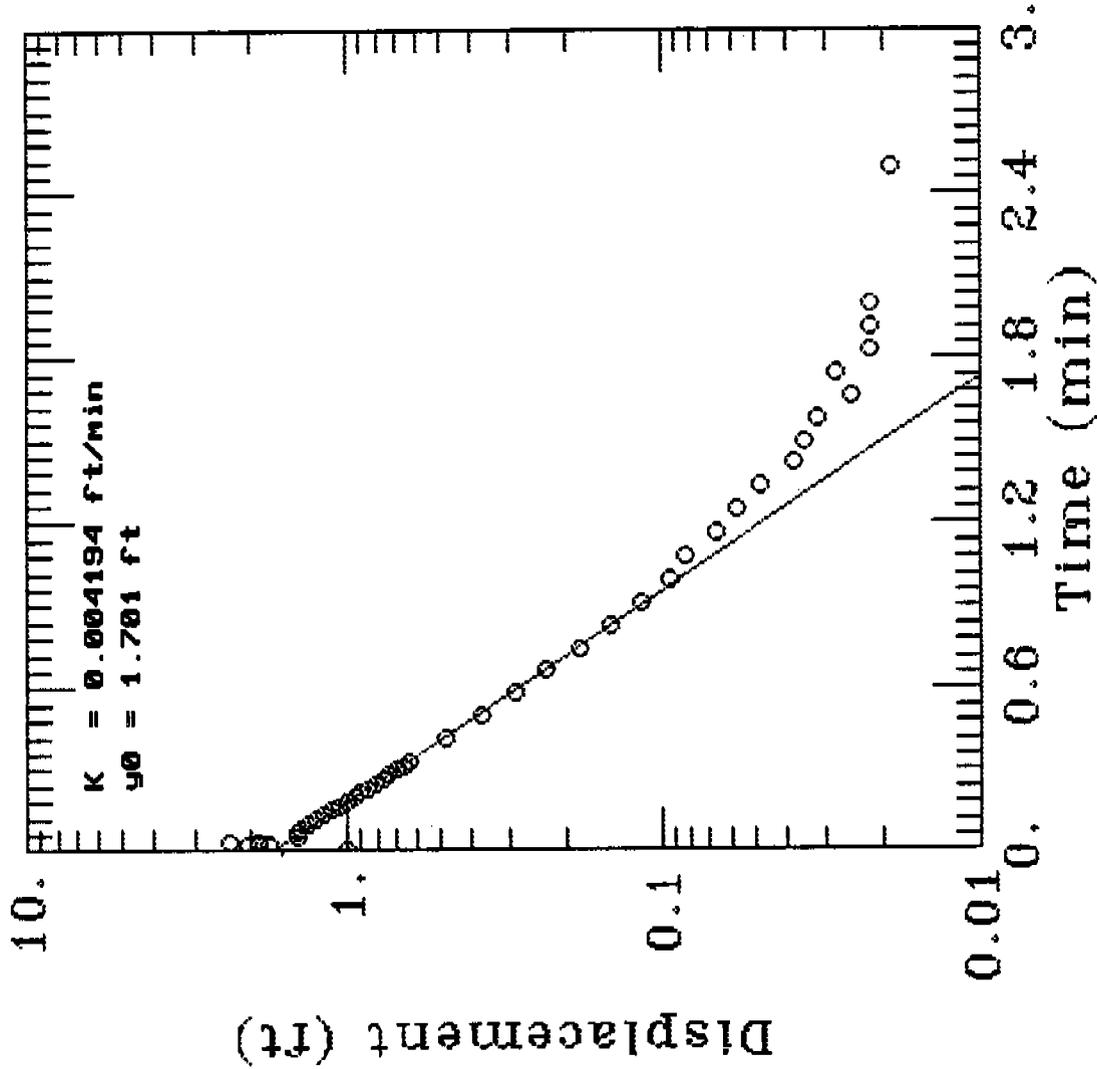
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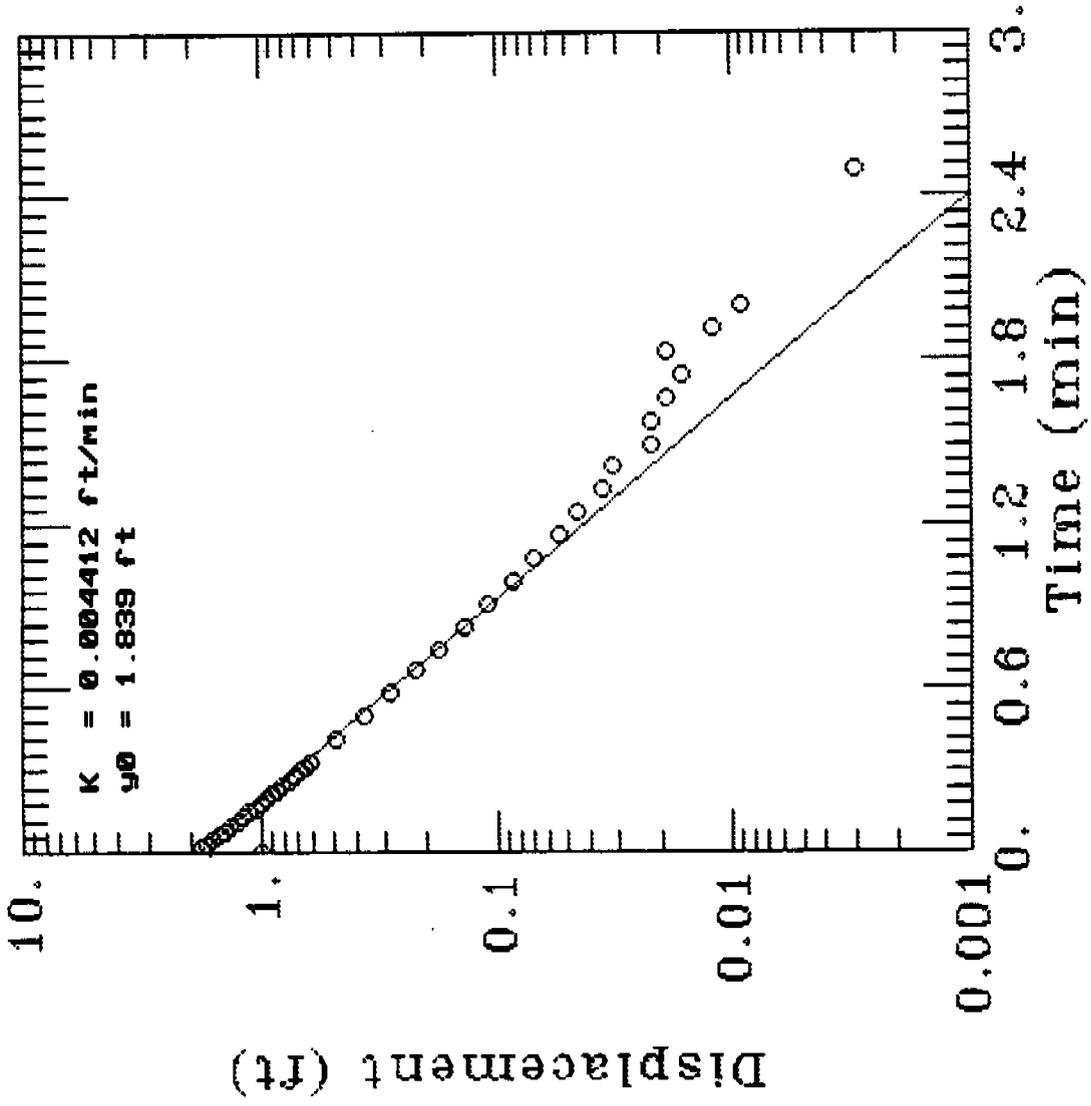


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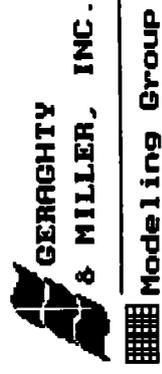


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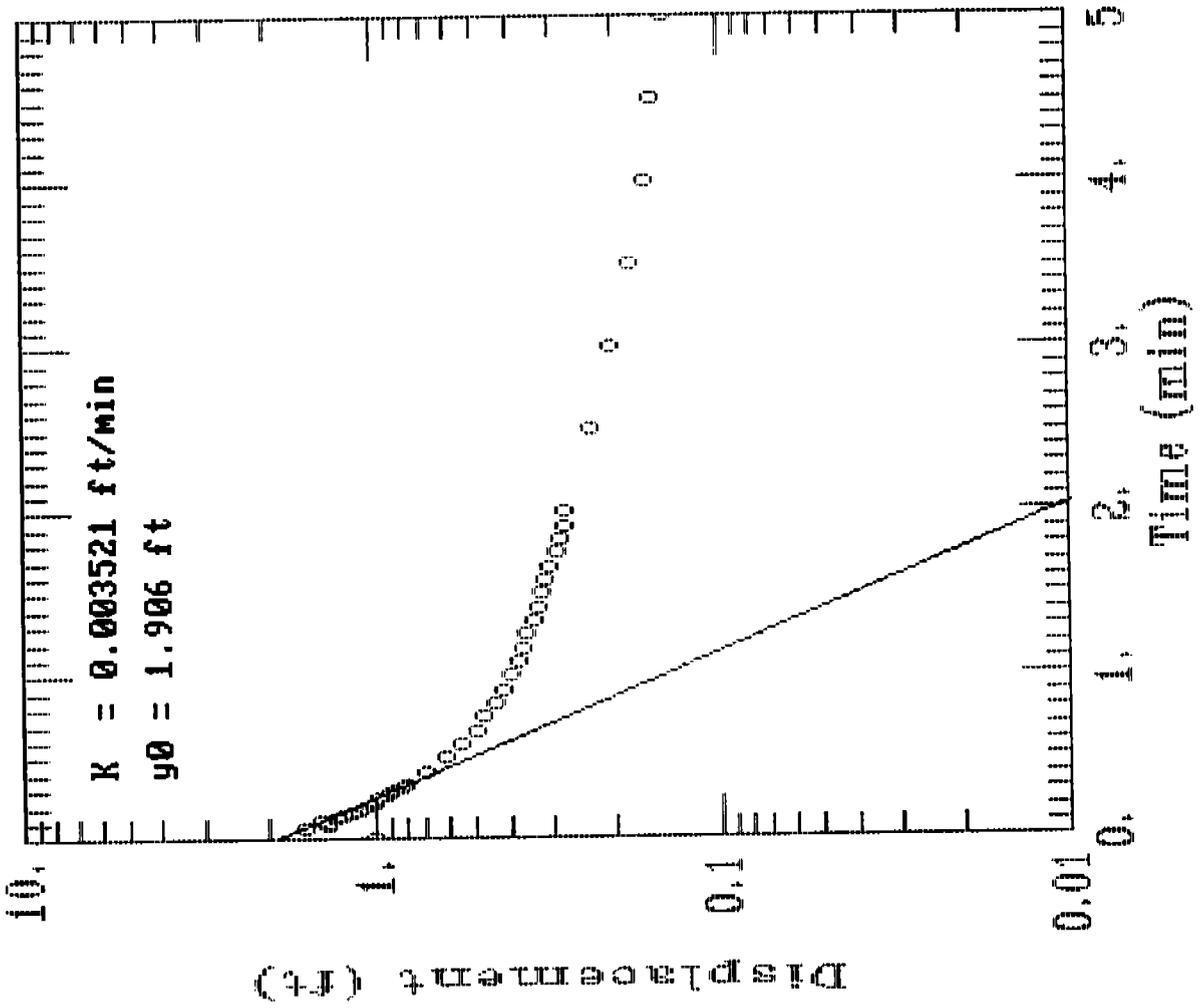
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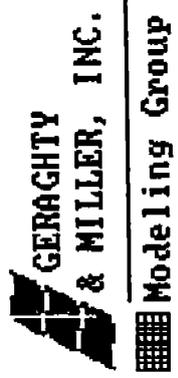
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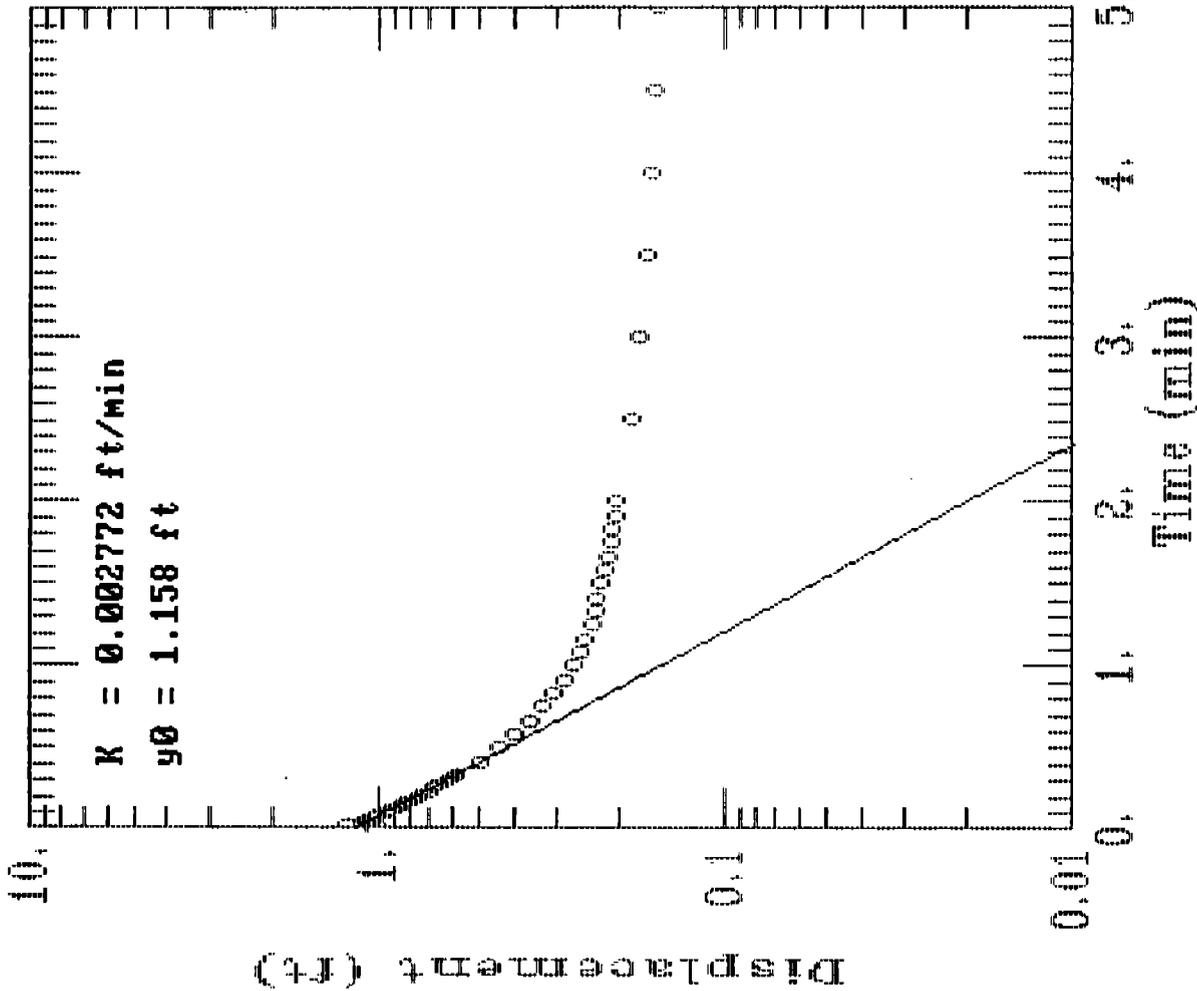
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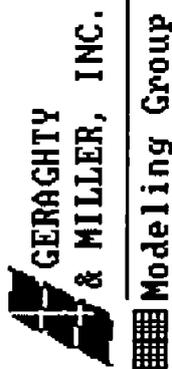
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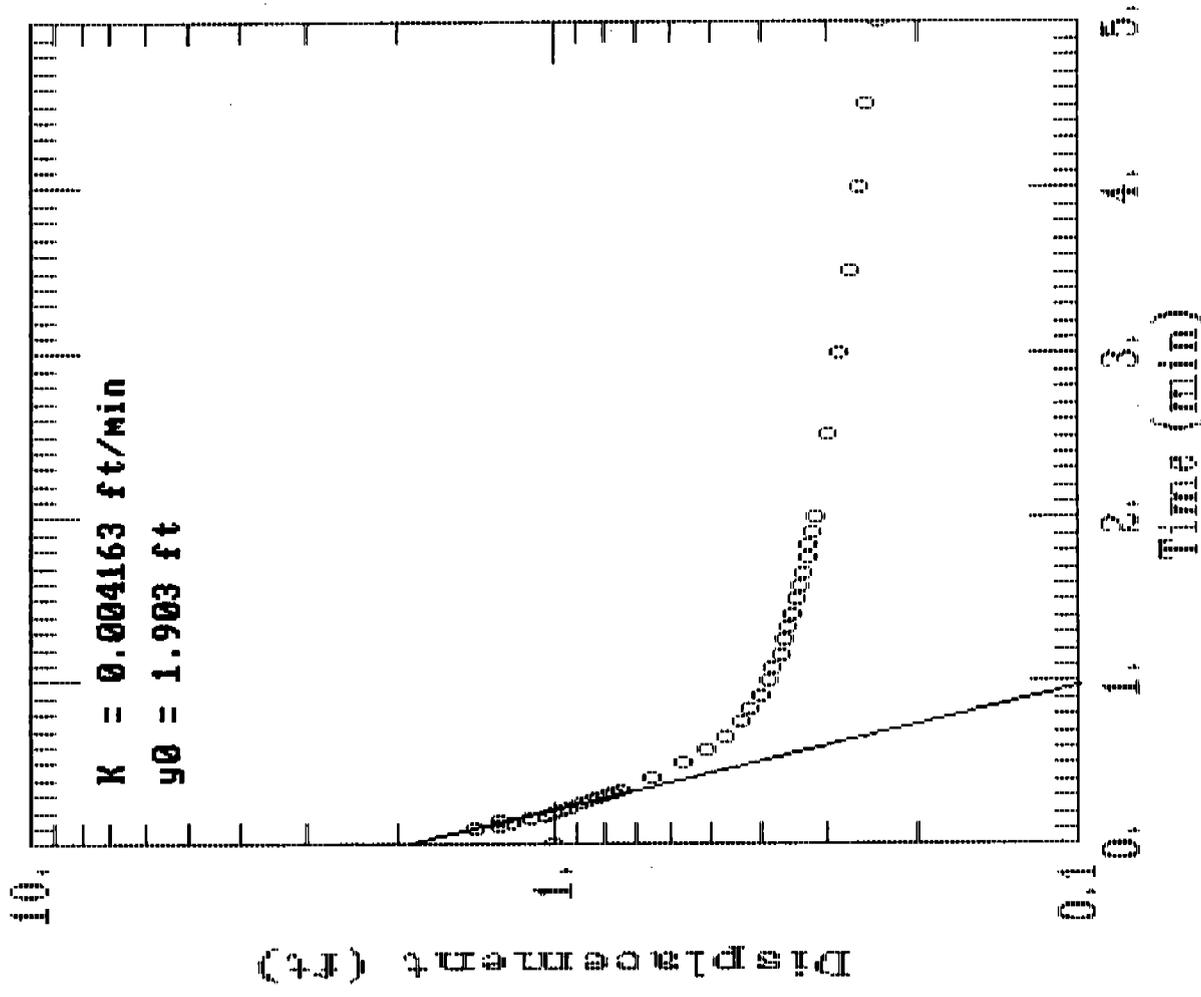
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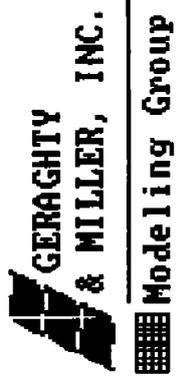
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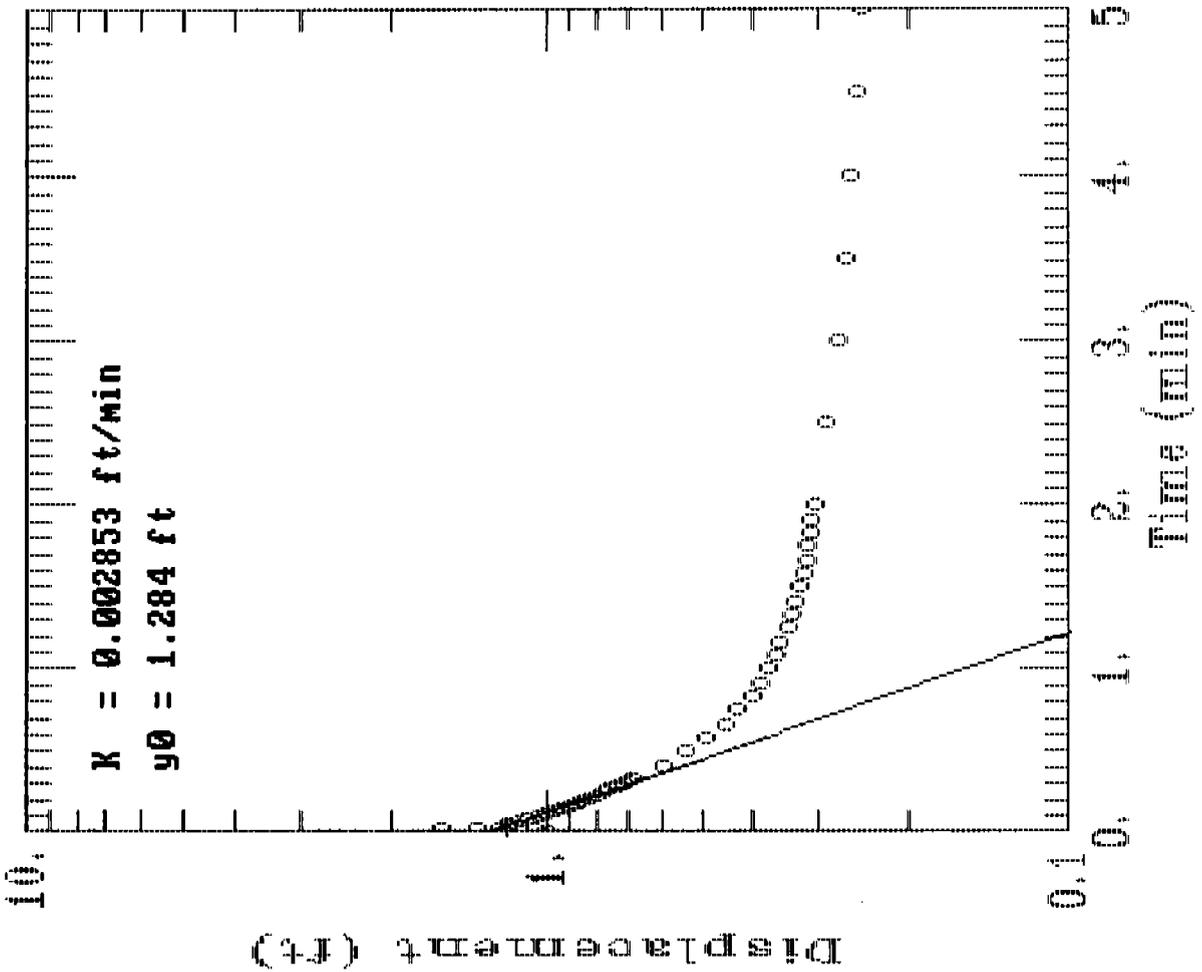
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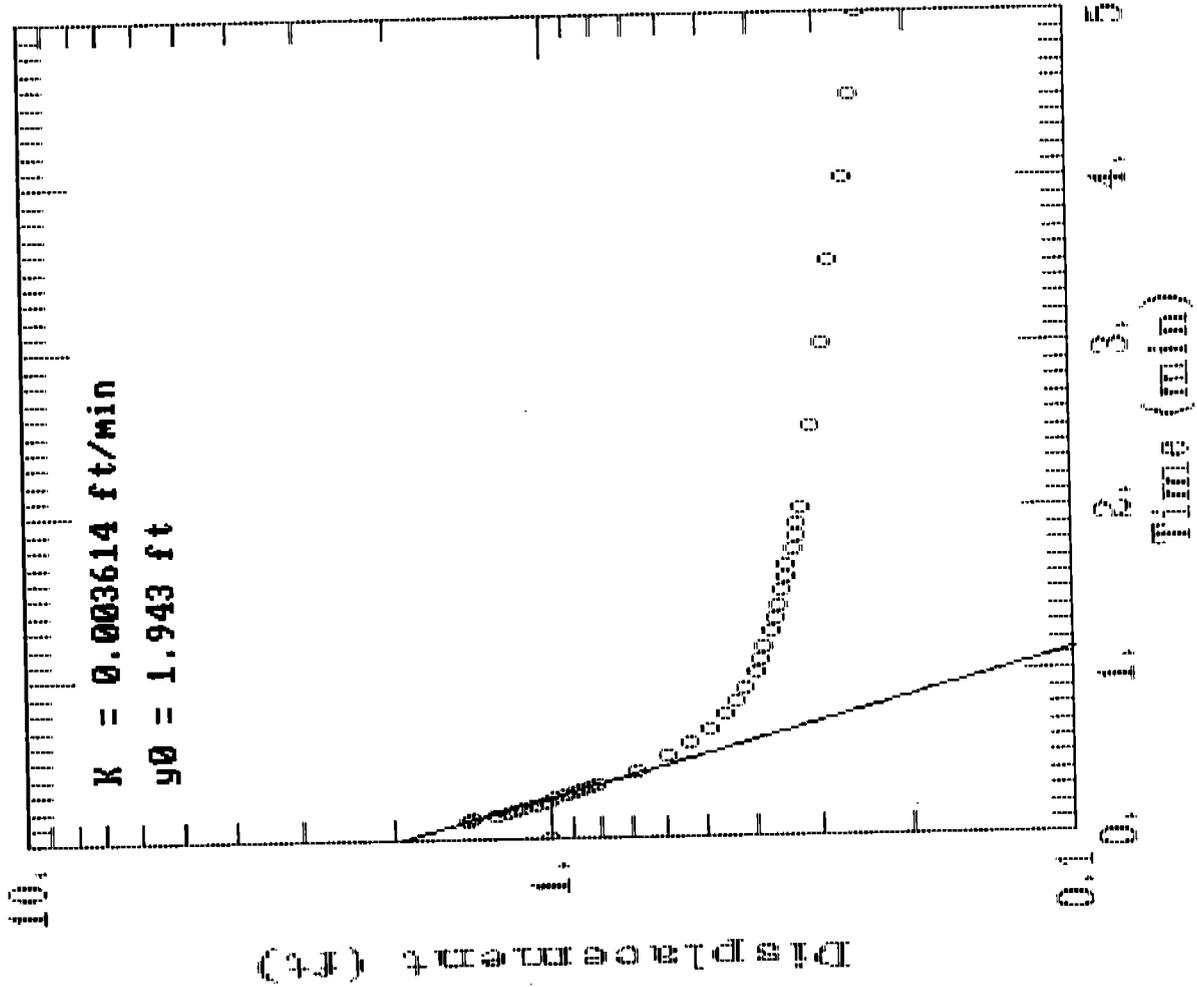


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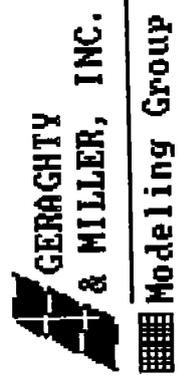


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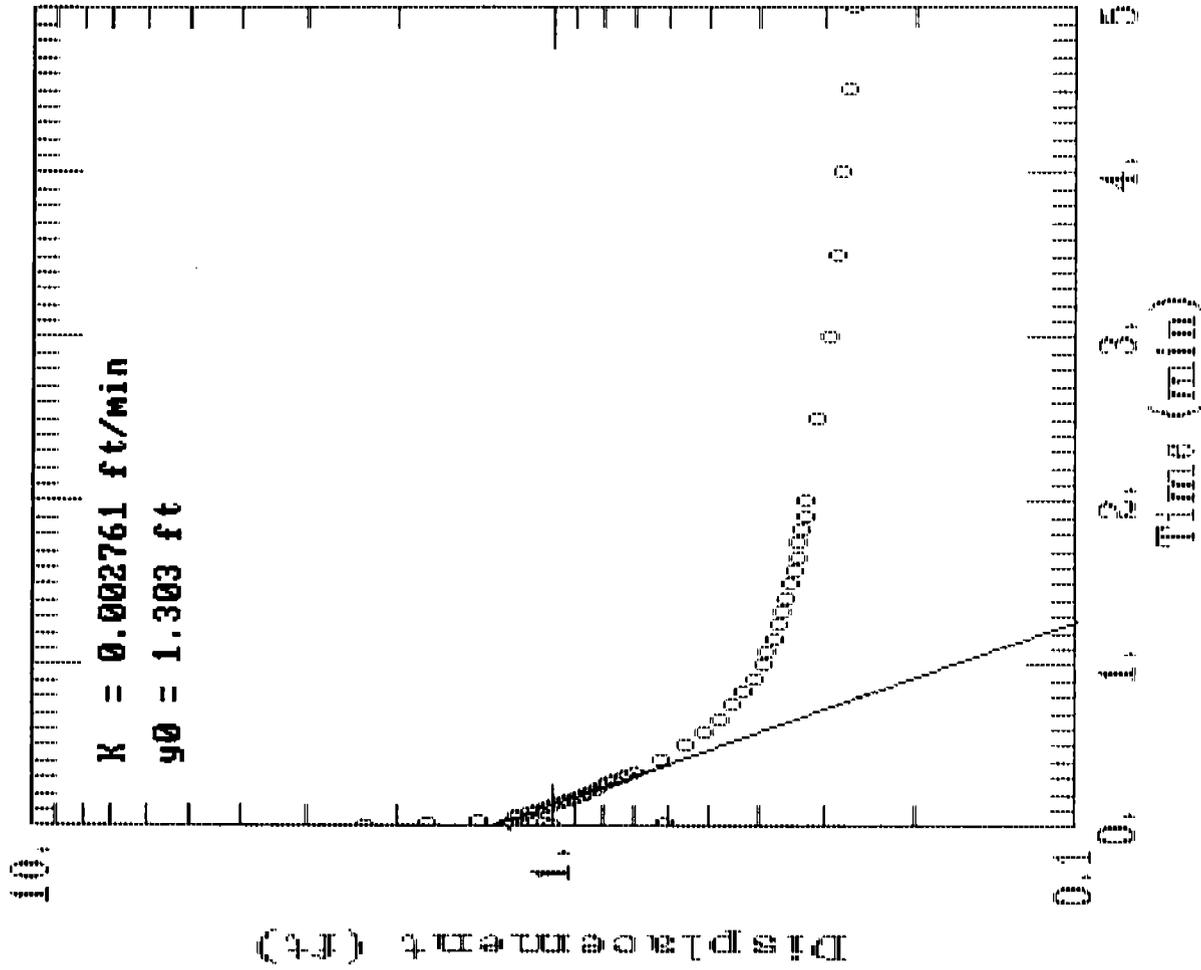
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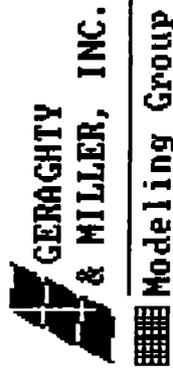
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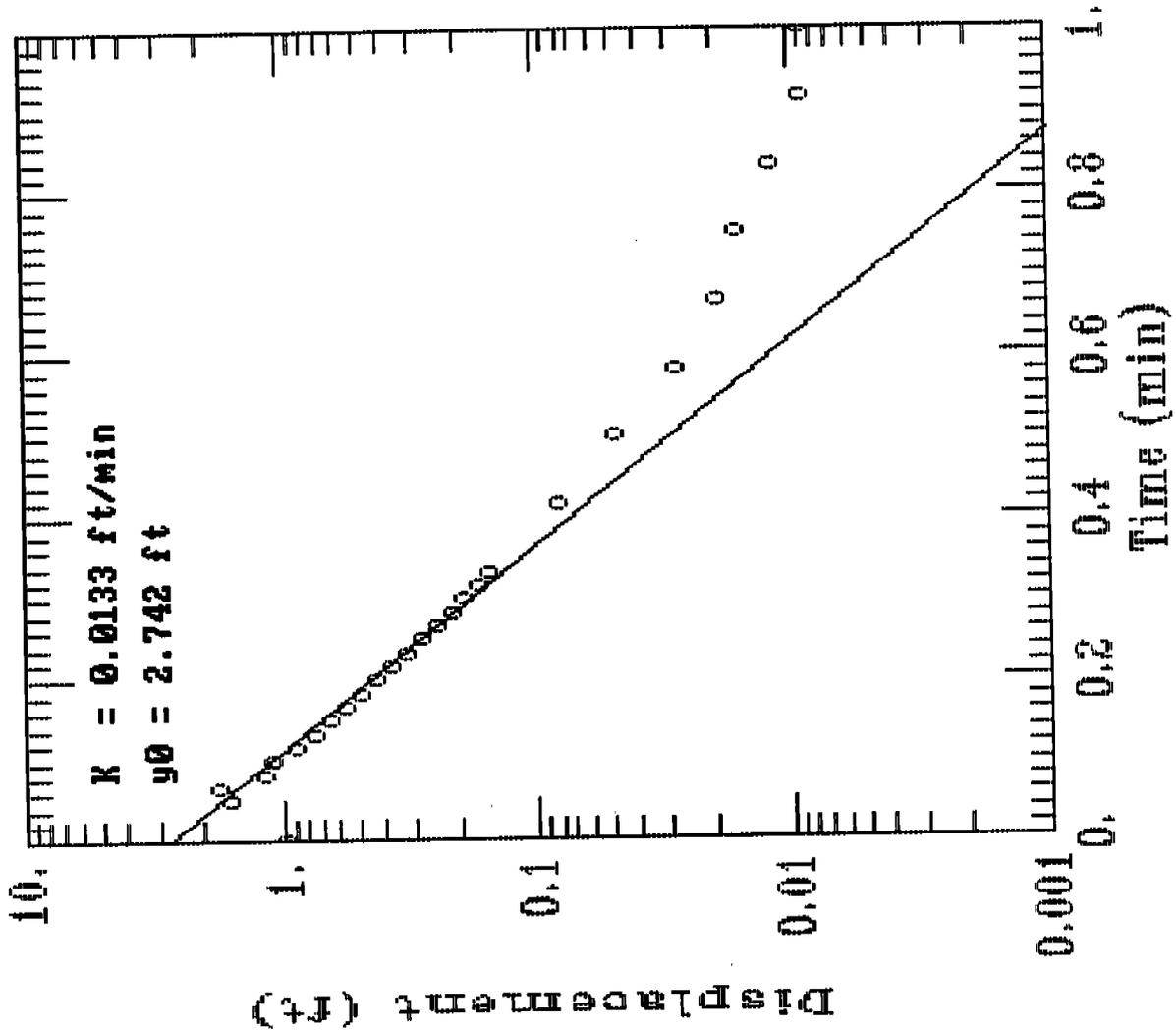
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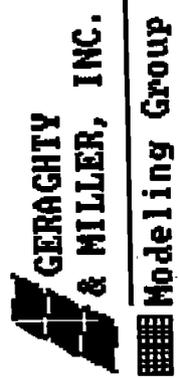
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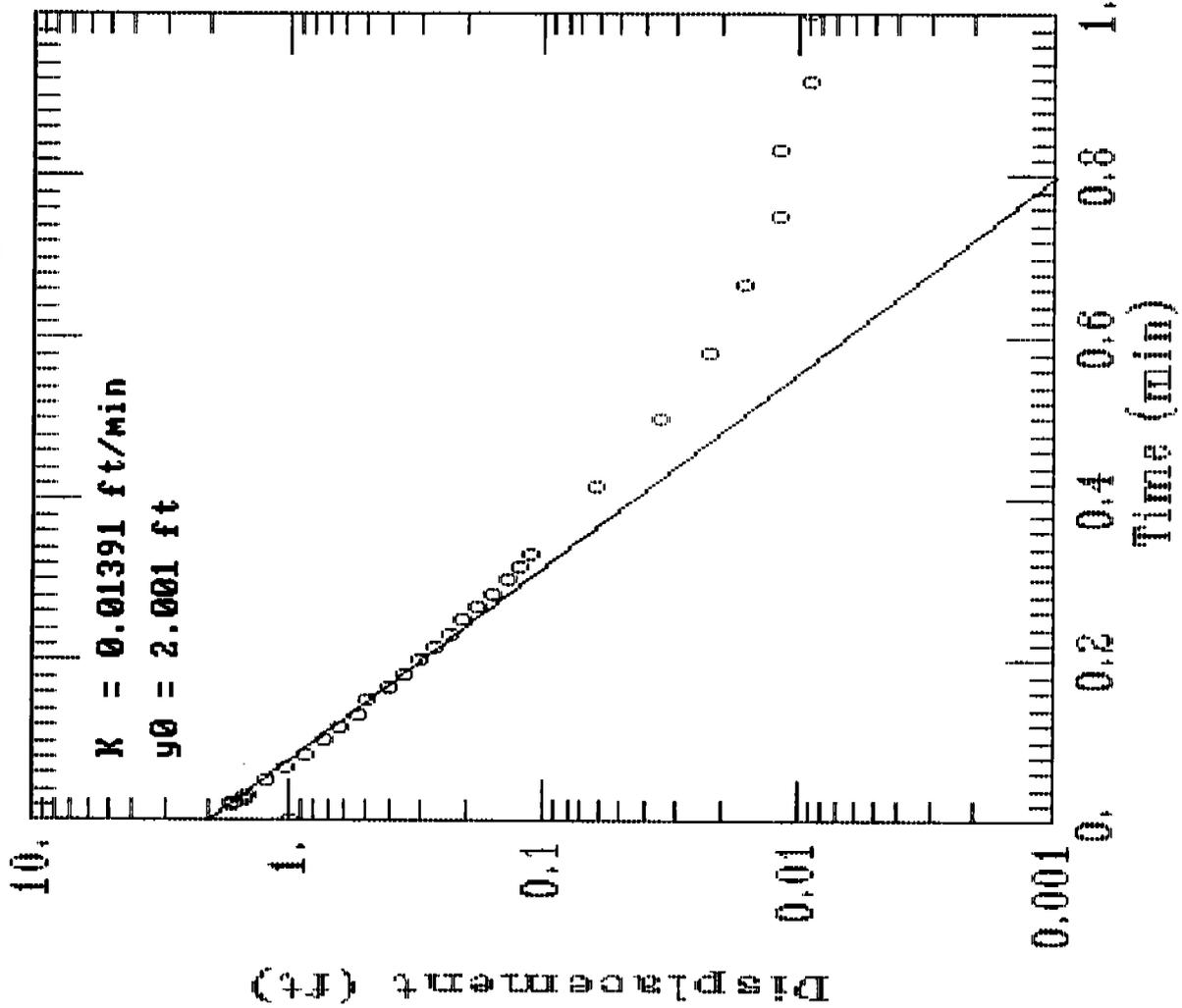
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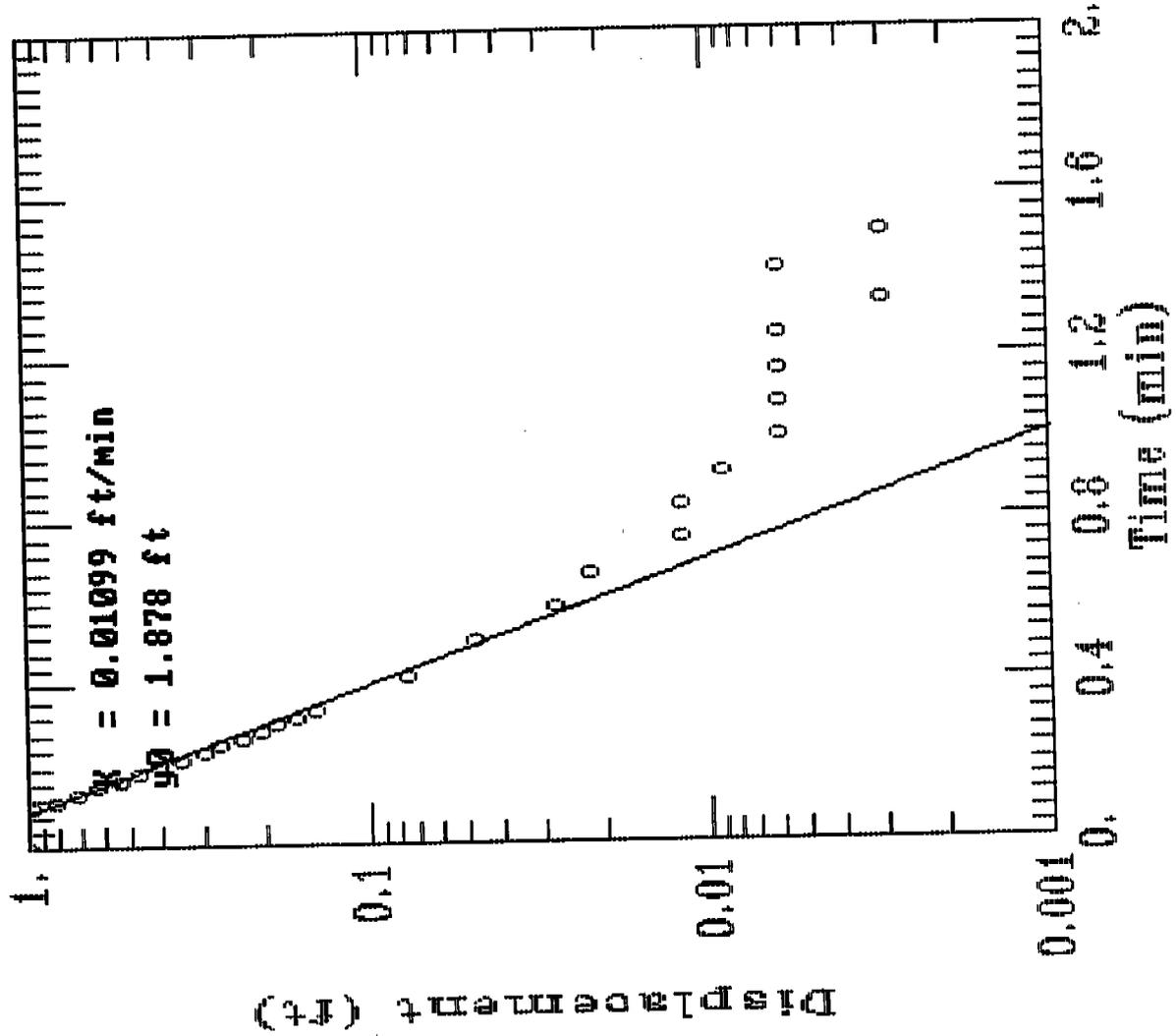
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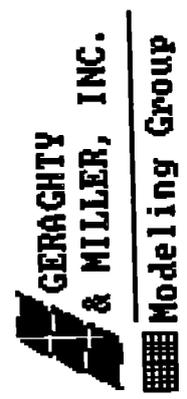
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MPT-2-P-0 RUN #3



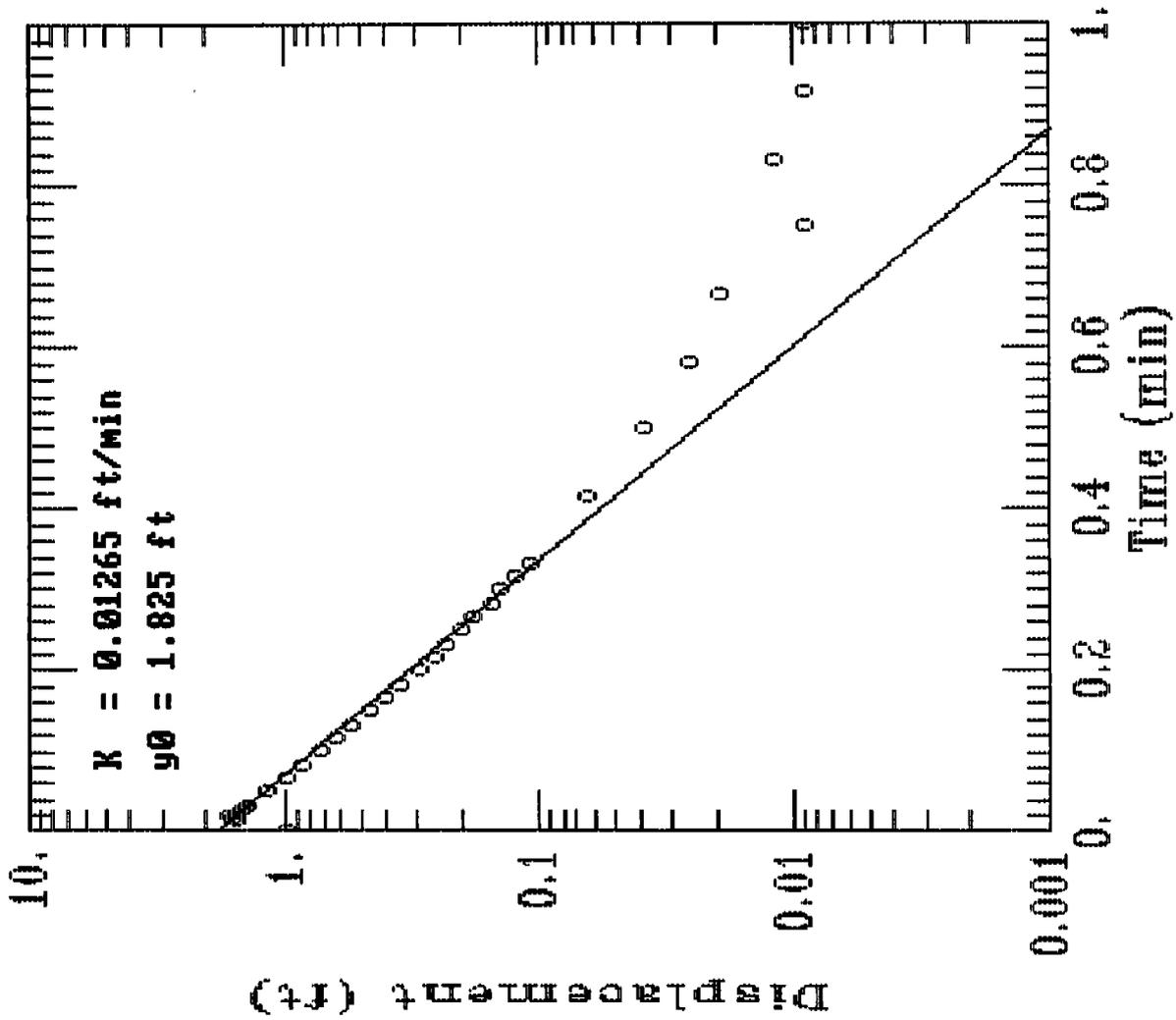
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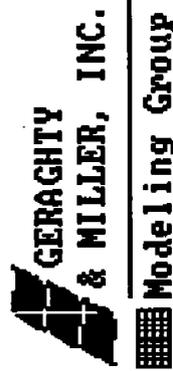
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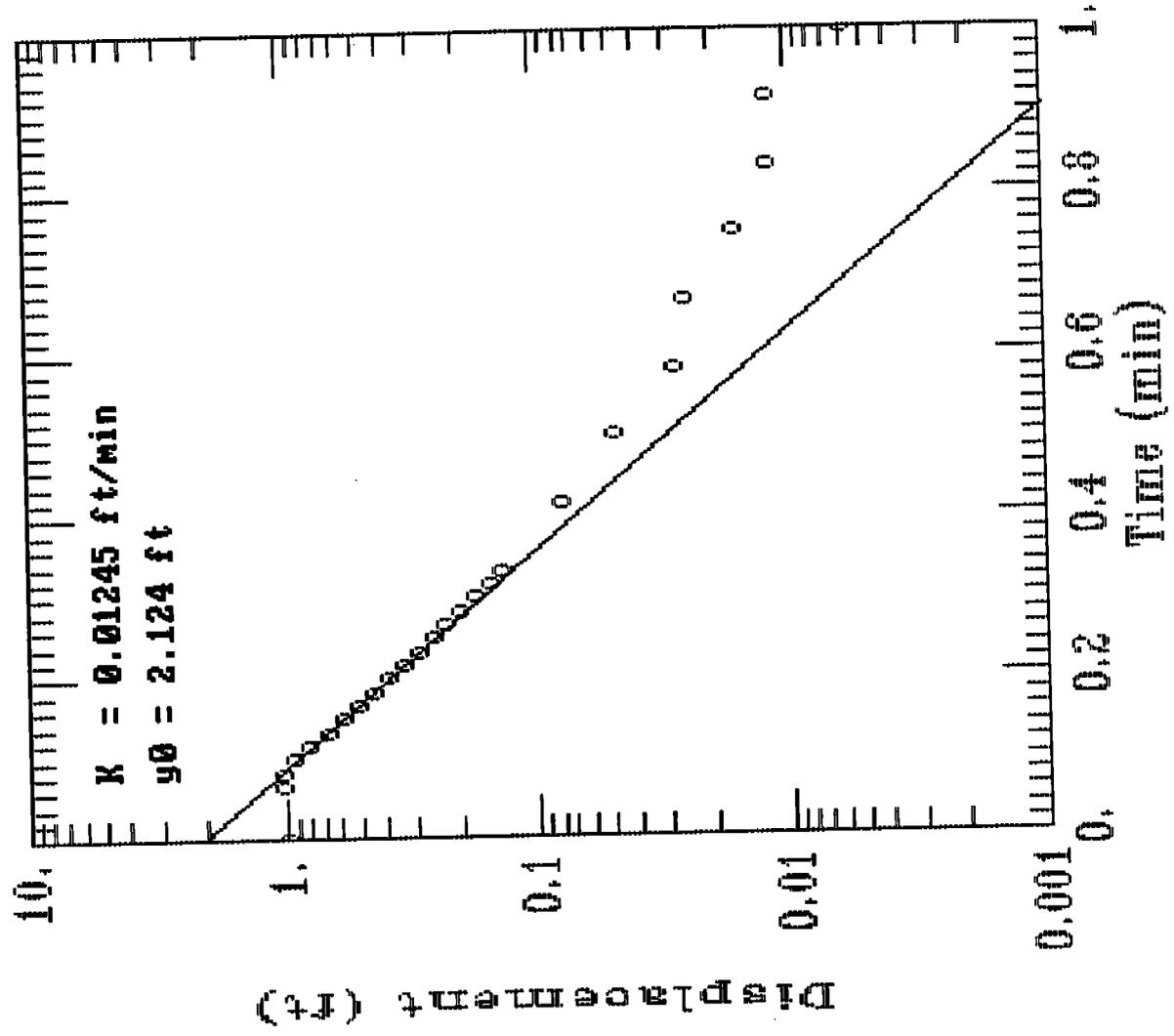
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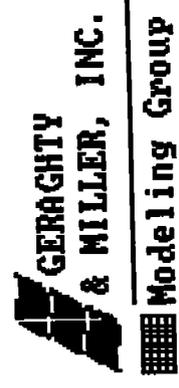
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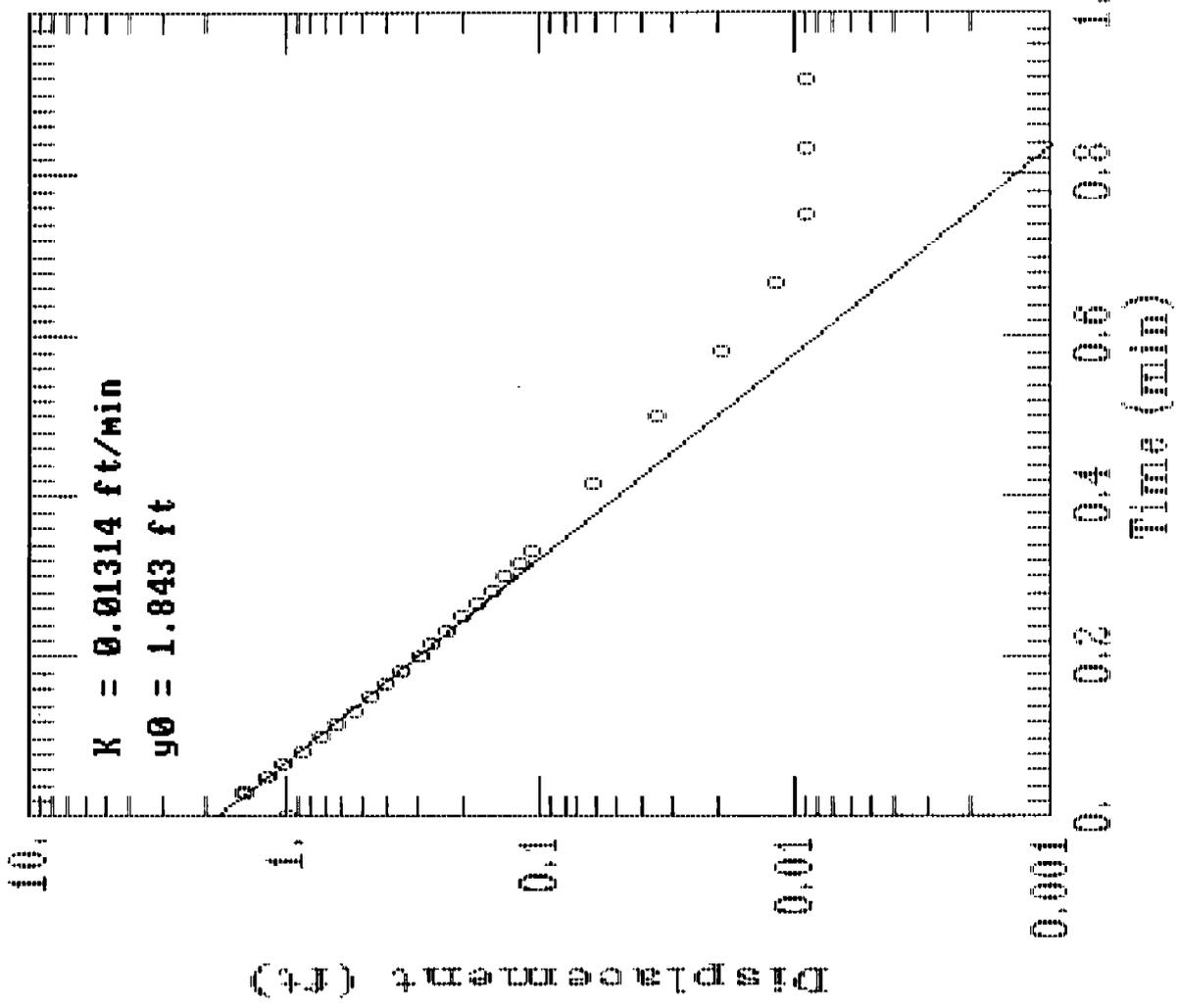
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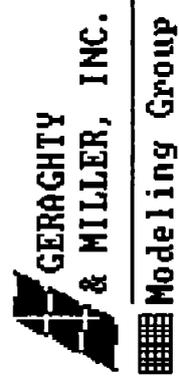
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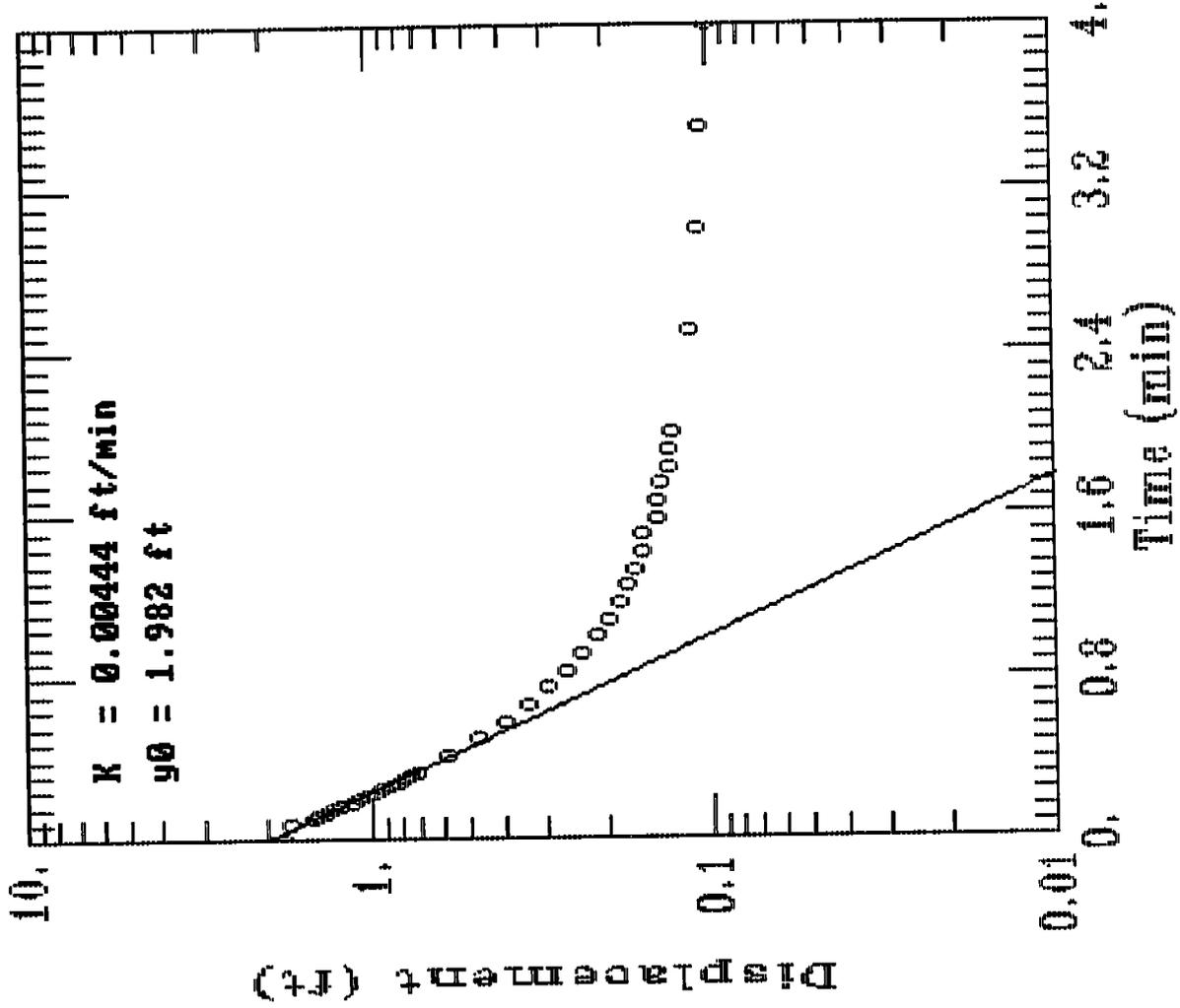
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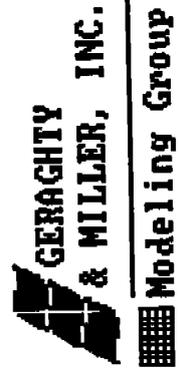
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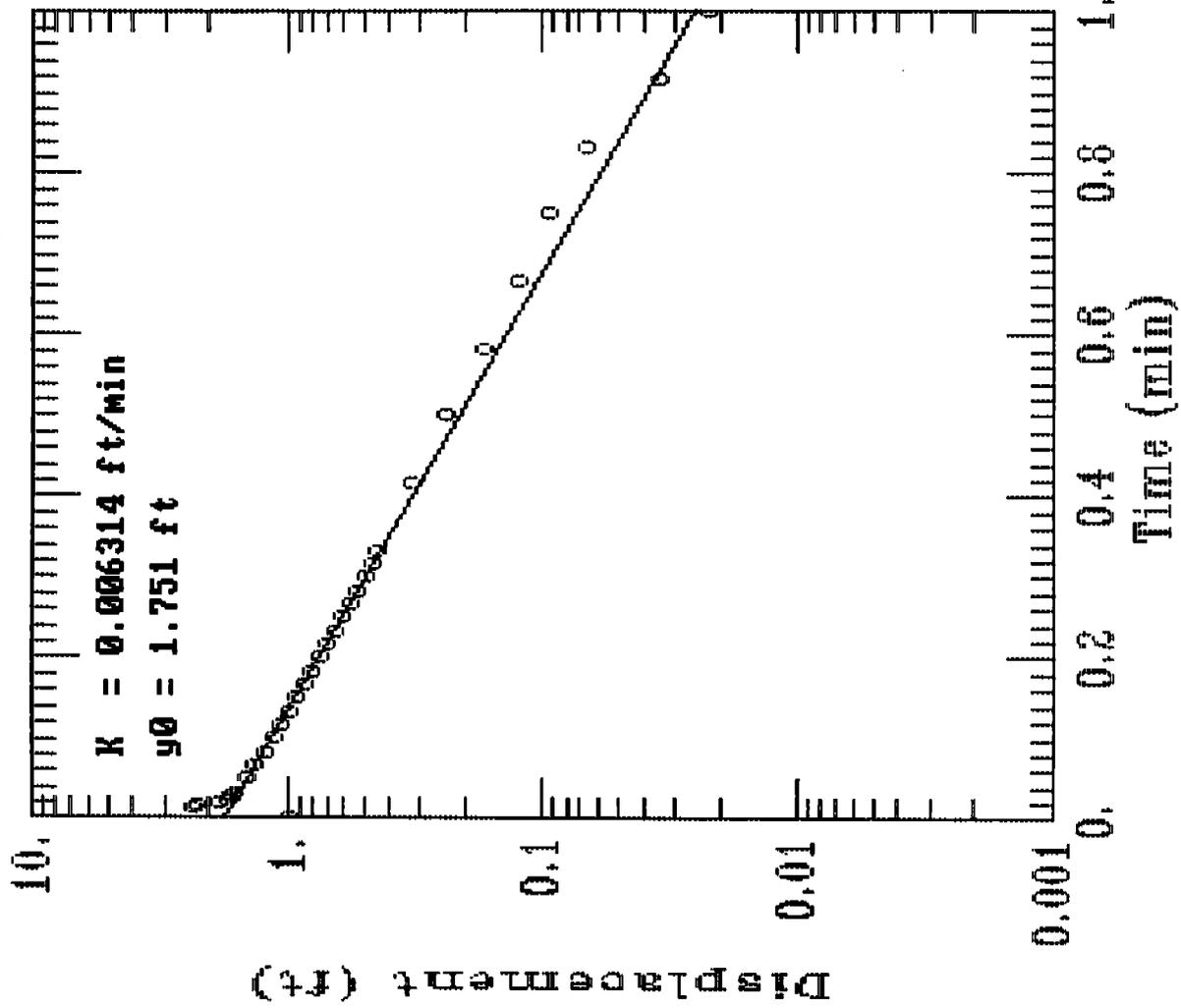
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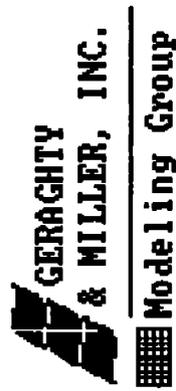
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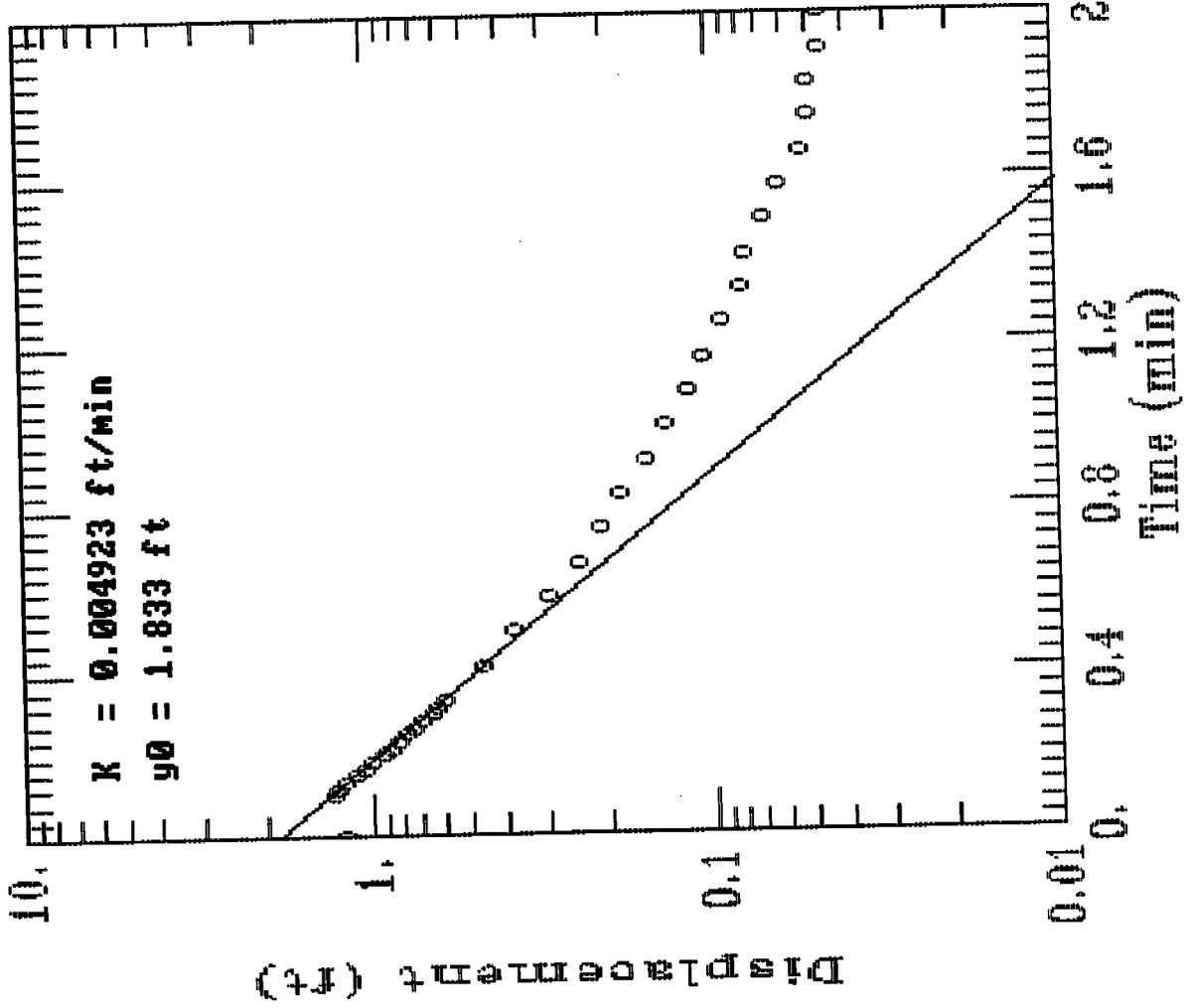
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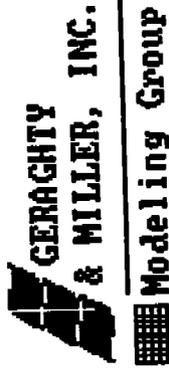
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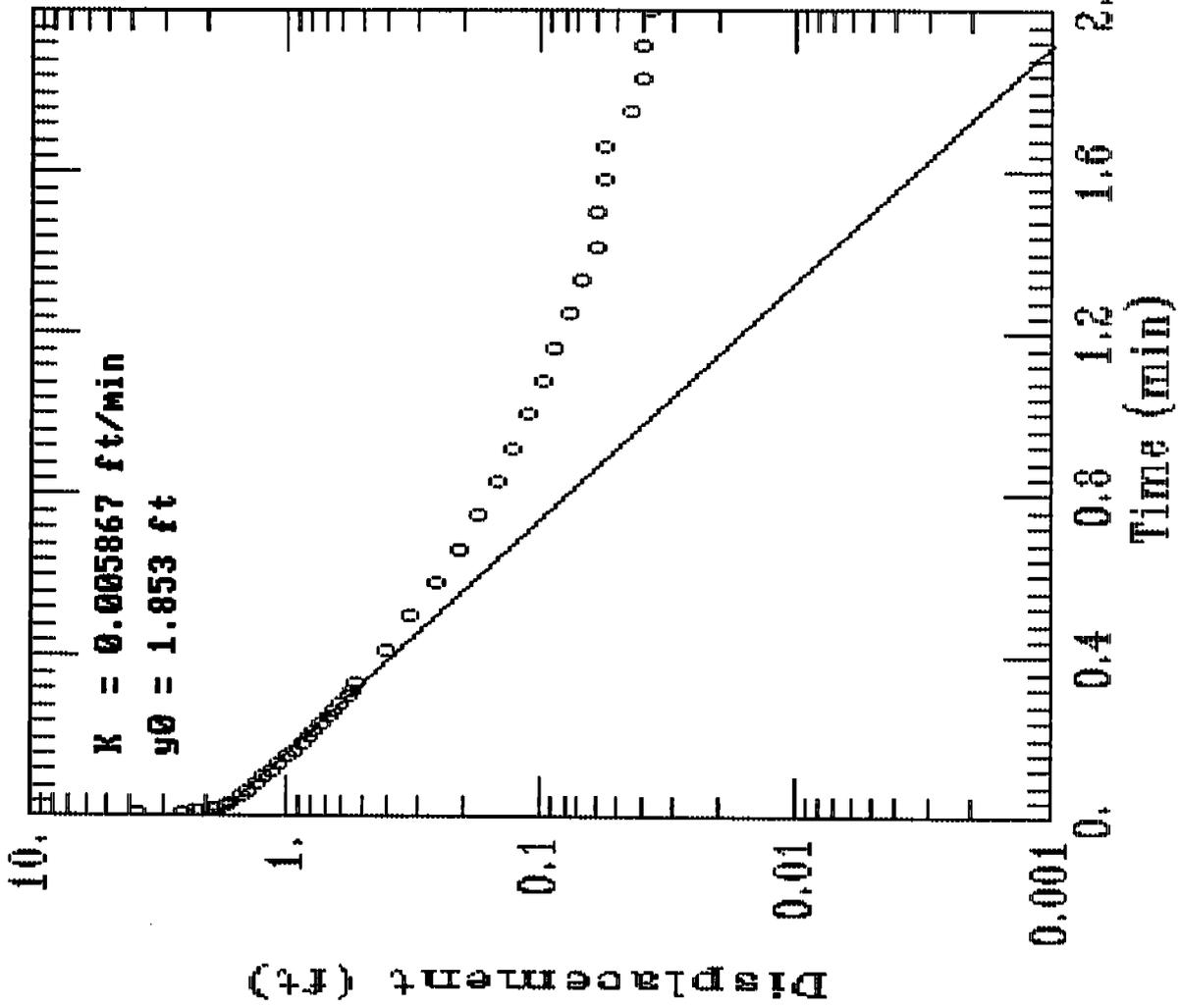
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MPT-2-P-11 RUN #4

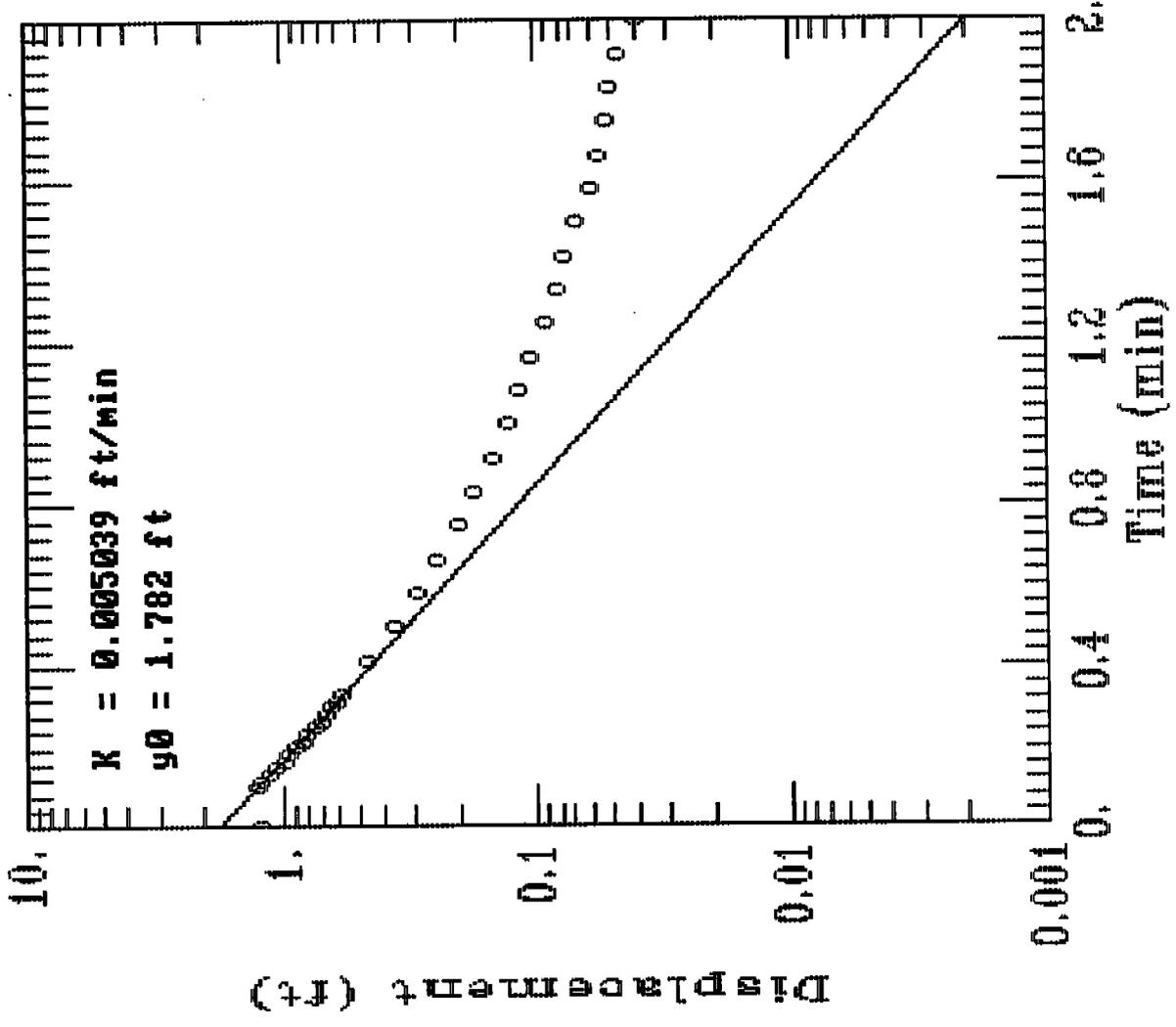


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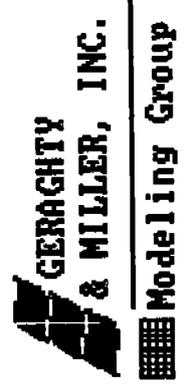
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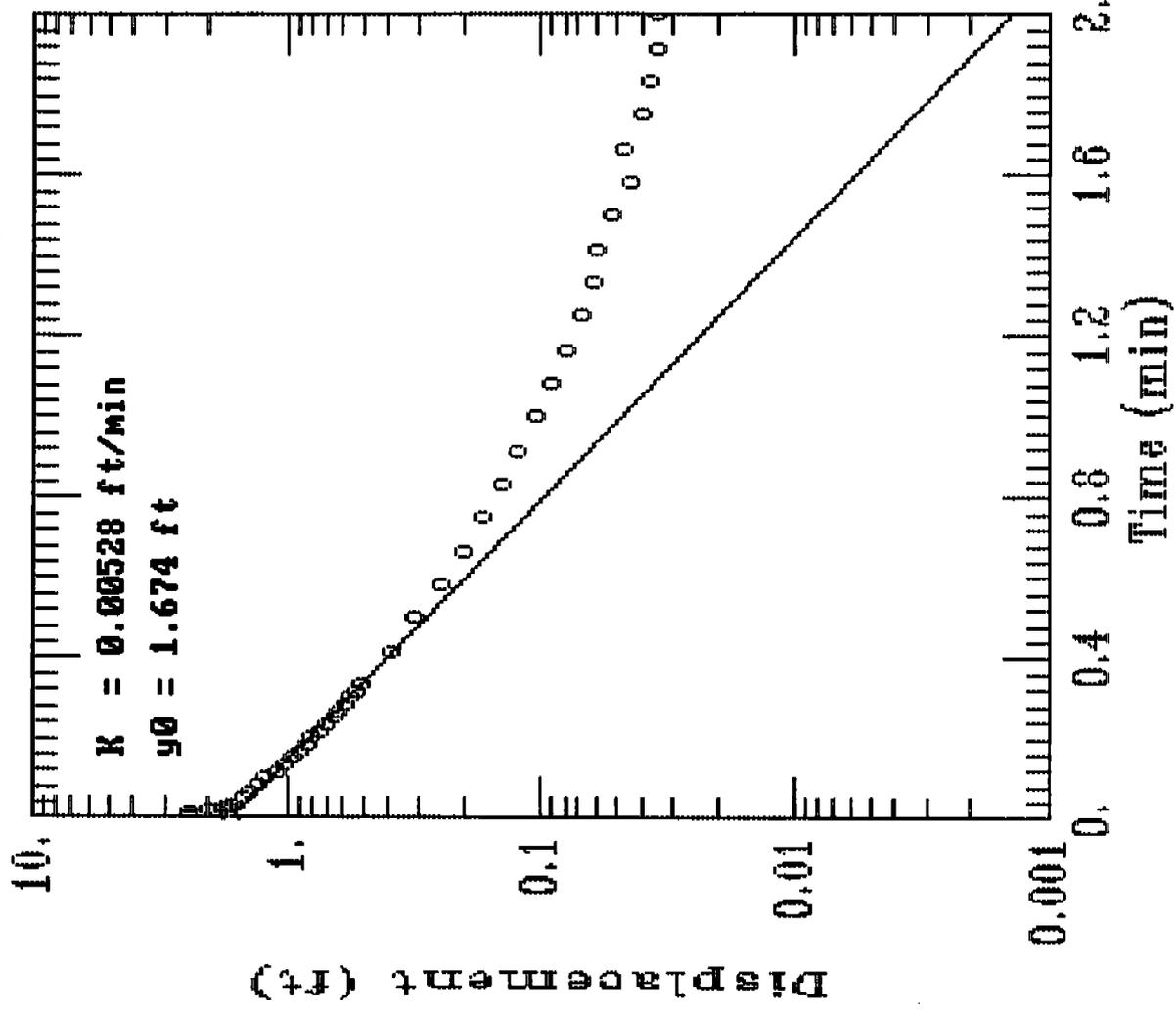
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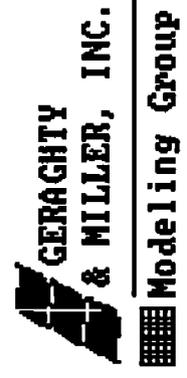
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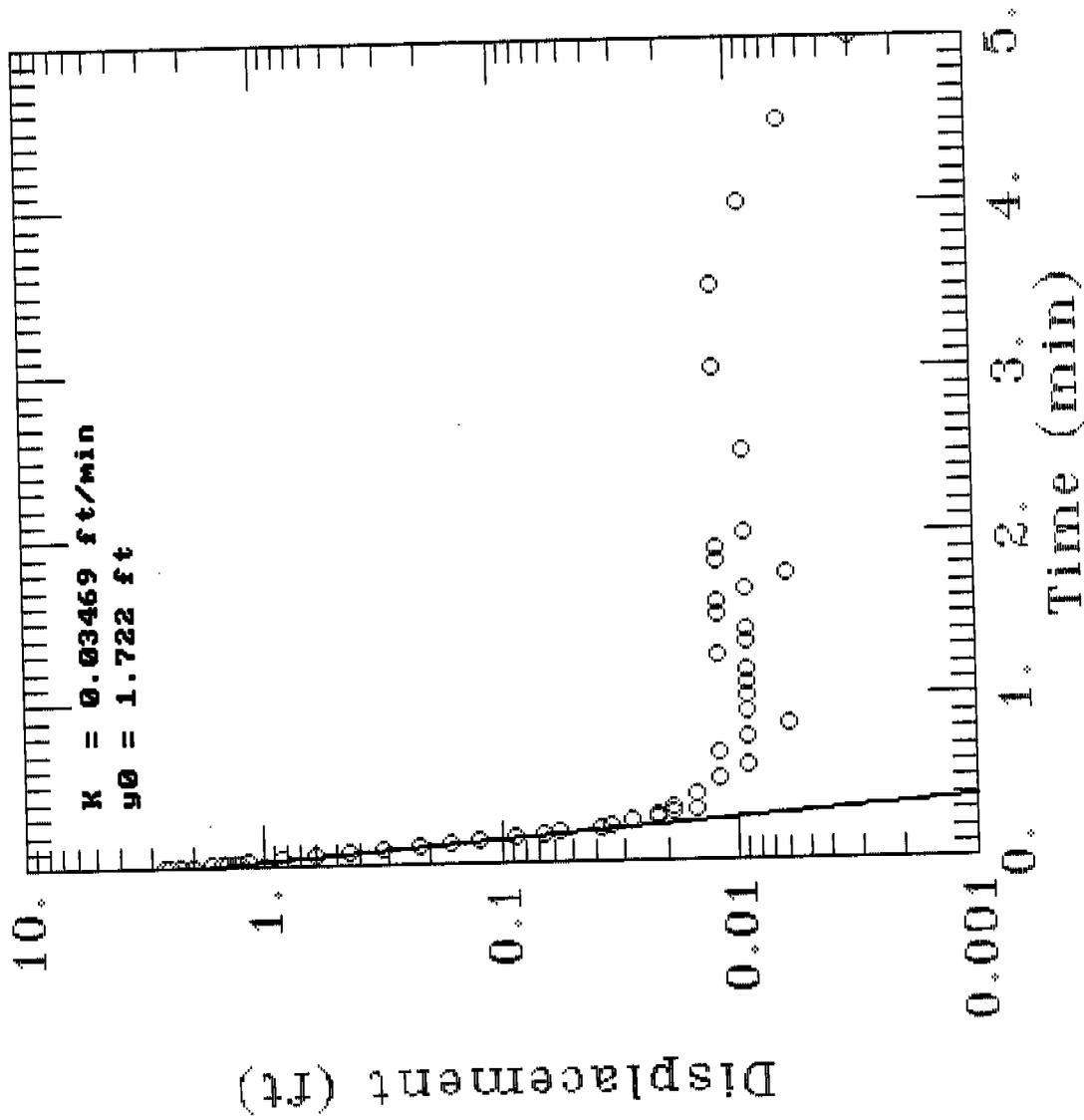
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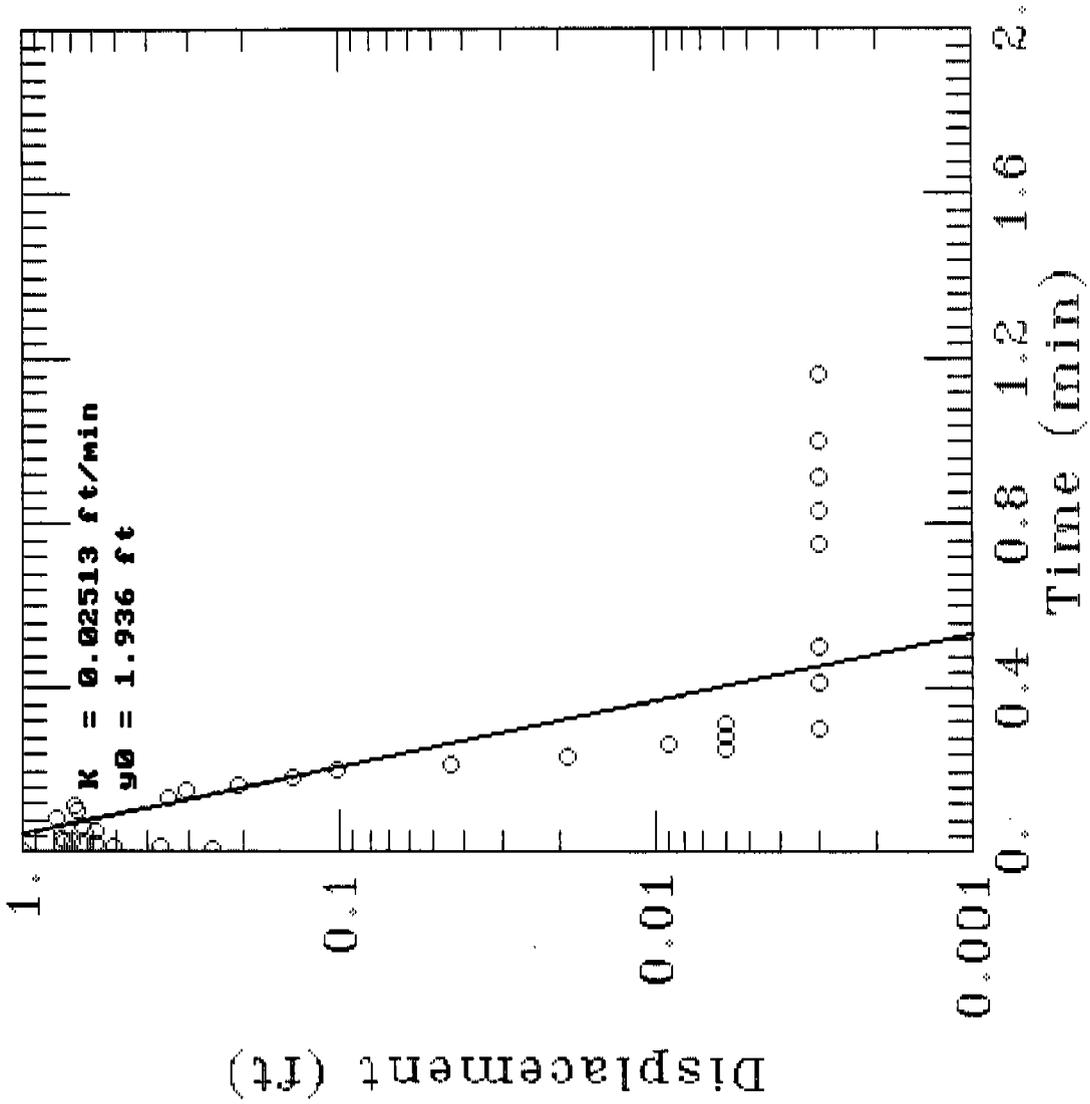
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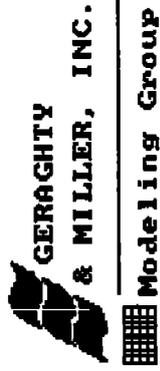
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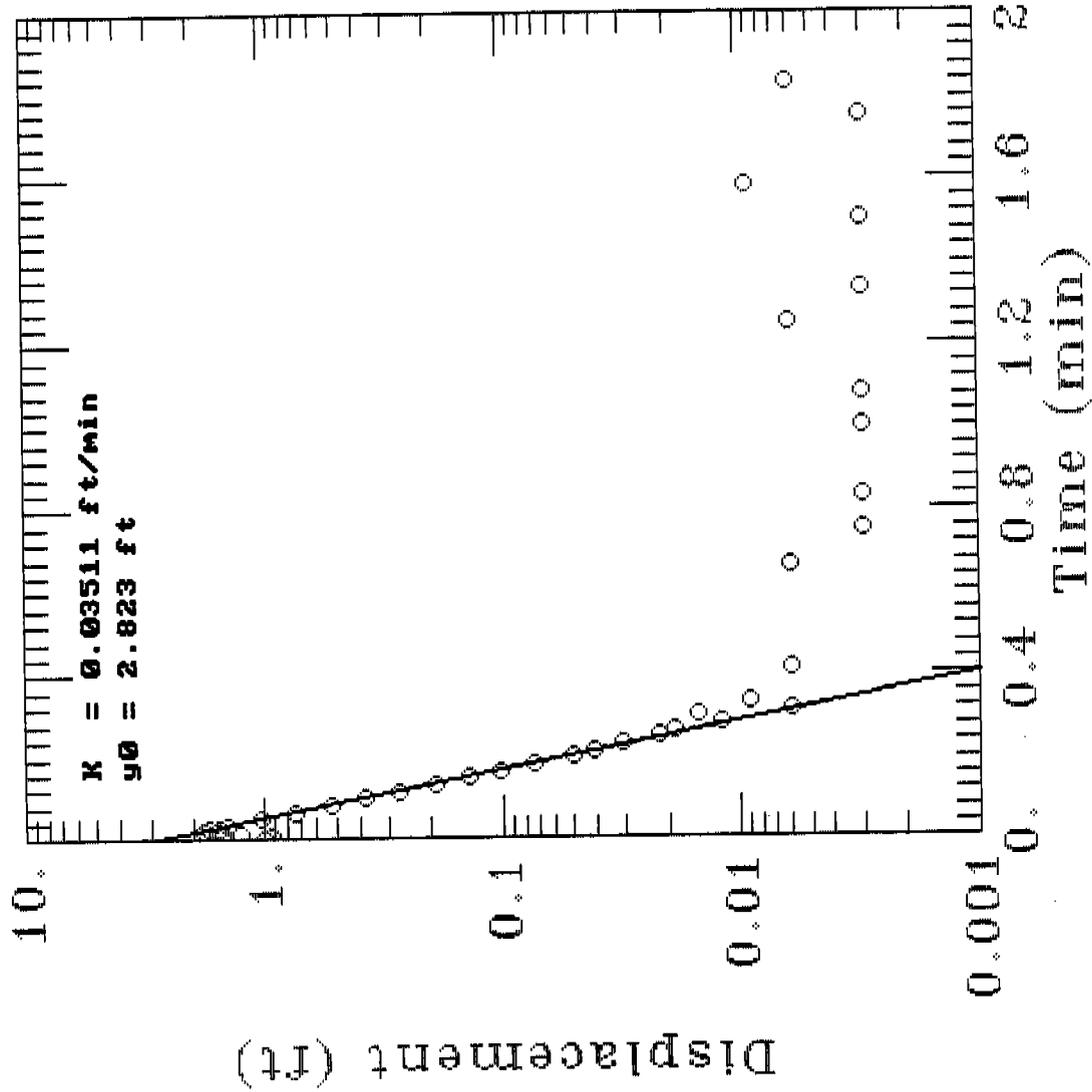
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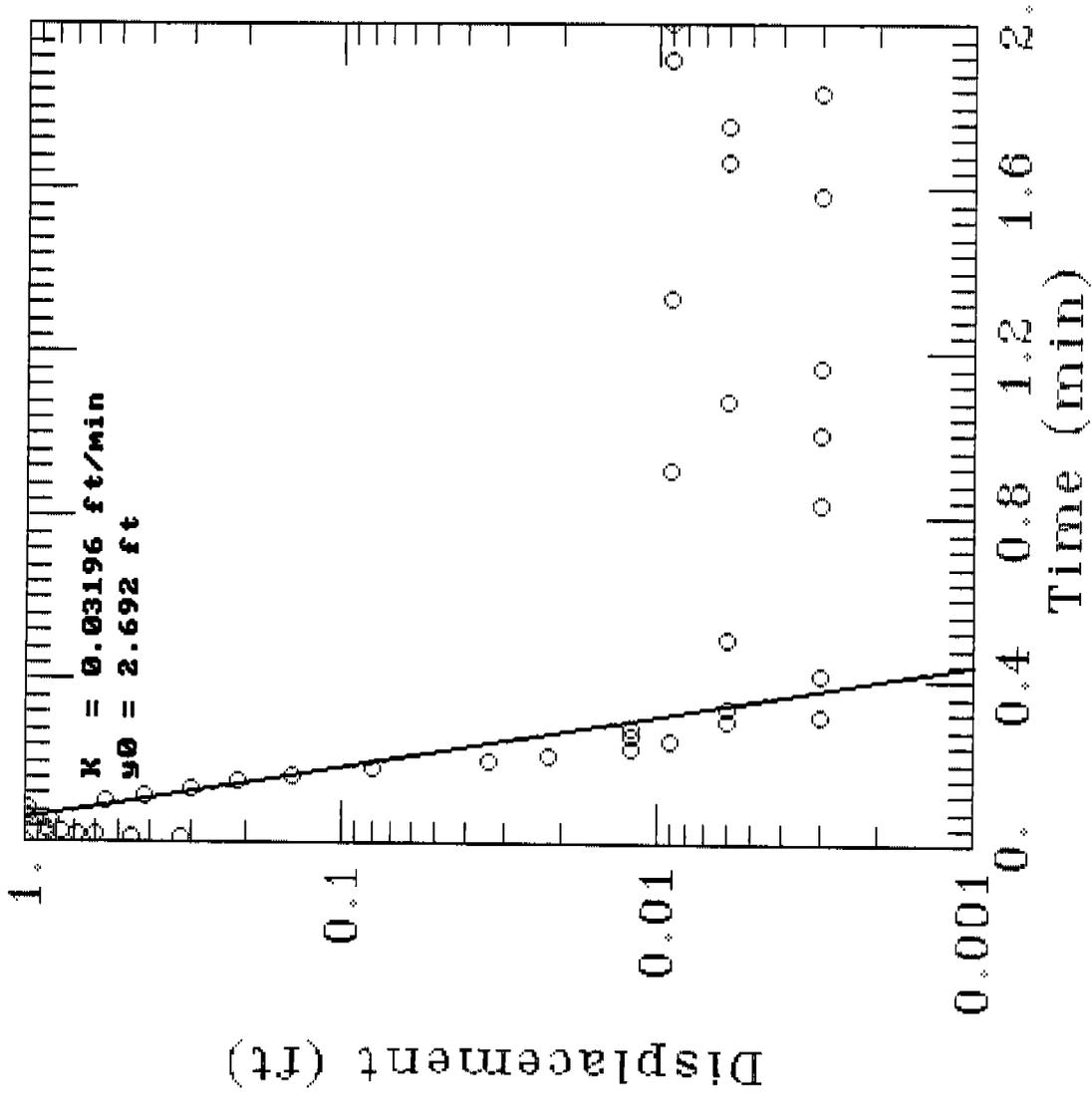
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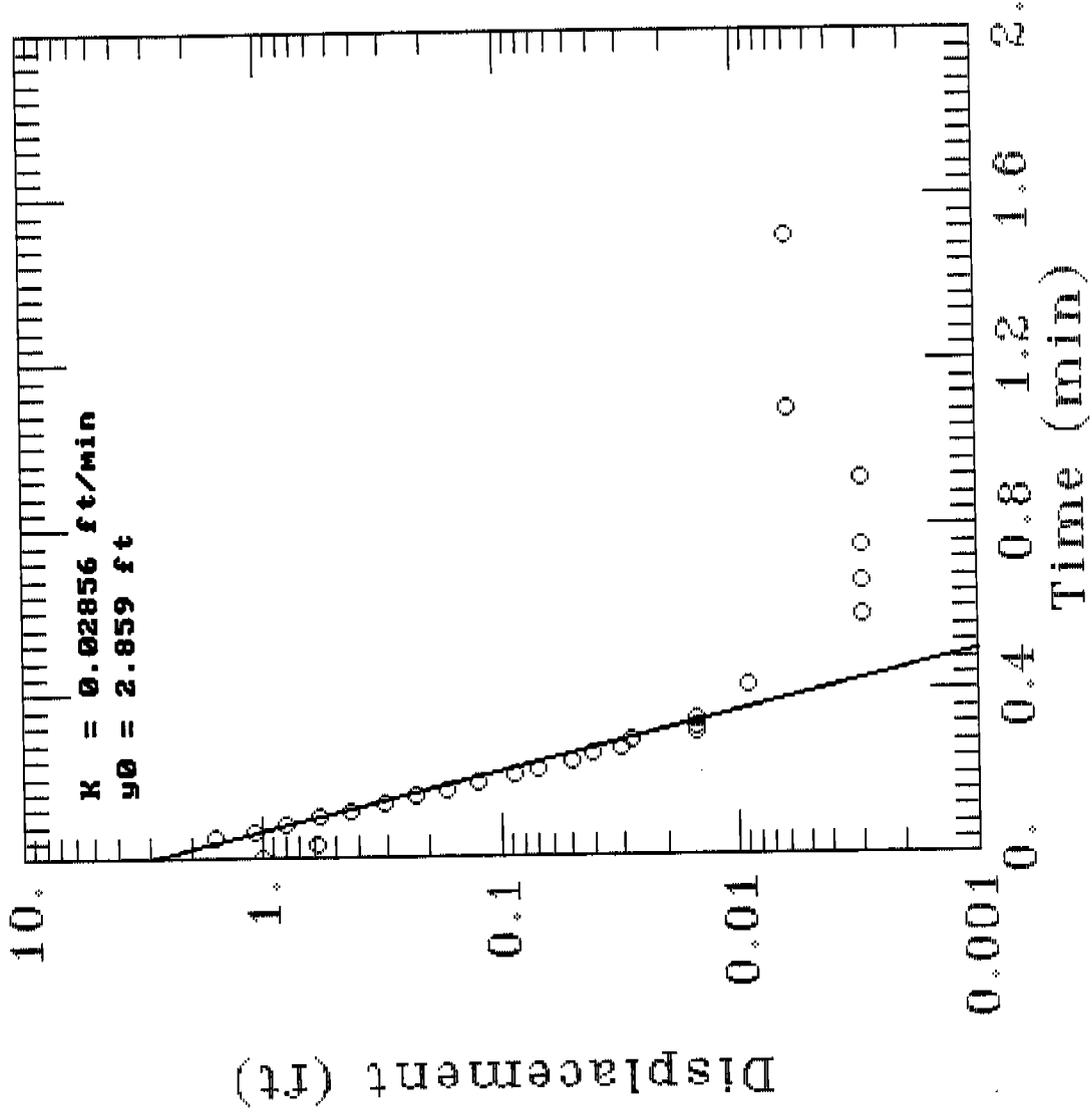


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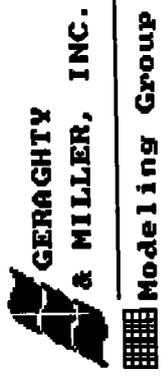
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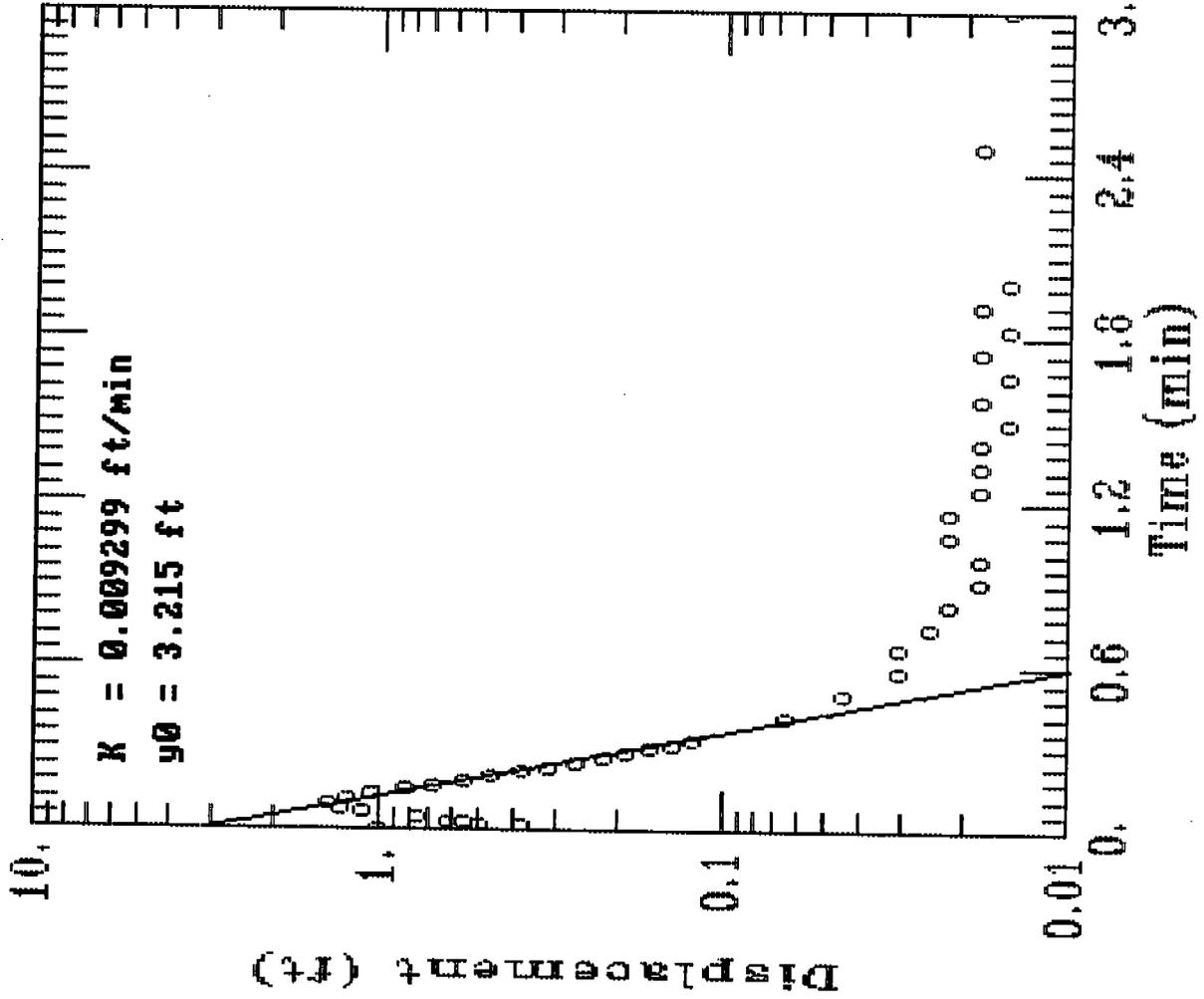
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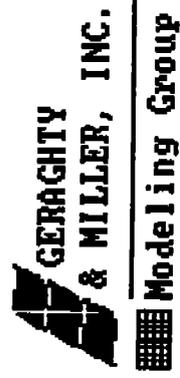
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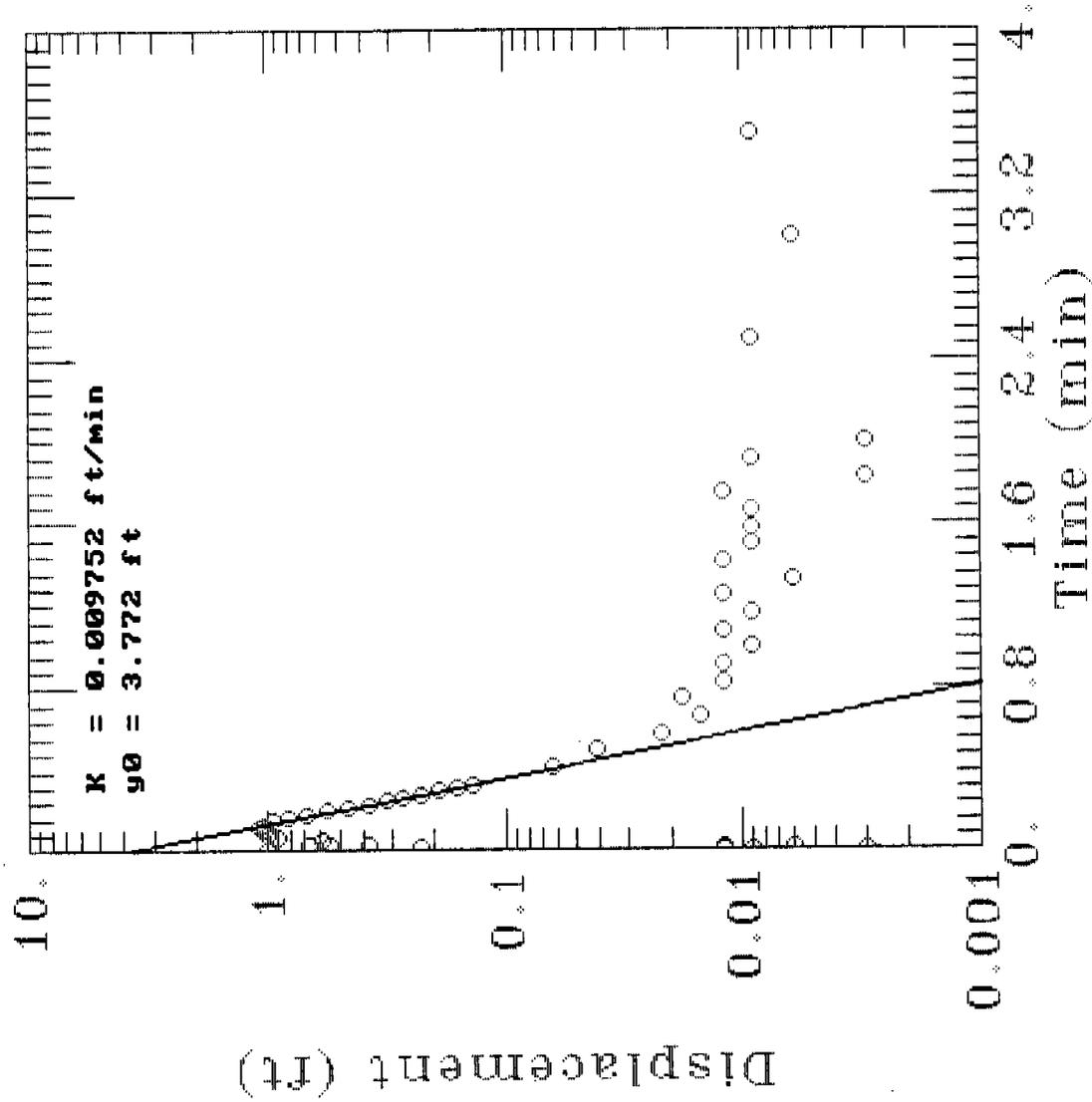
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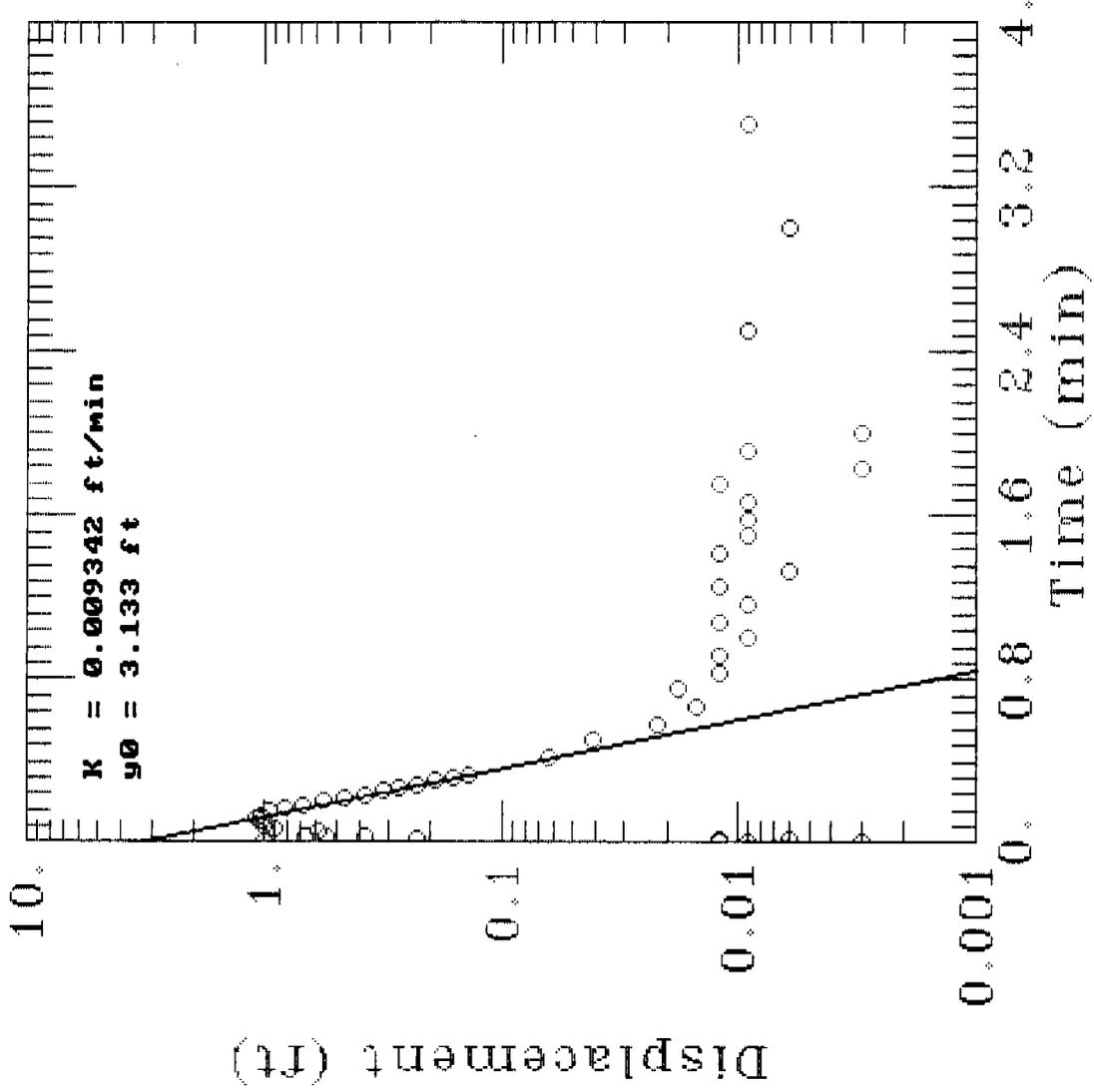


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MAYPORT MPT2-15D-S2



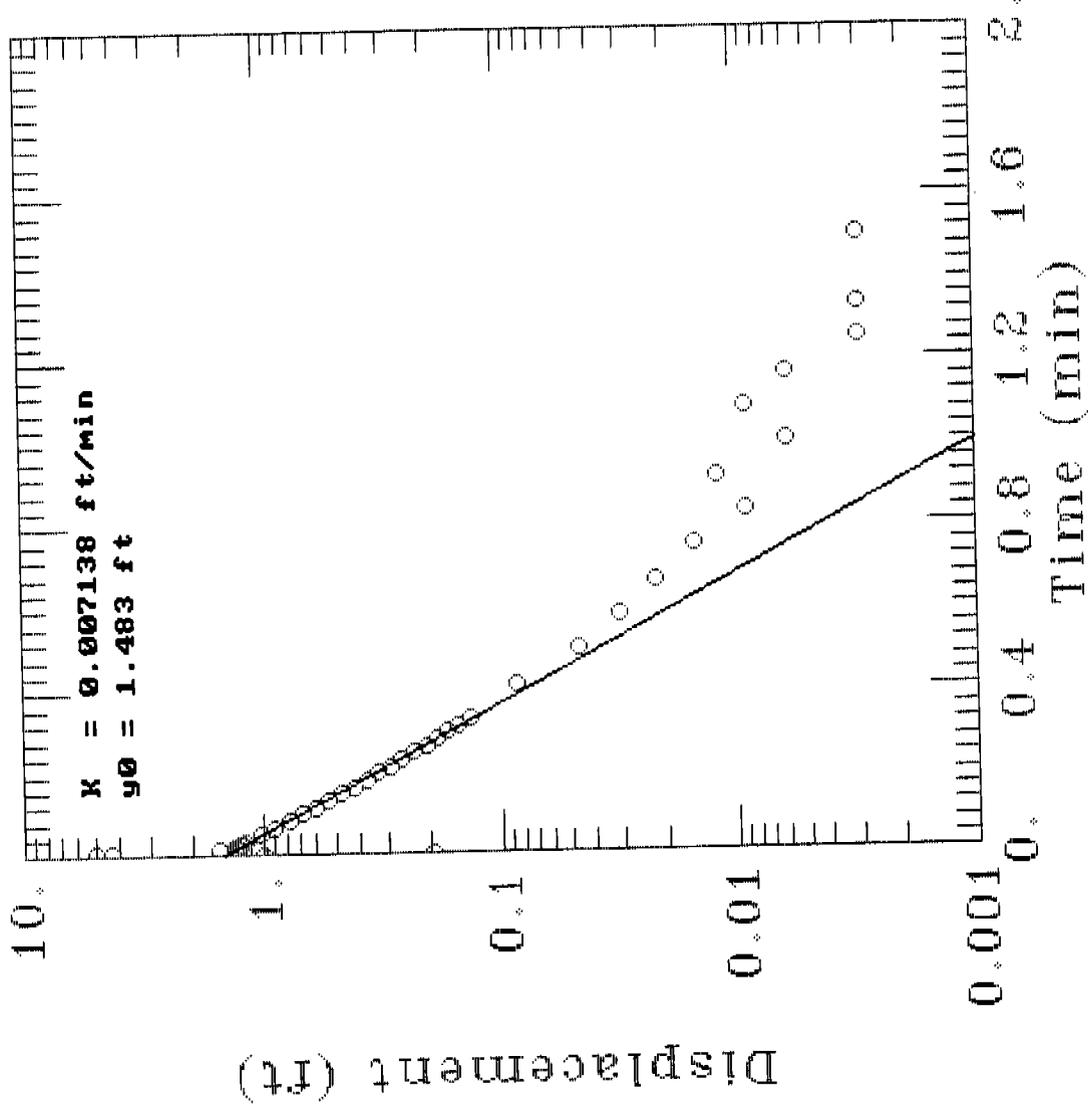
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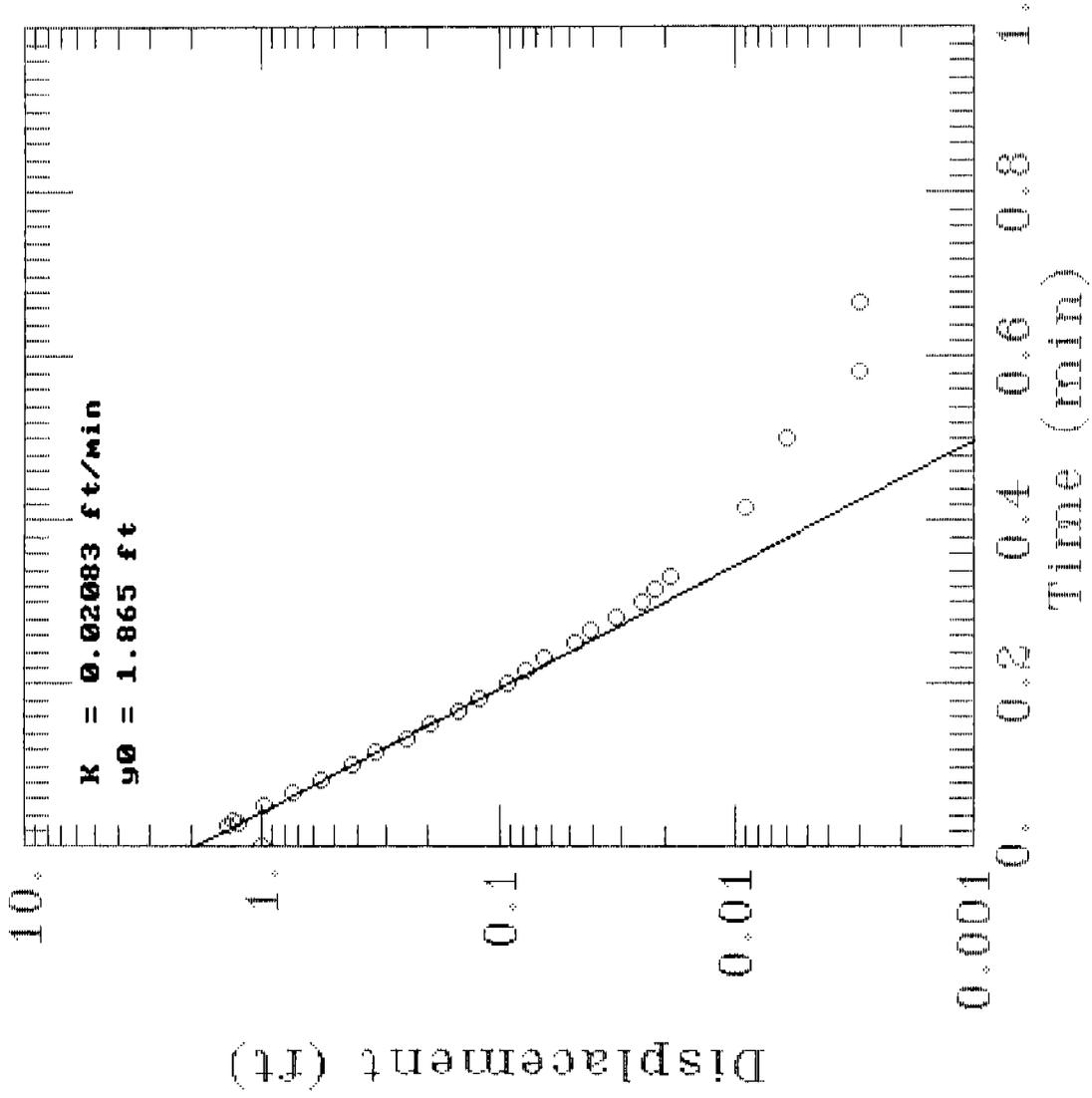


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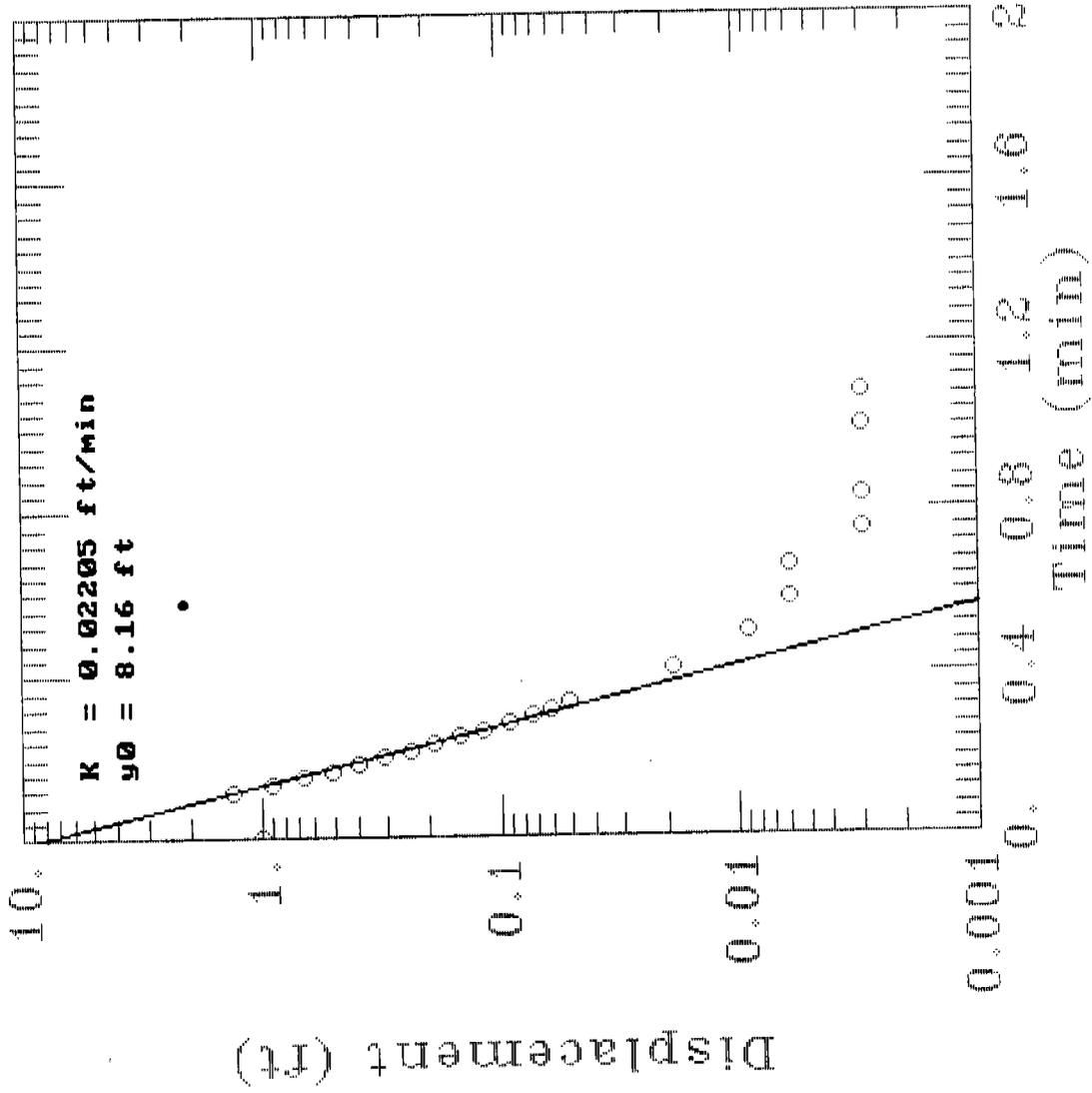
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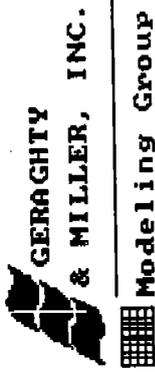


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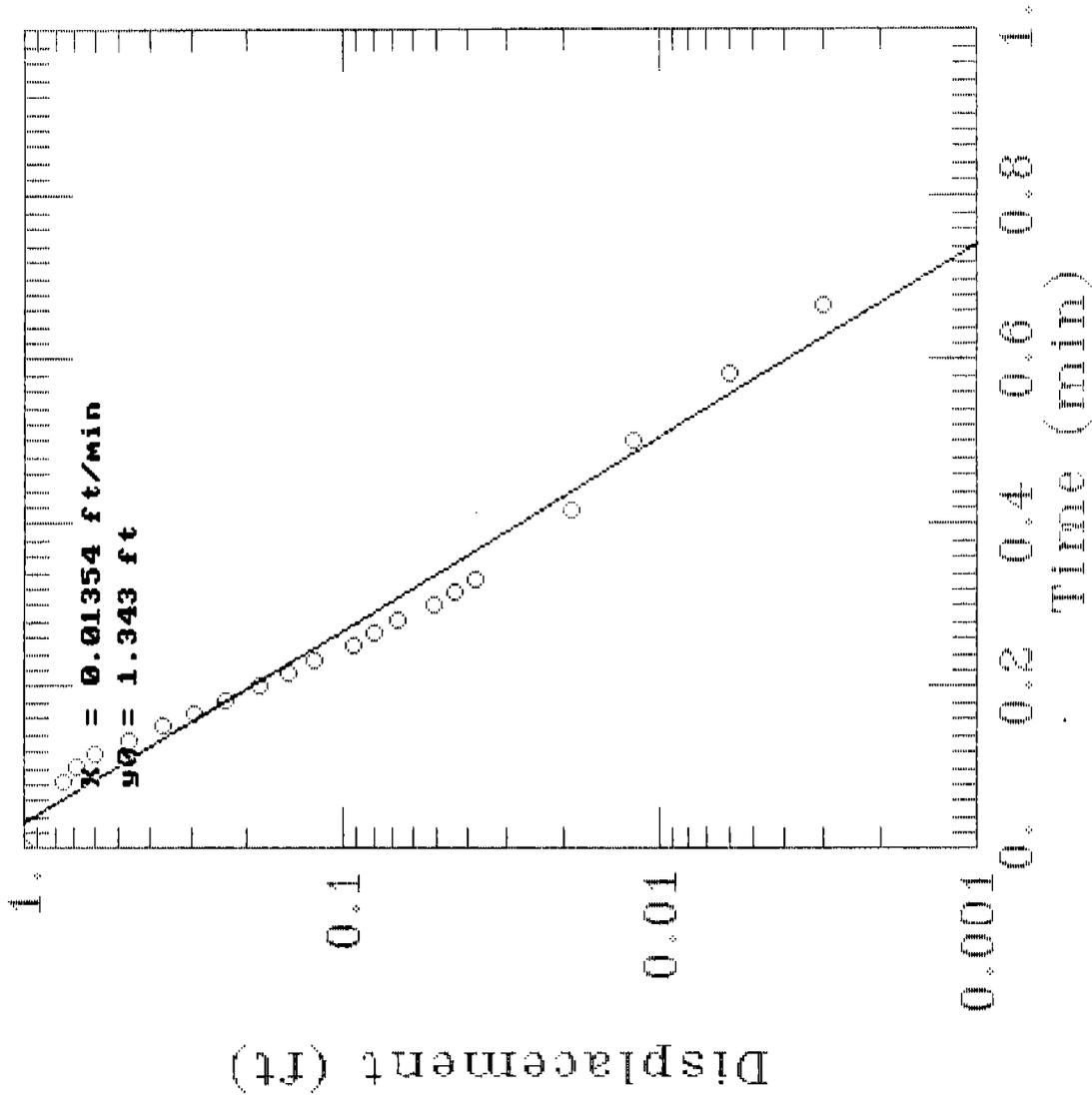
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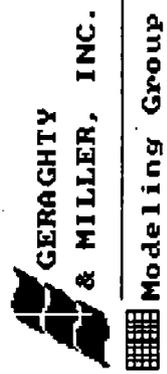
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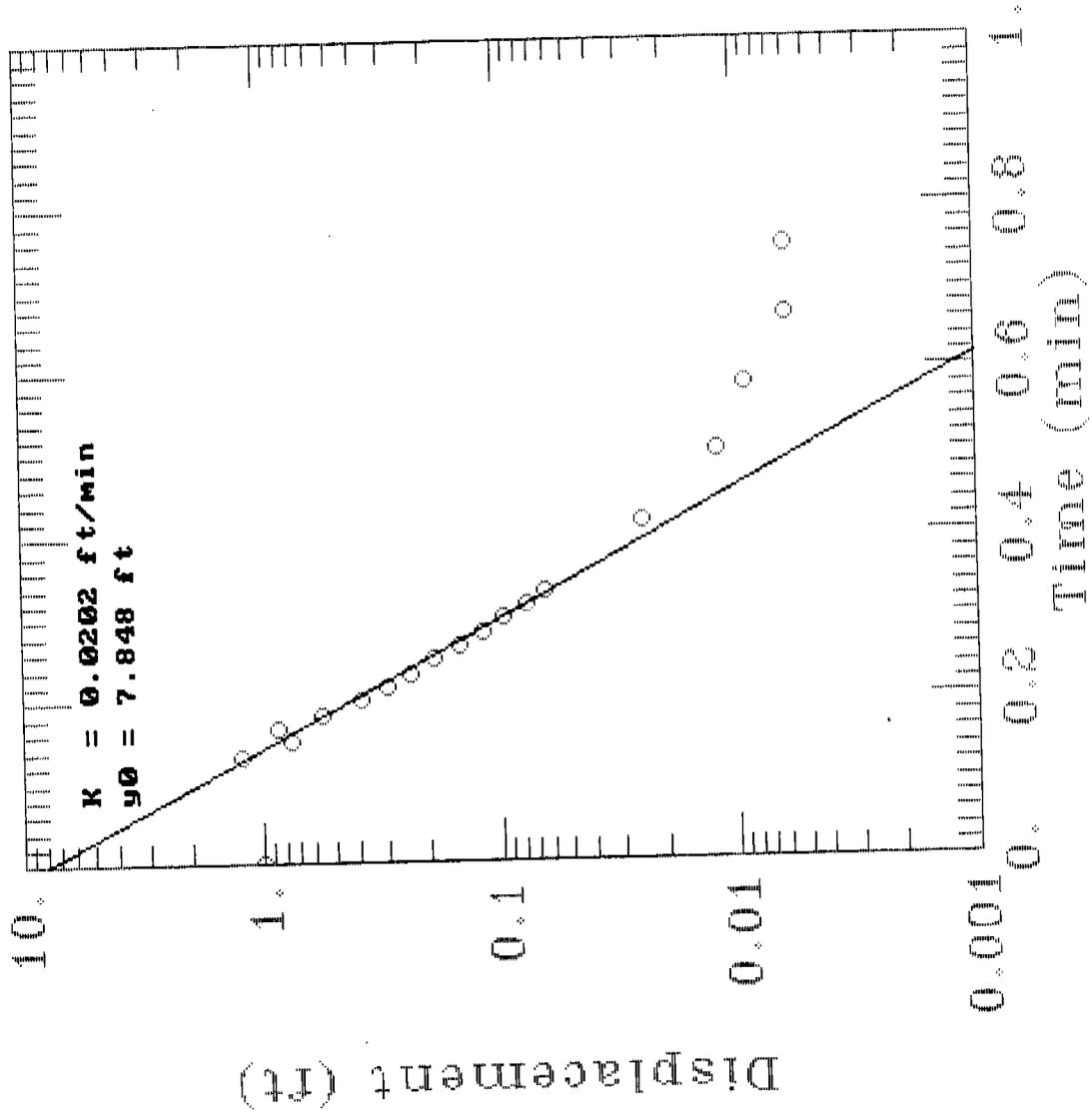
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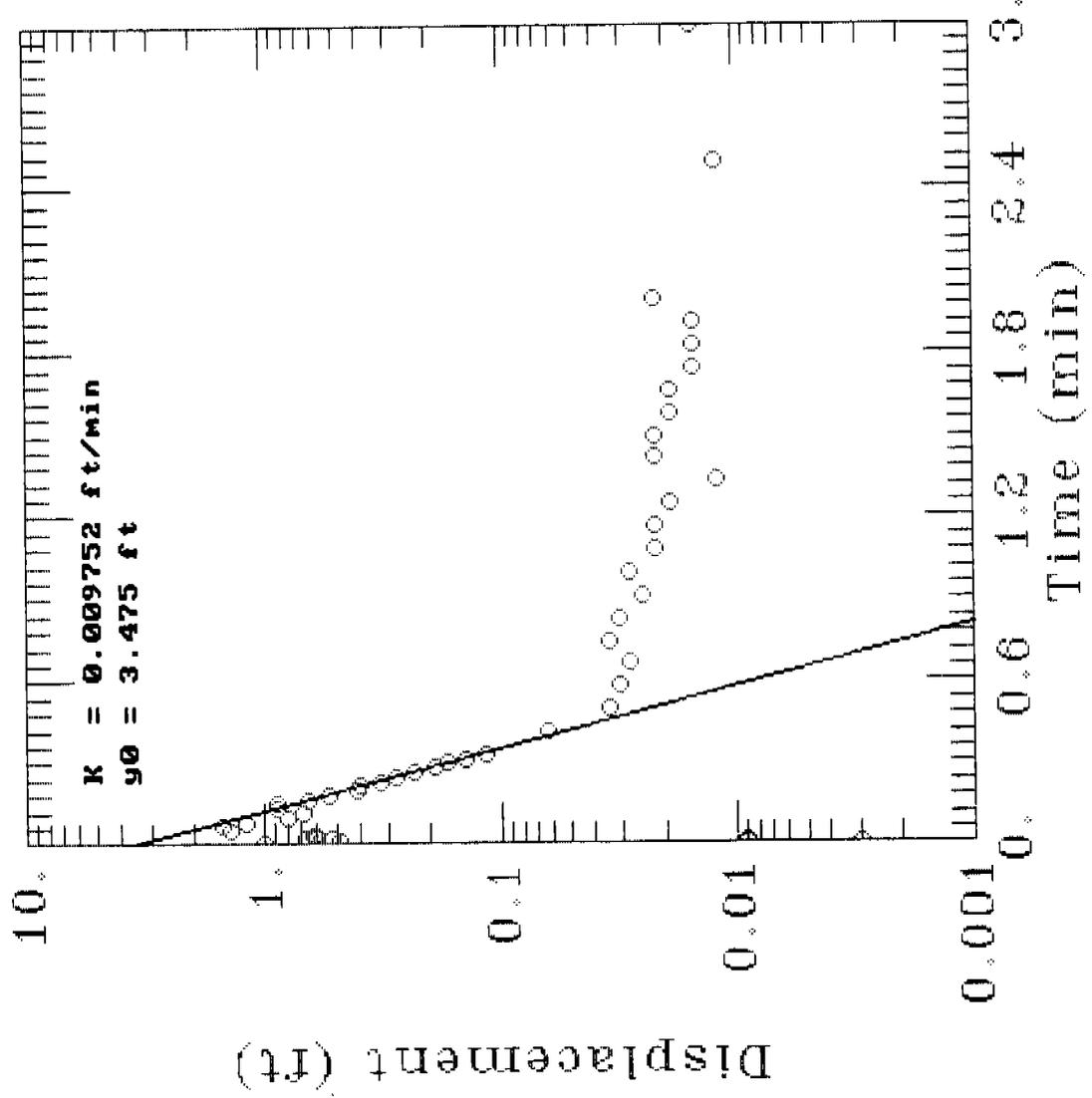


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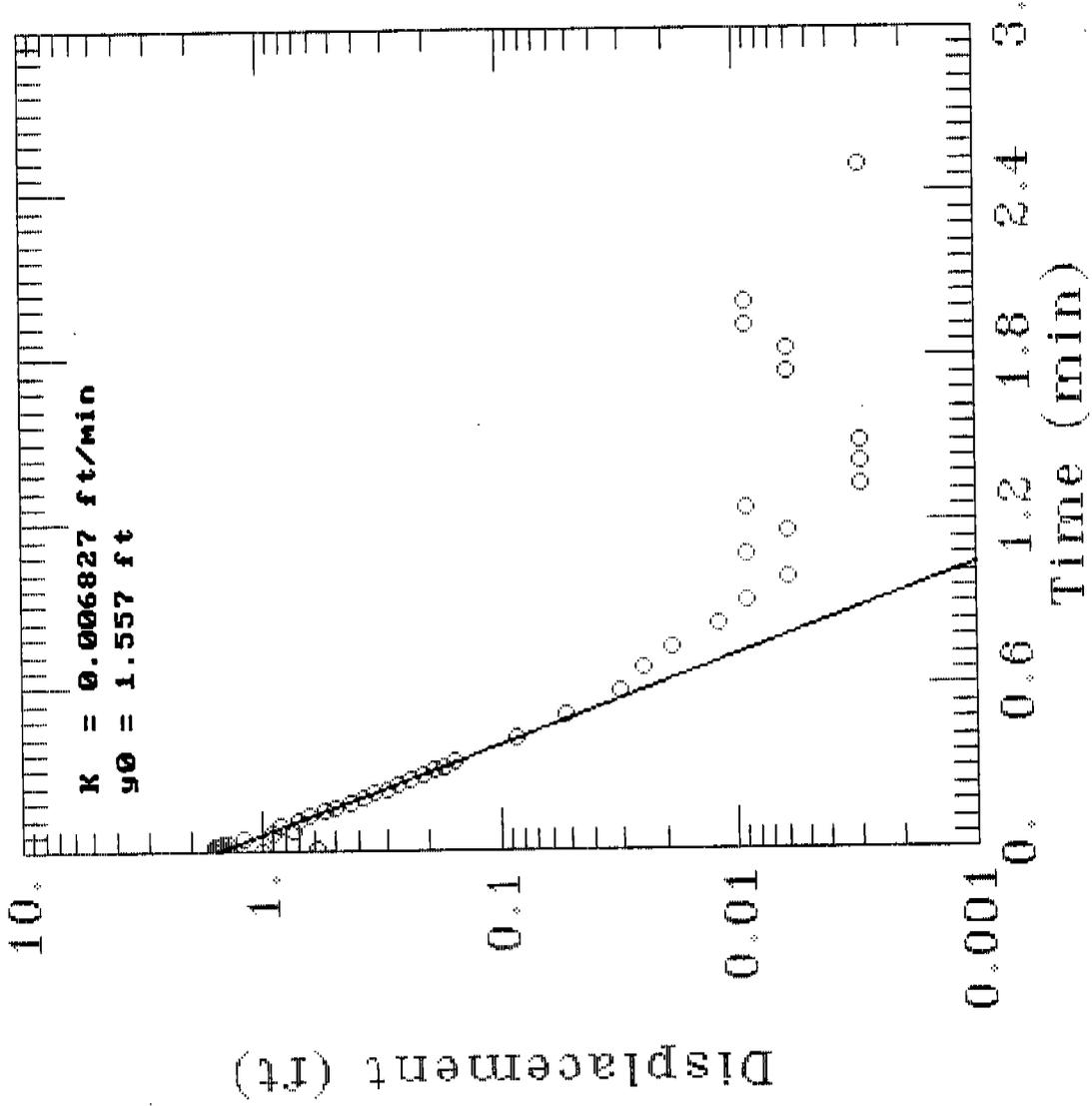


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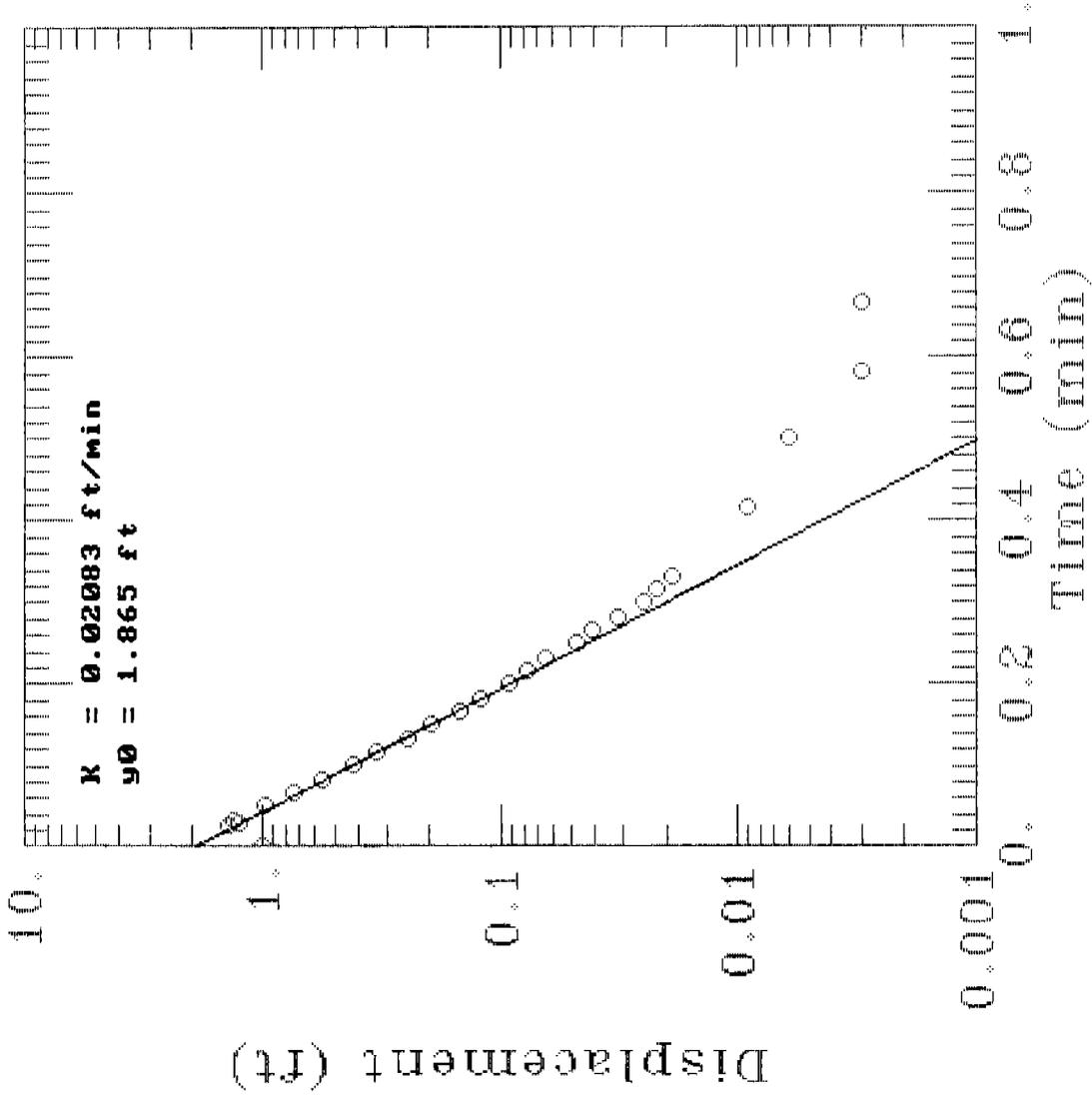


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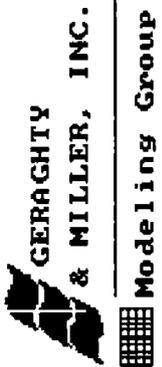
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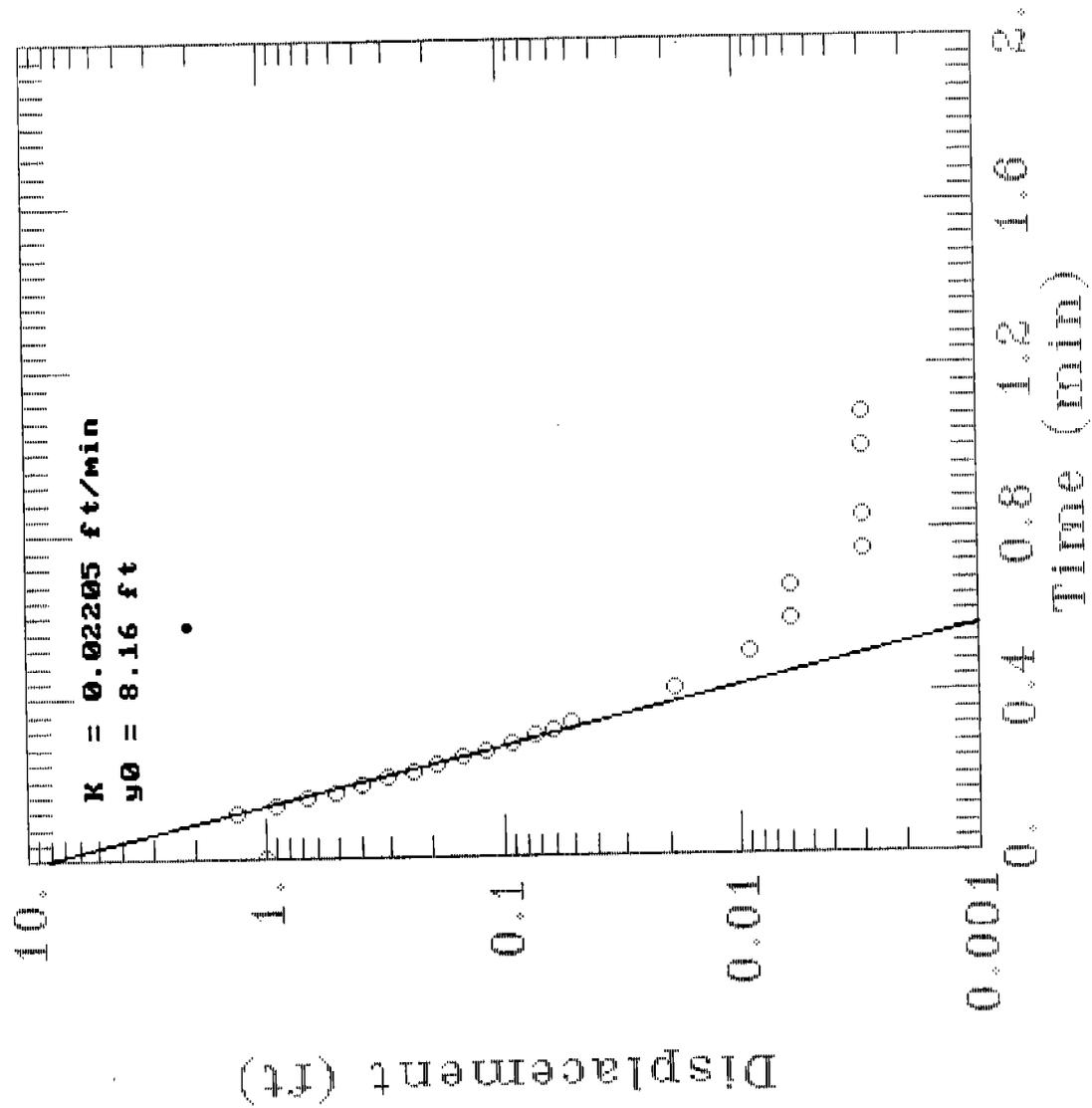
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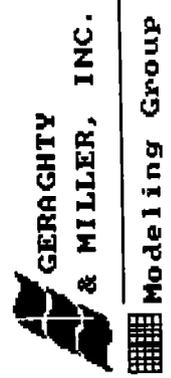
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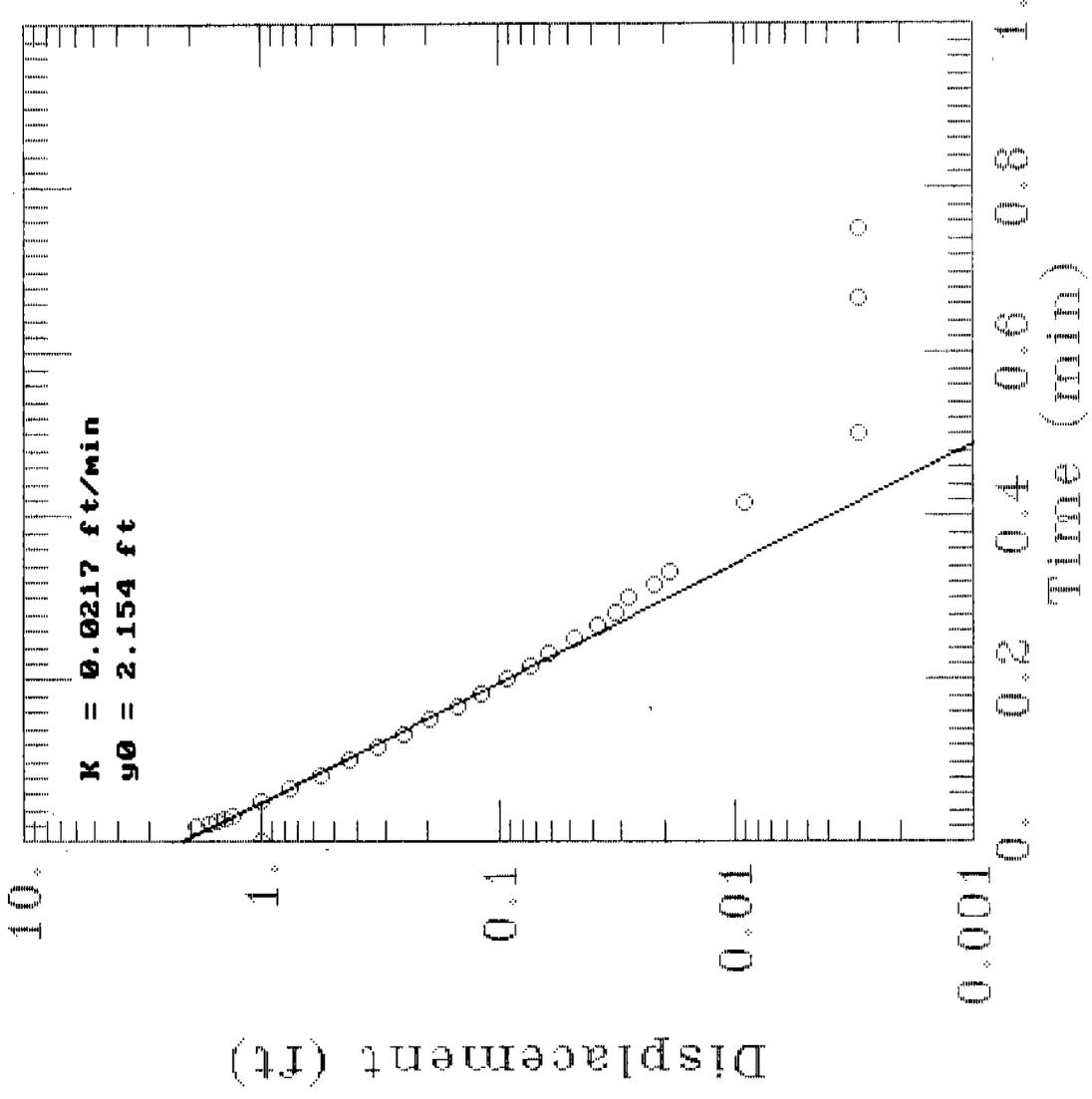
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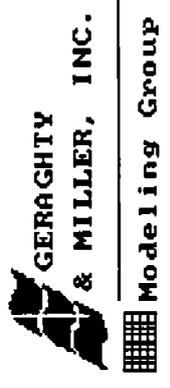
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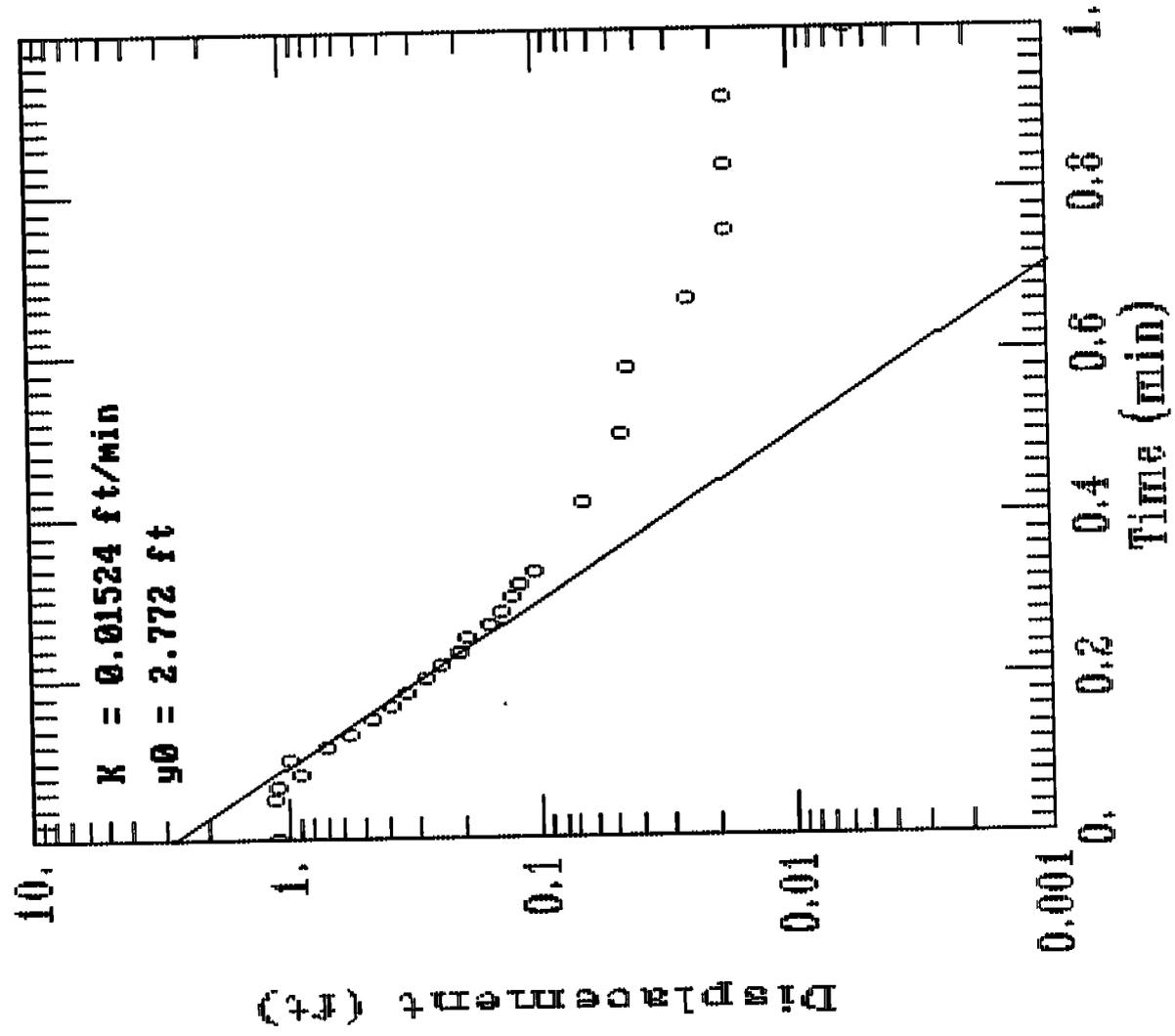
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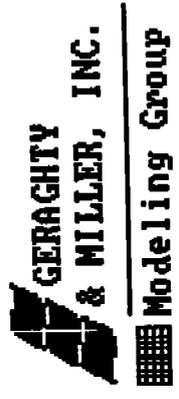
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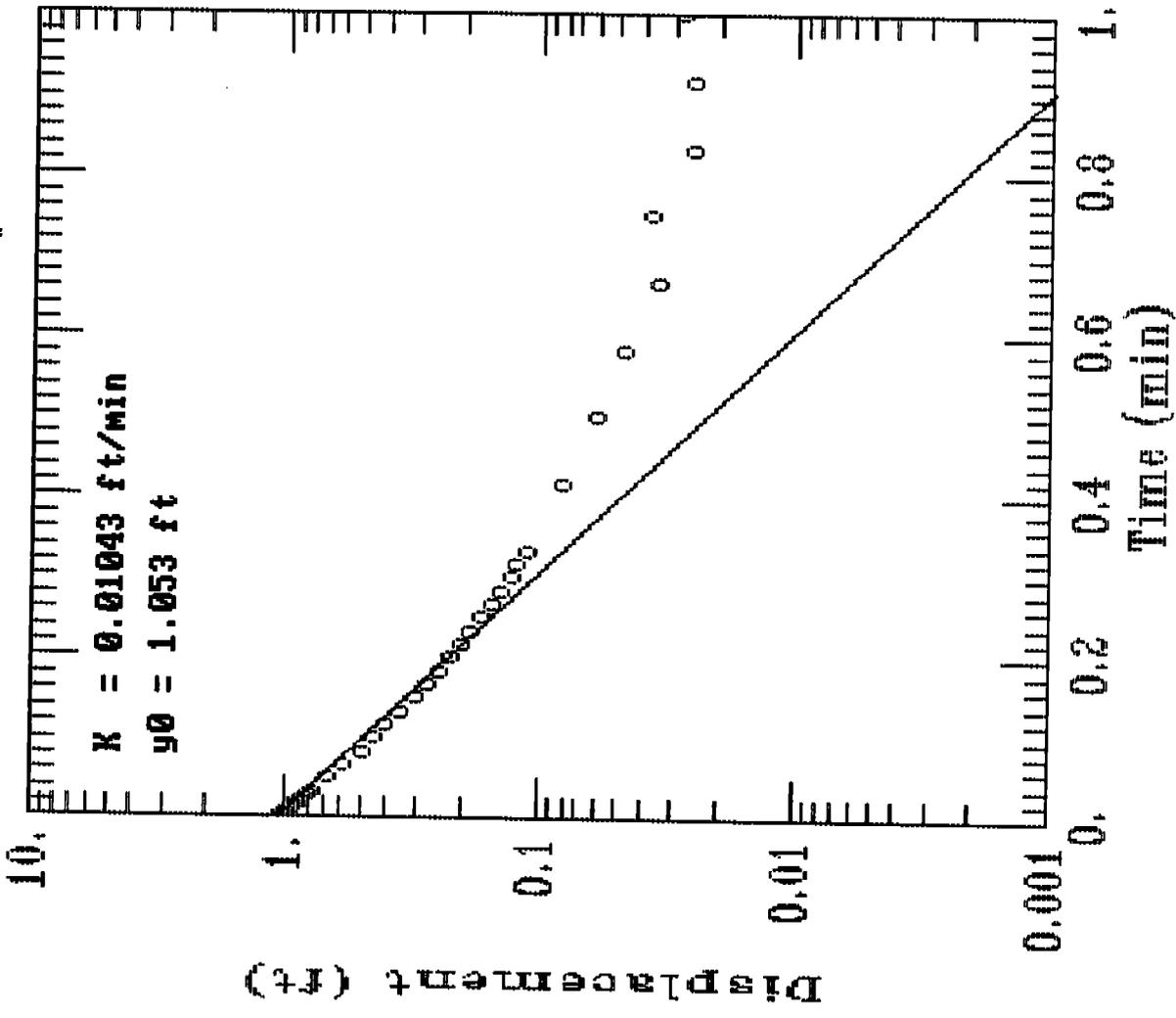
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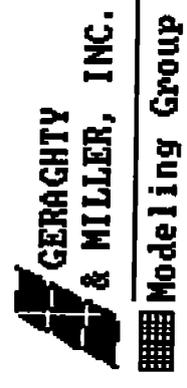
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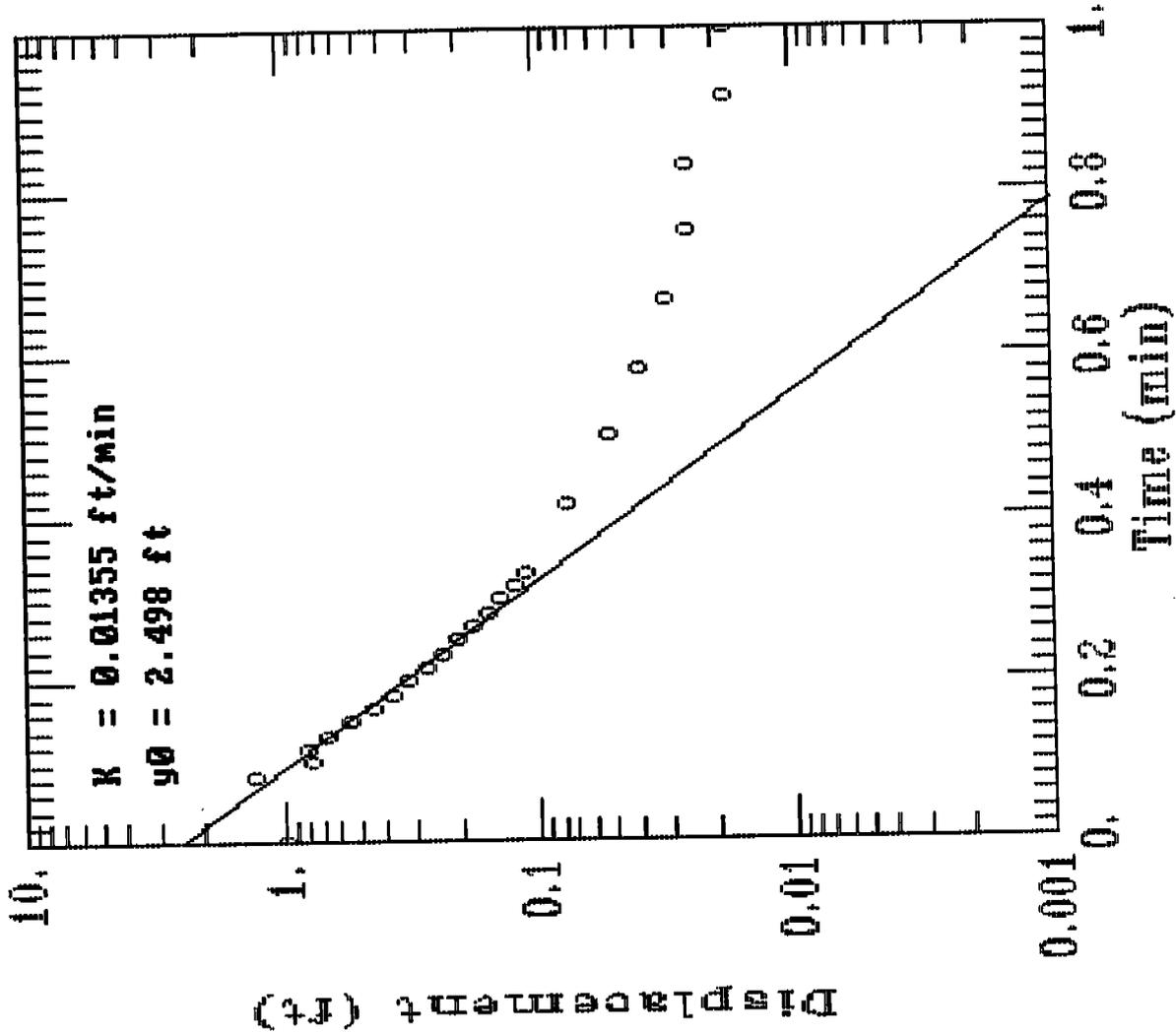
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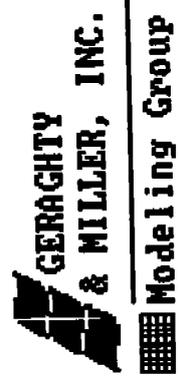
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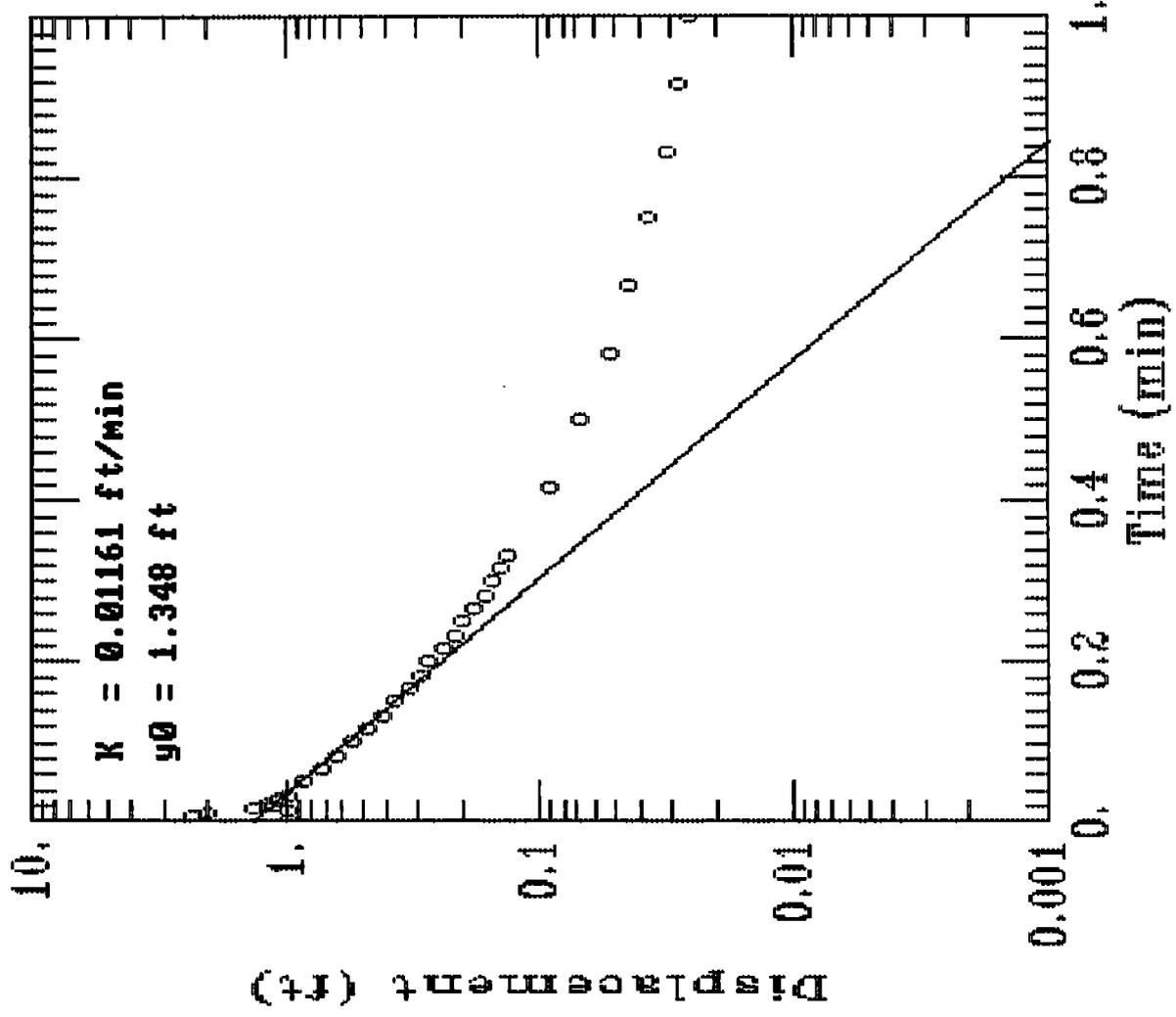
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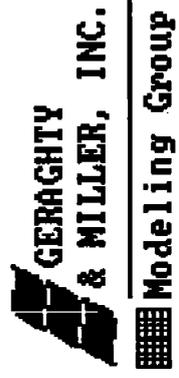
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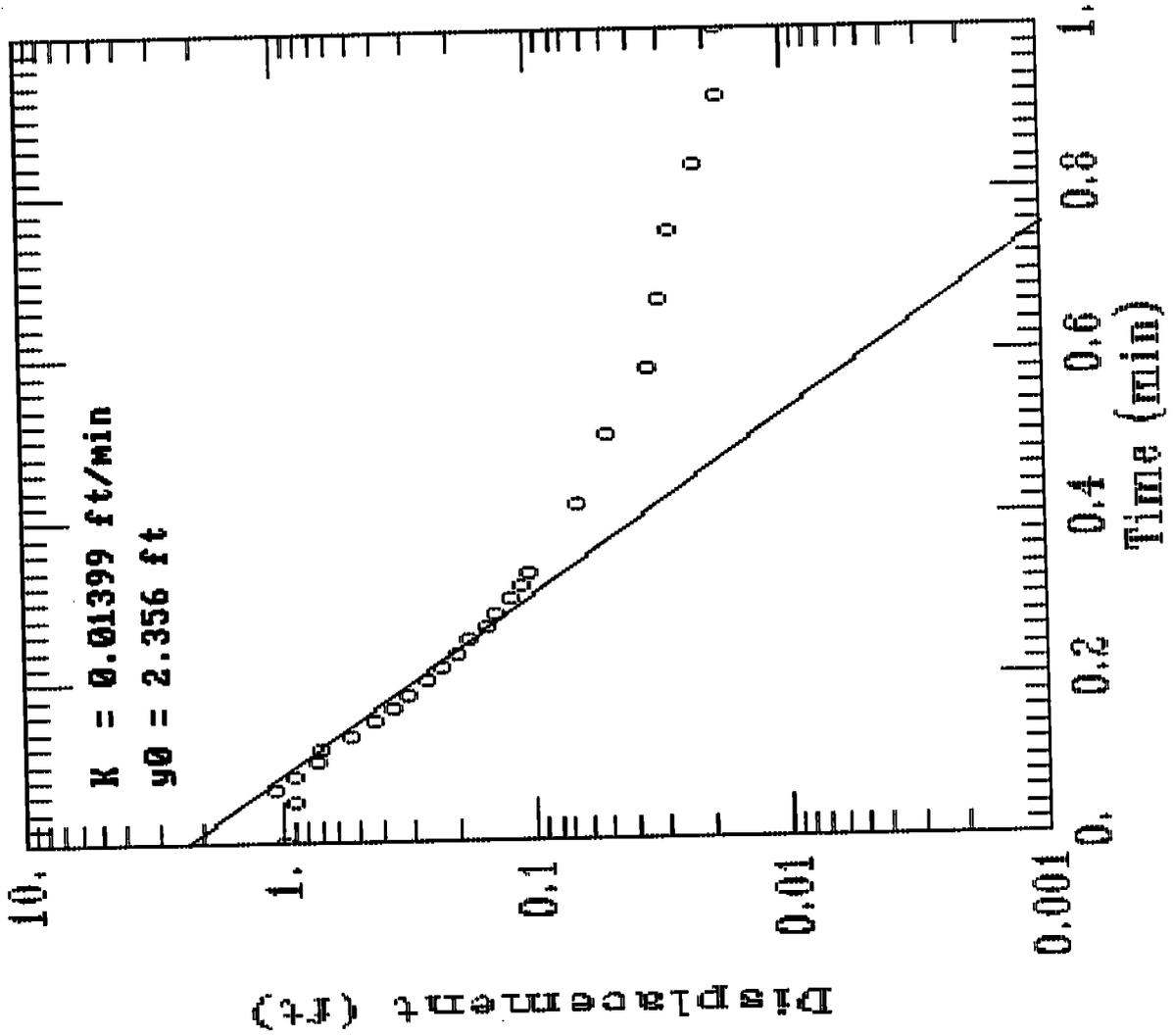
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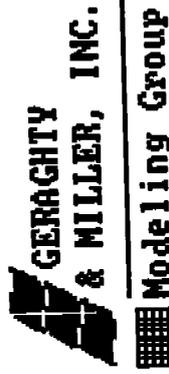
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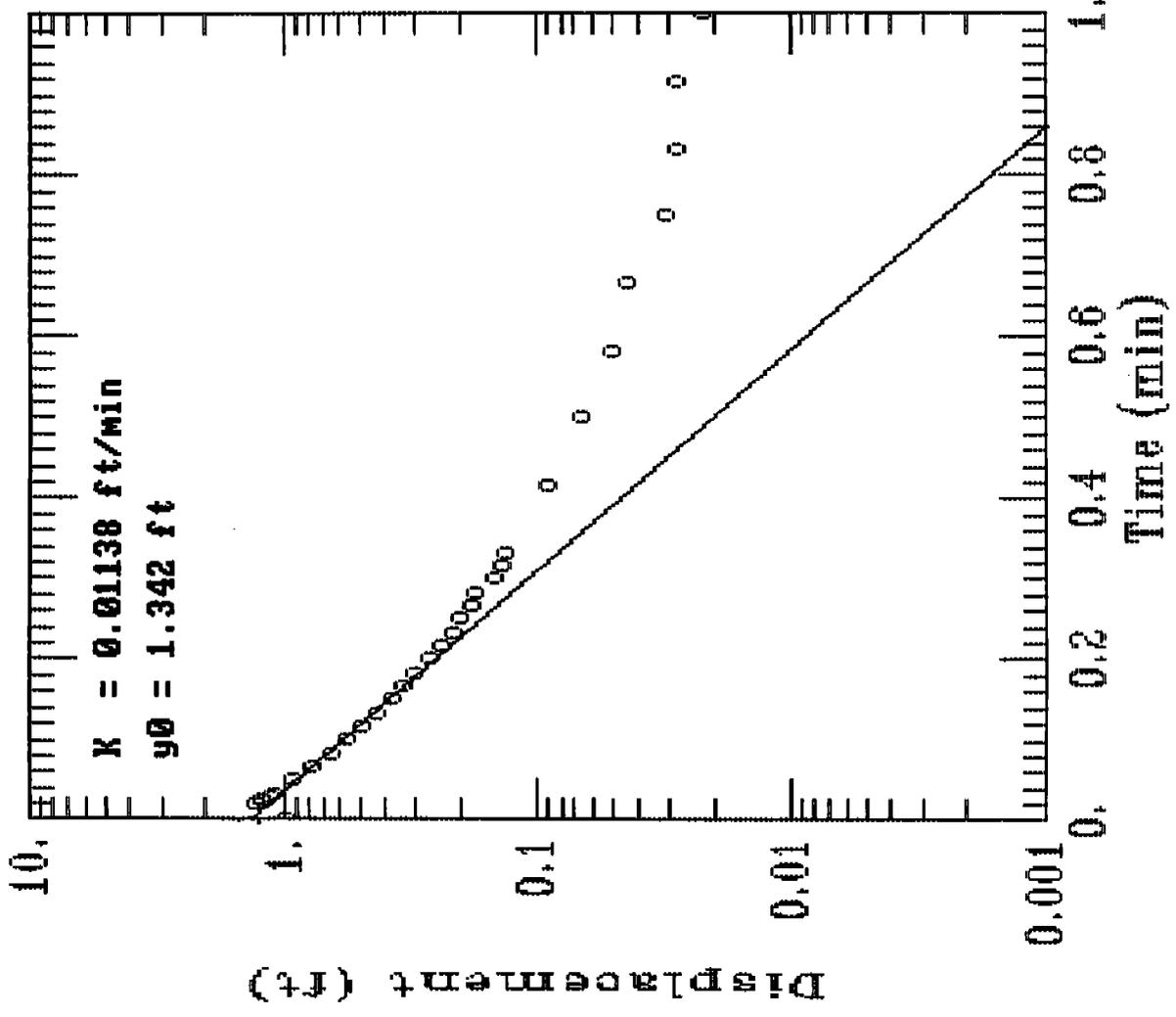
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MPT-13-P-1 RUN #6

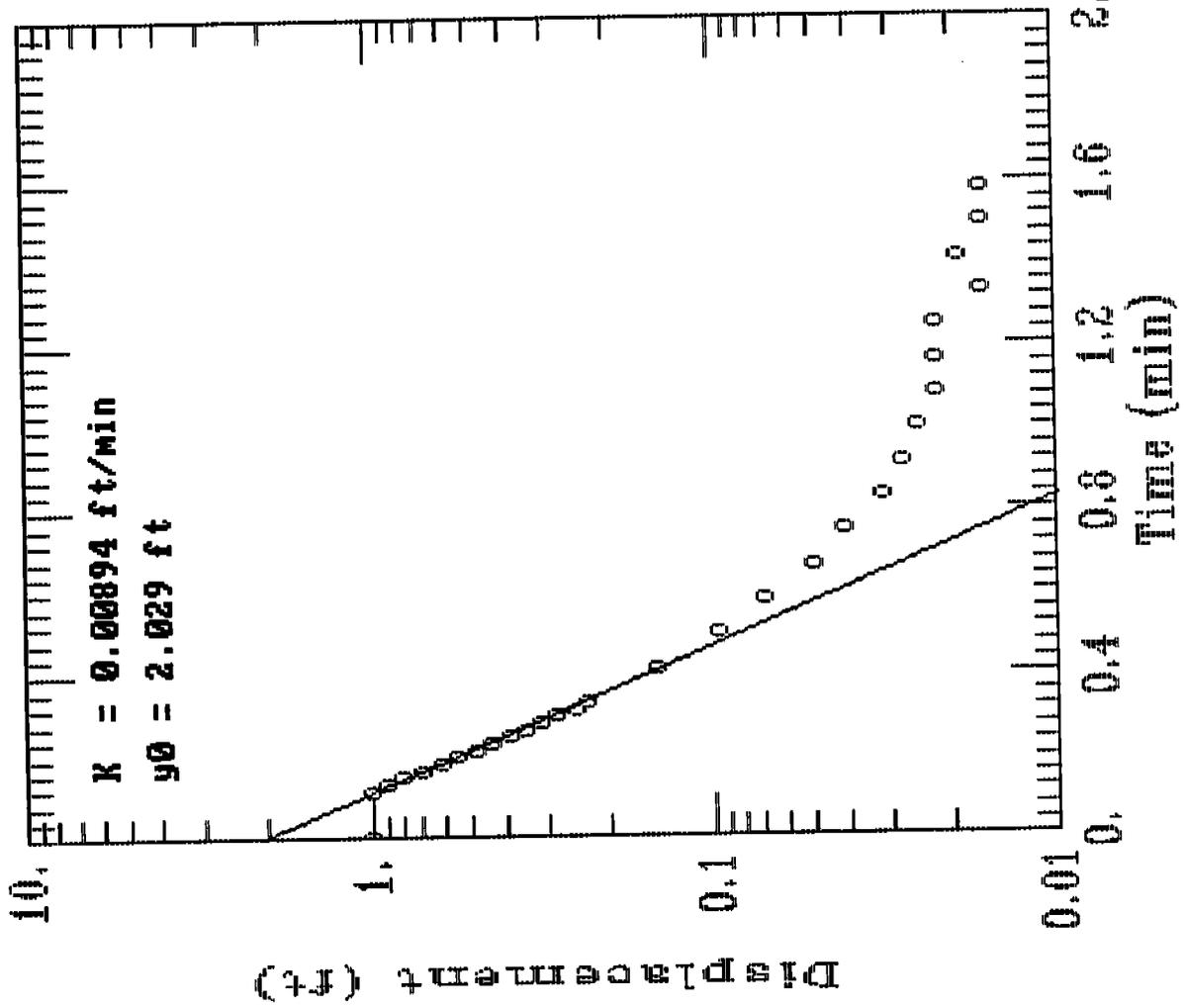


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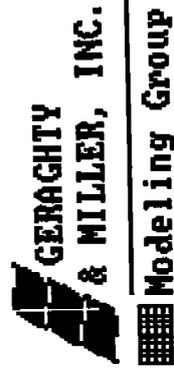
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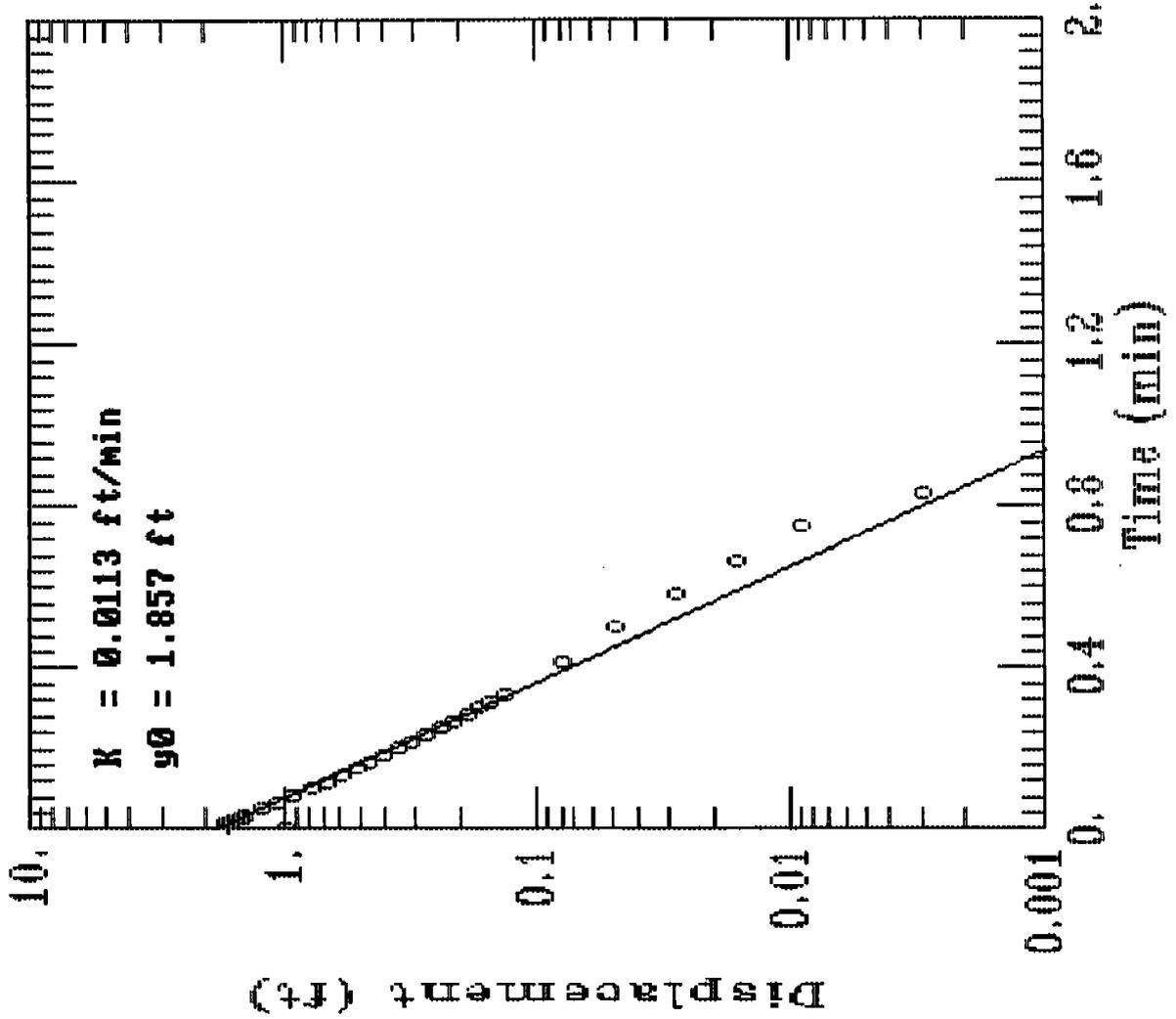


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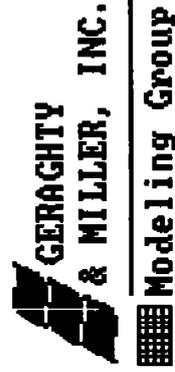


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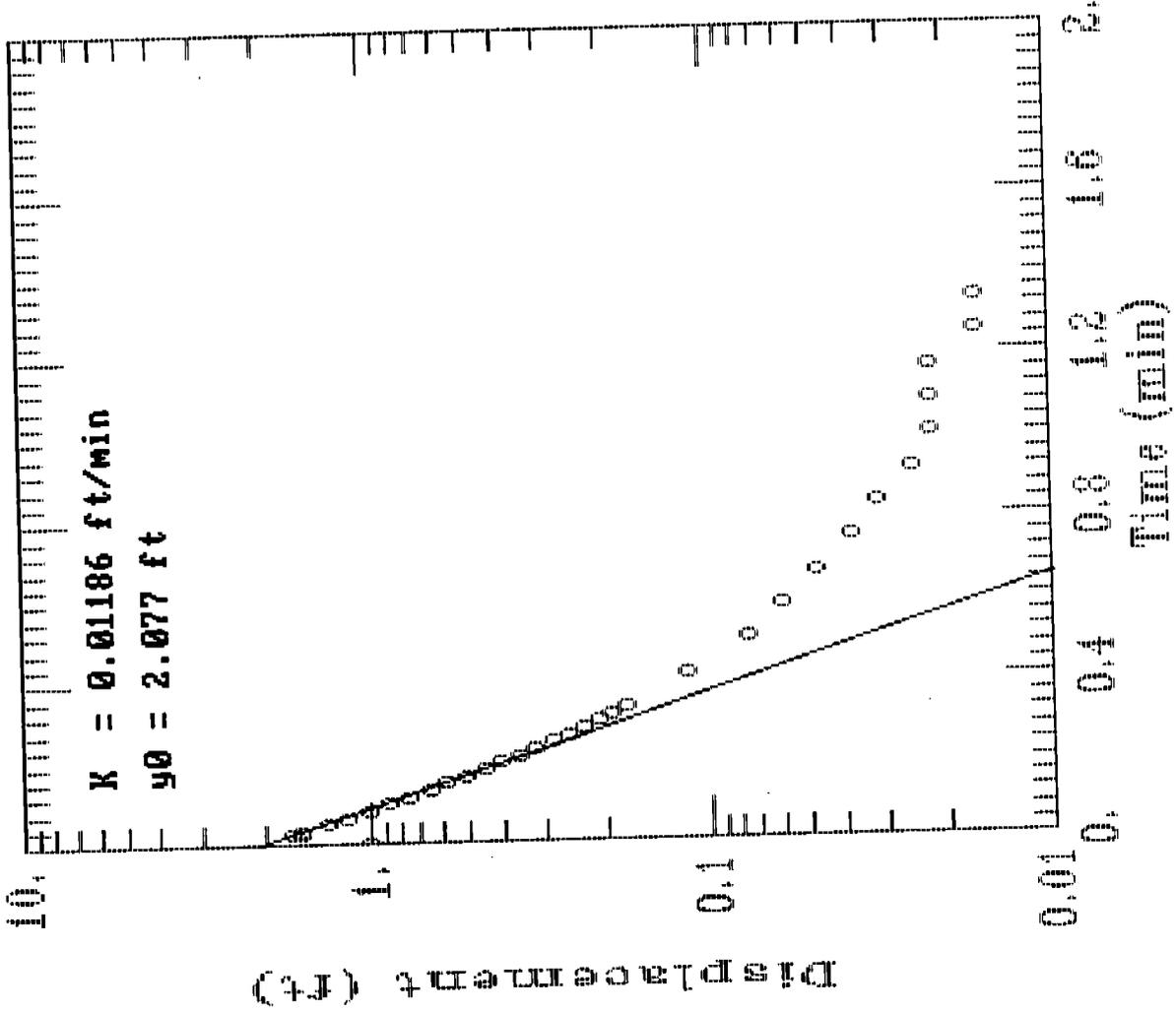
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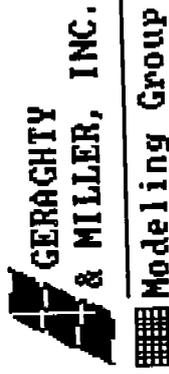
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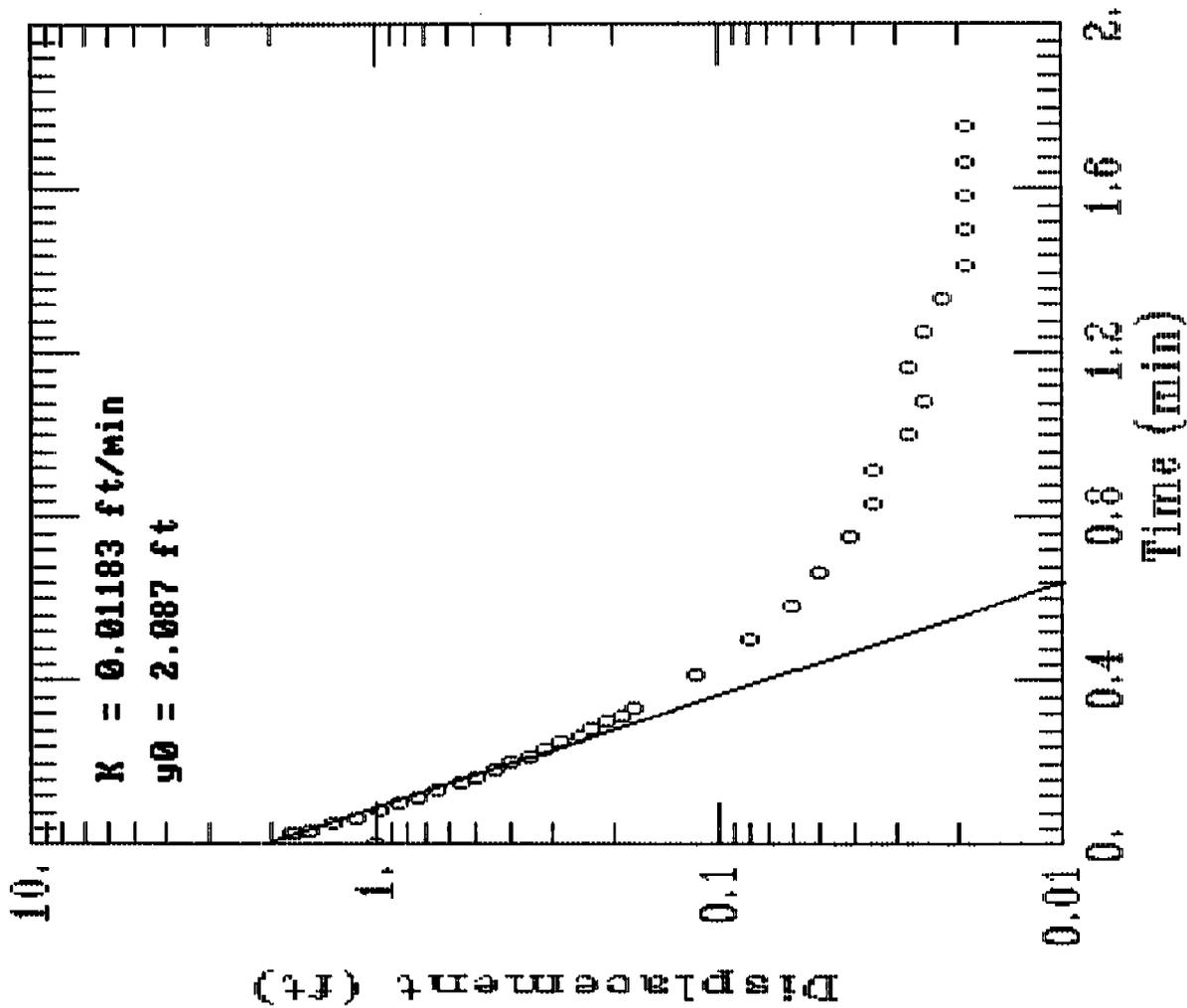
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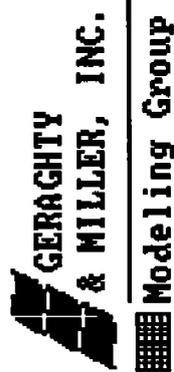
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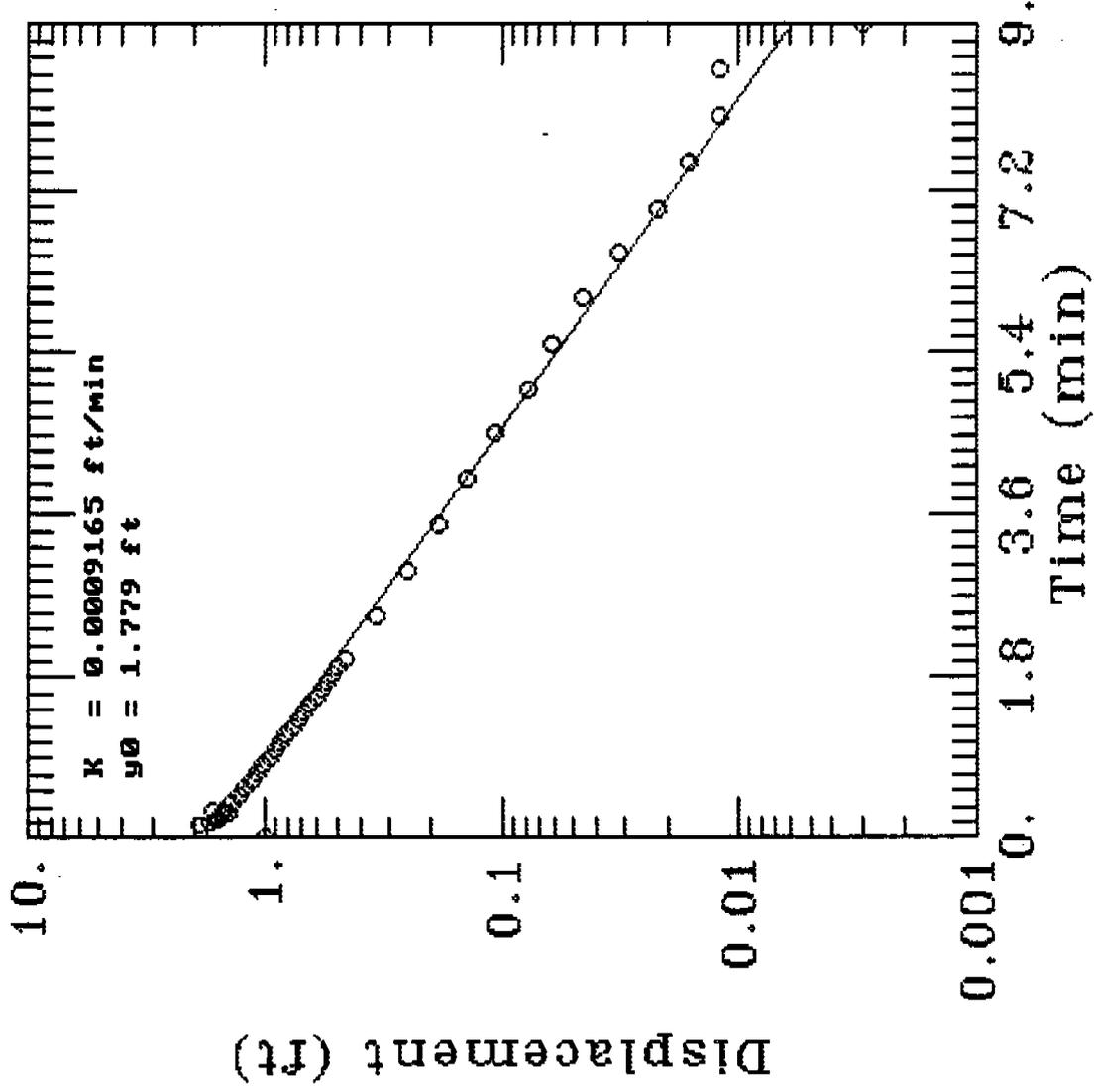
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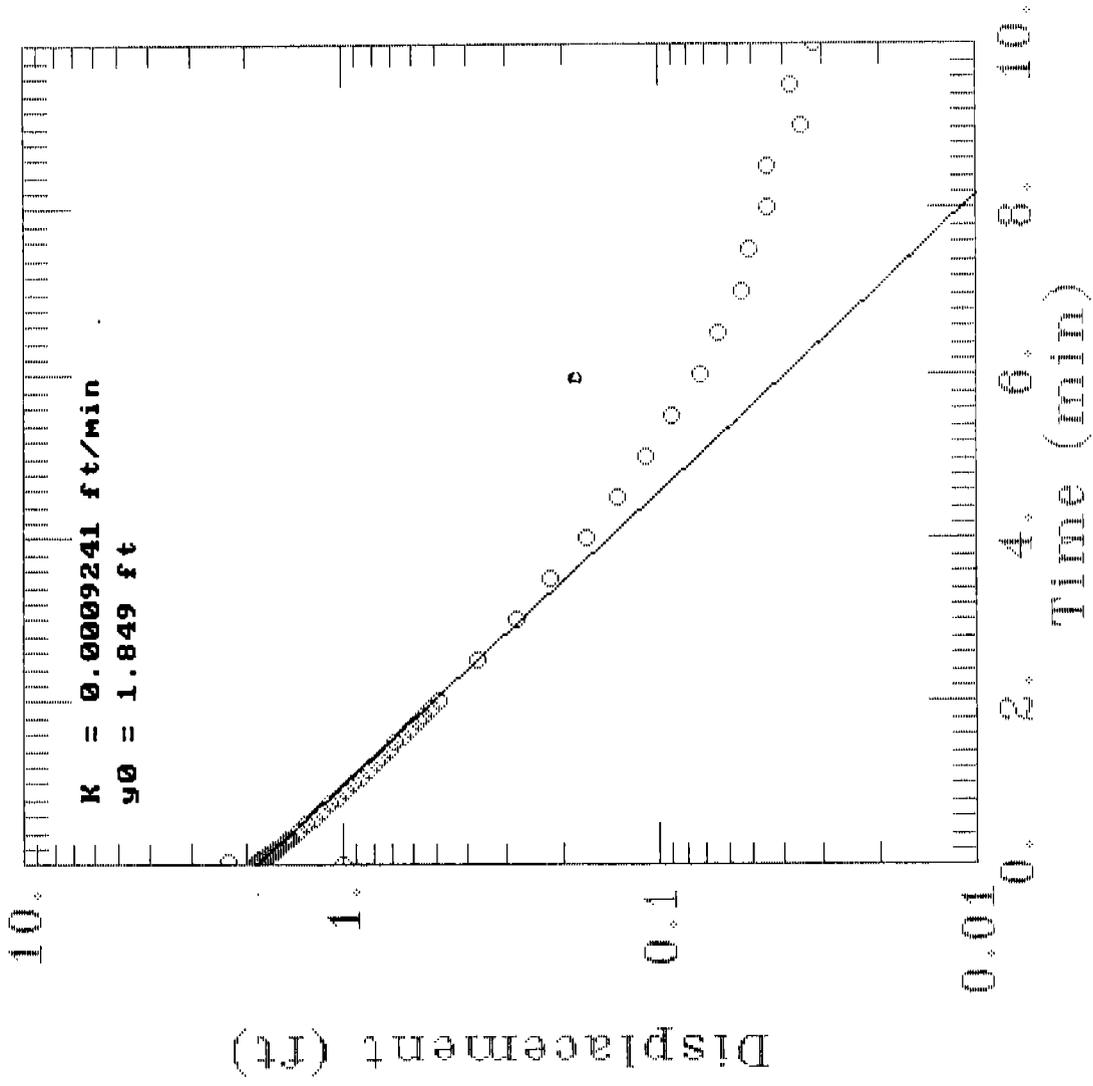
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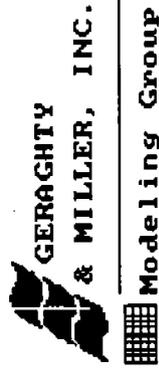
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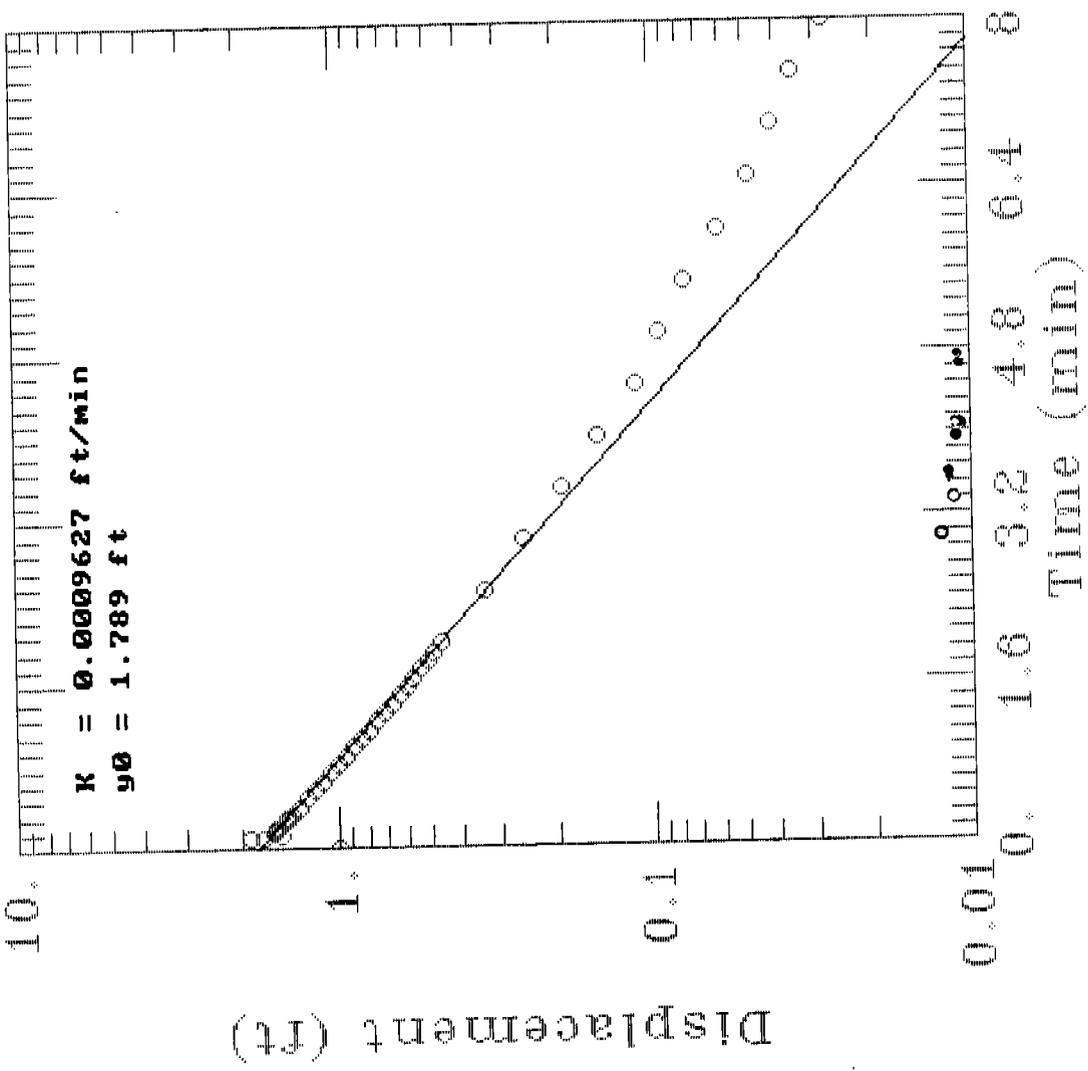
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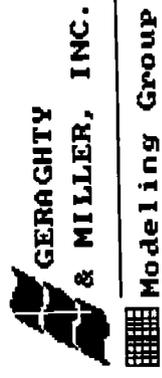
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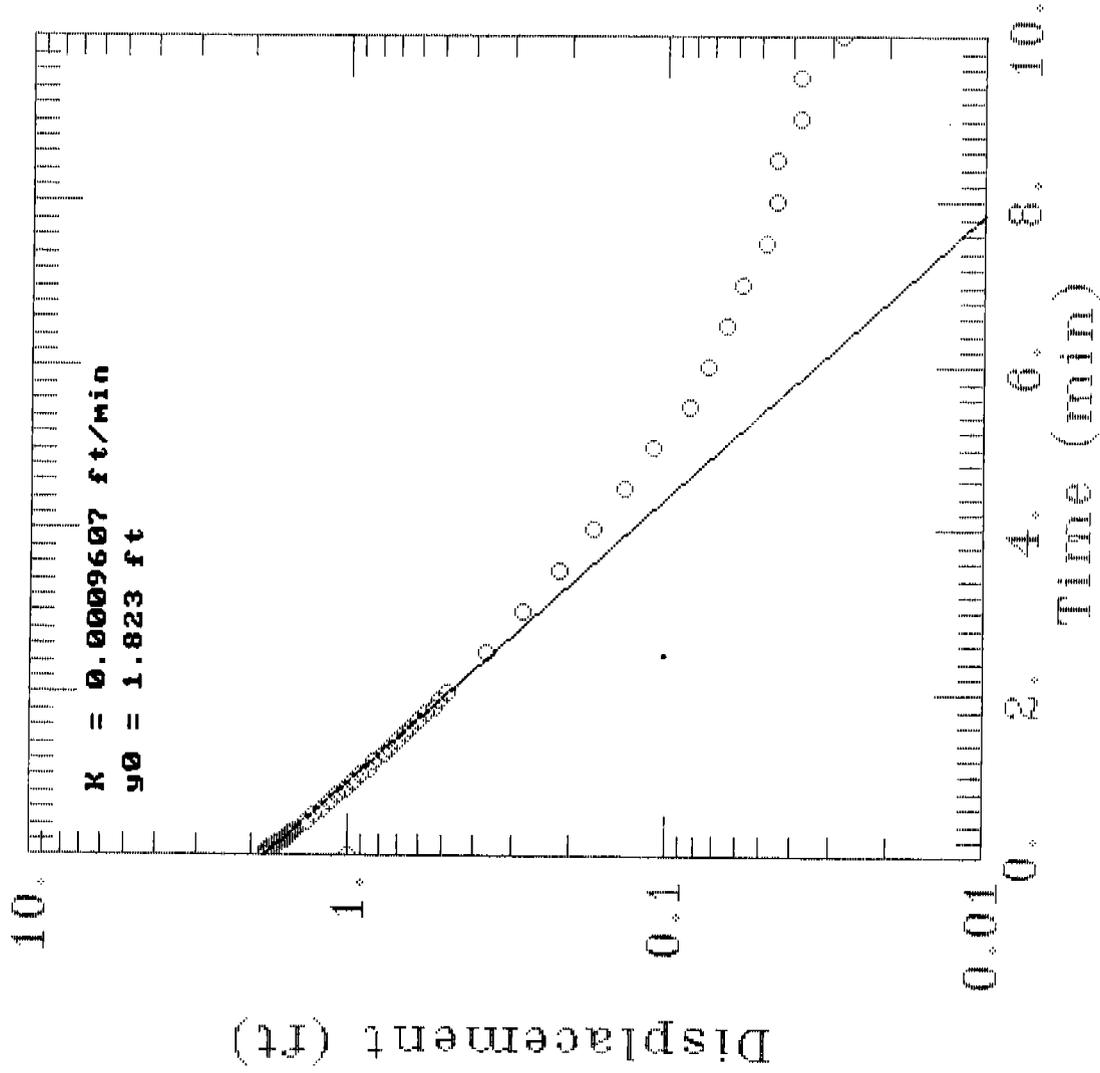
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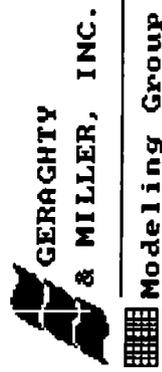
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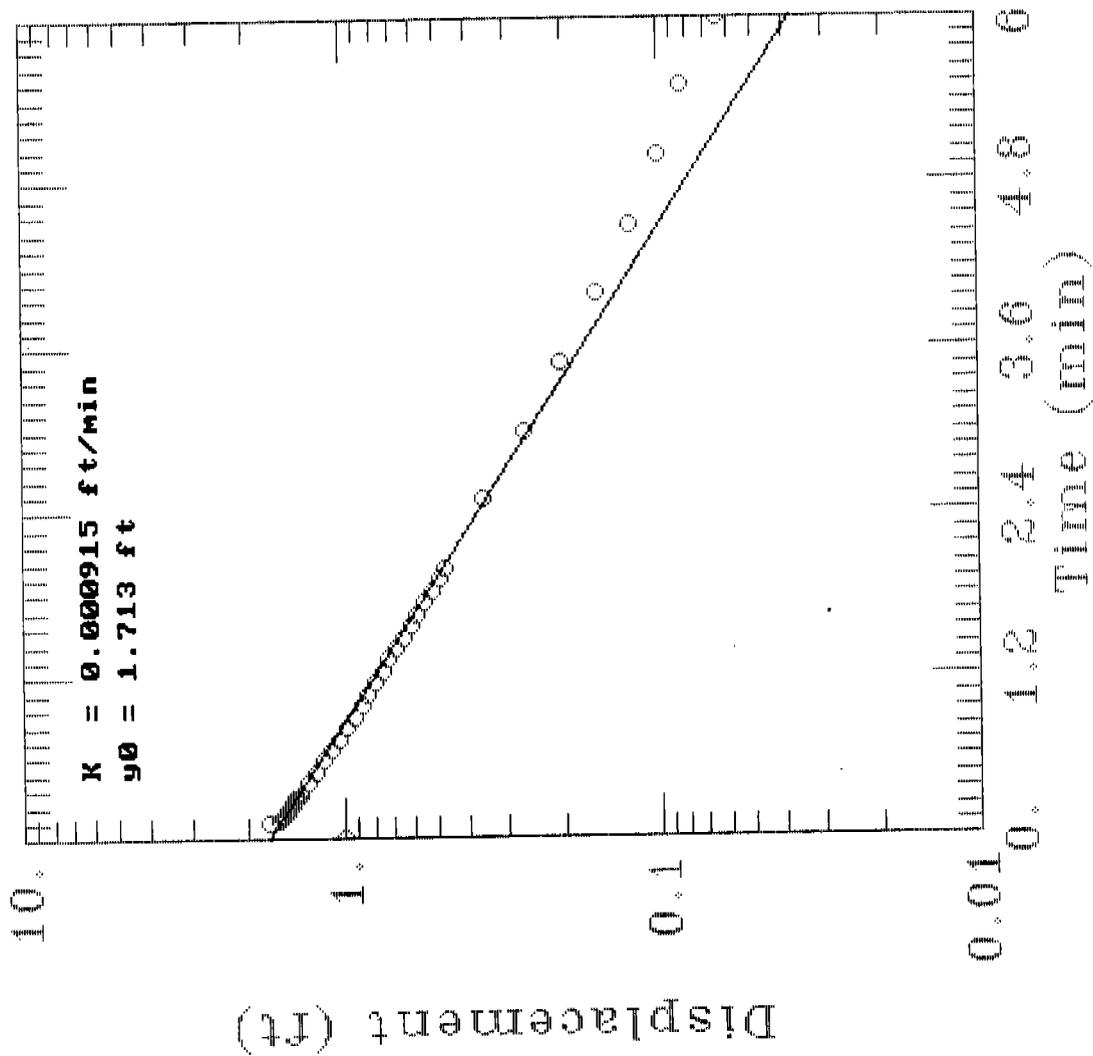
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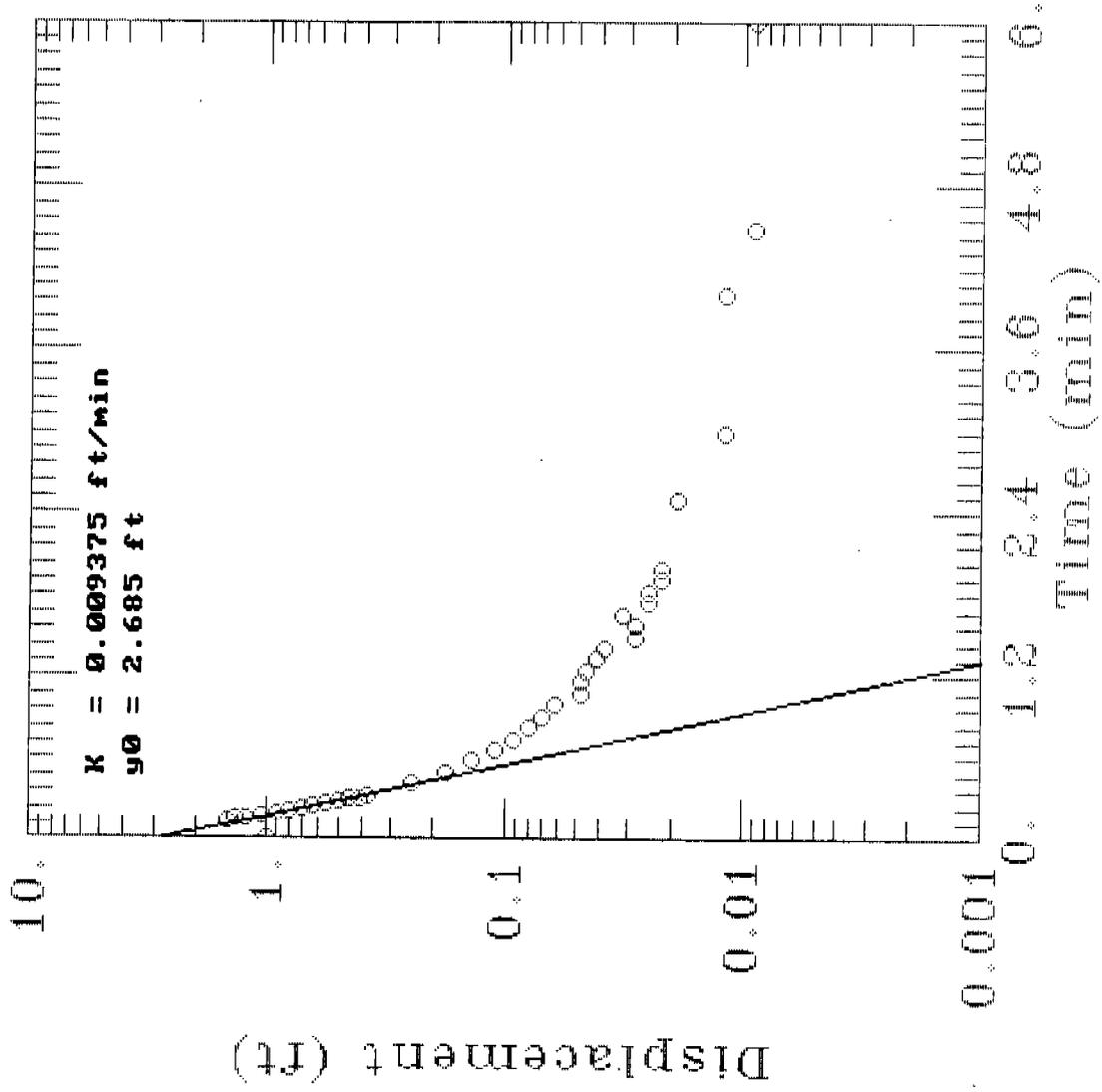


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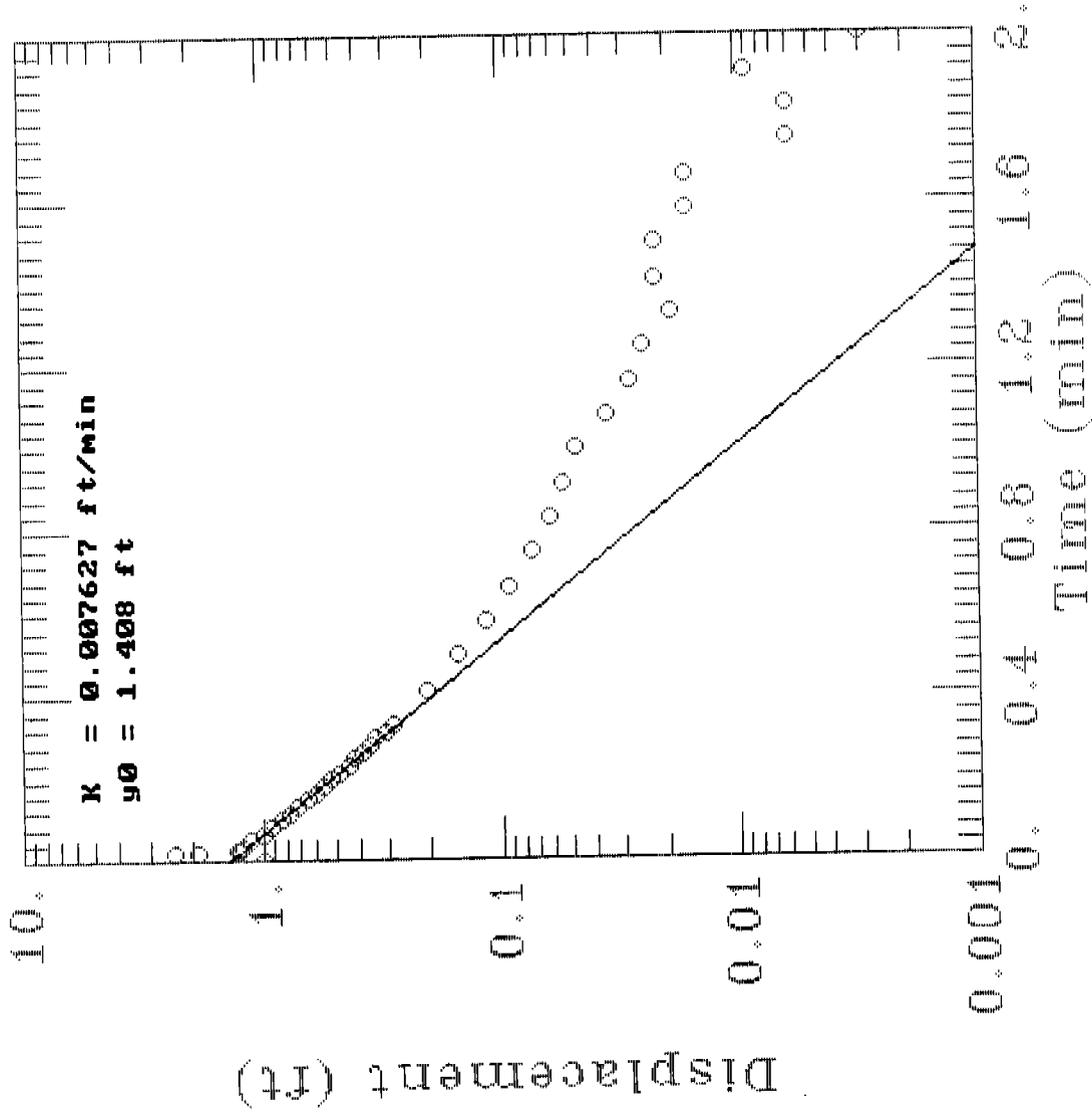


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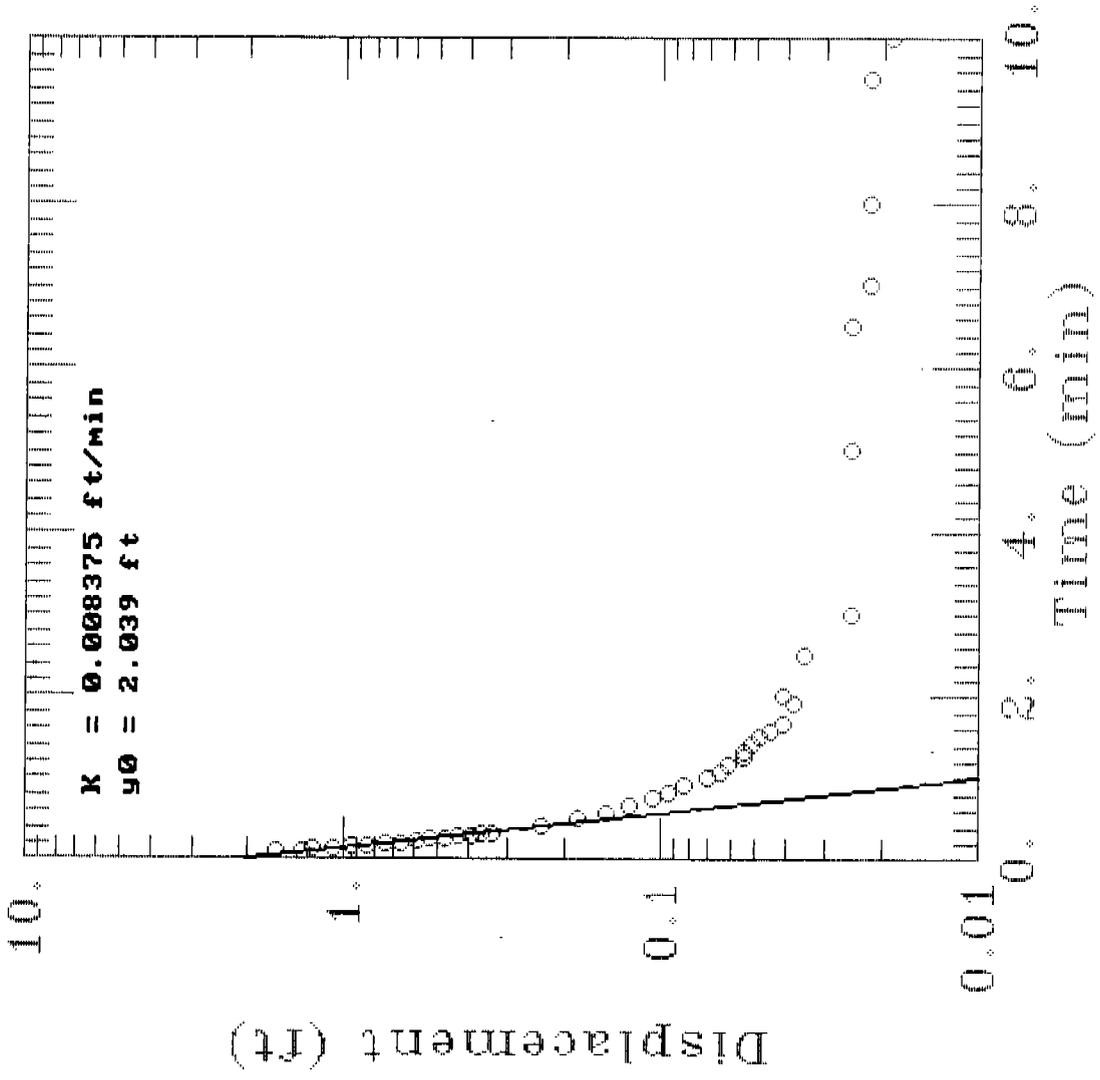


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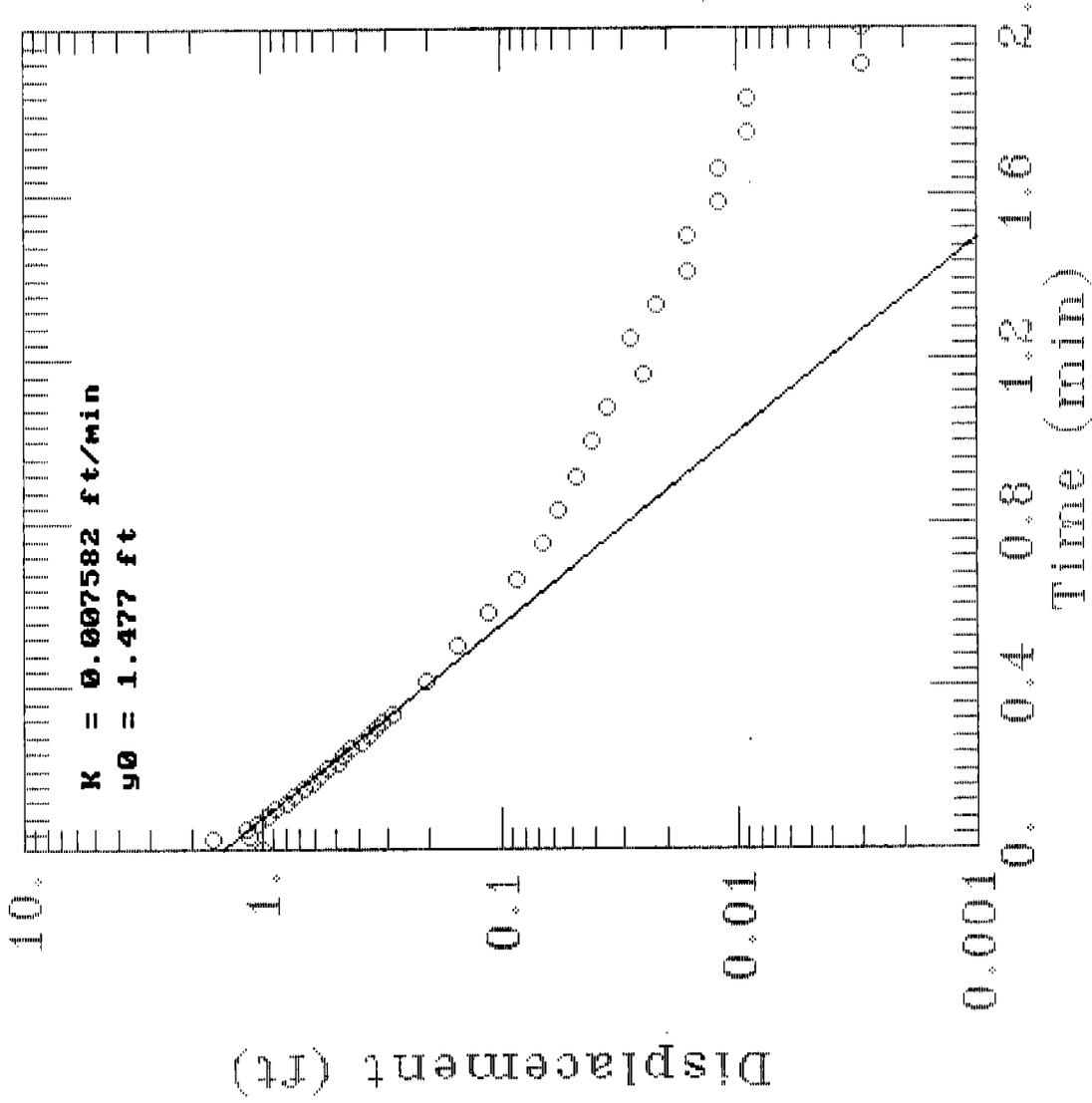
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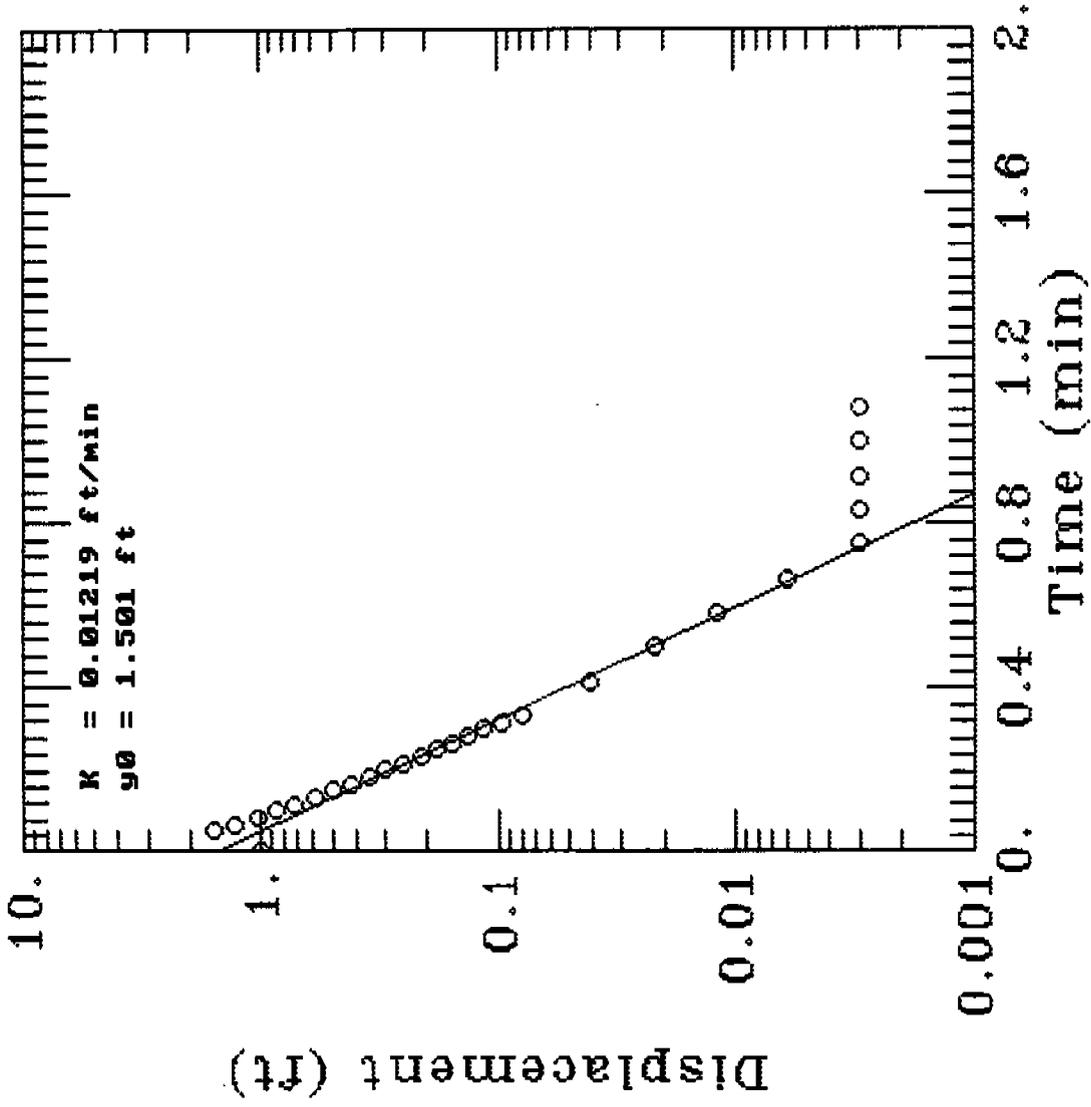


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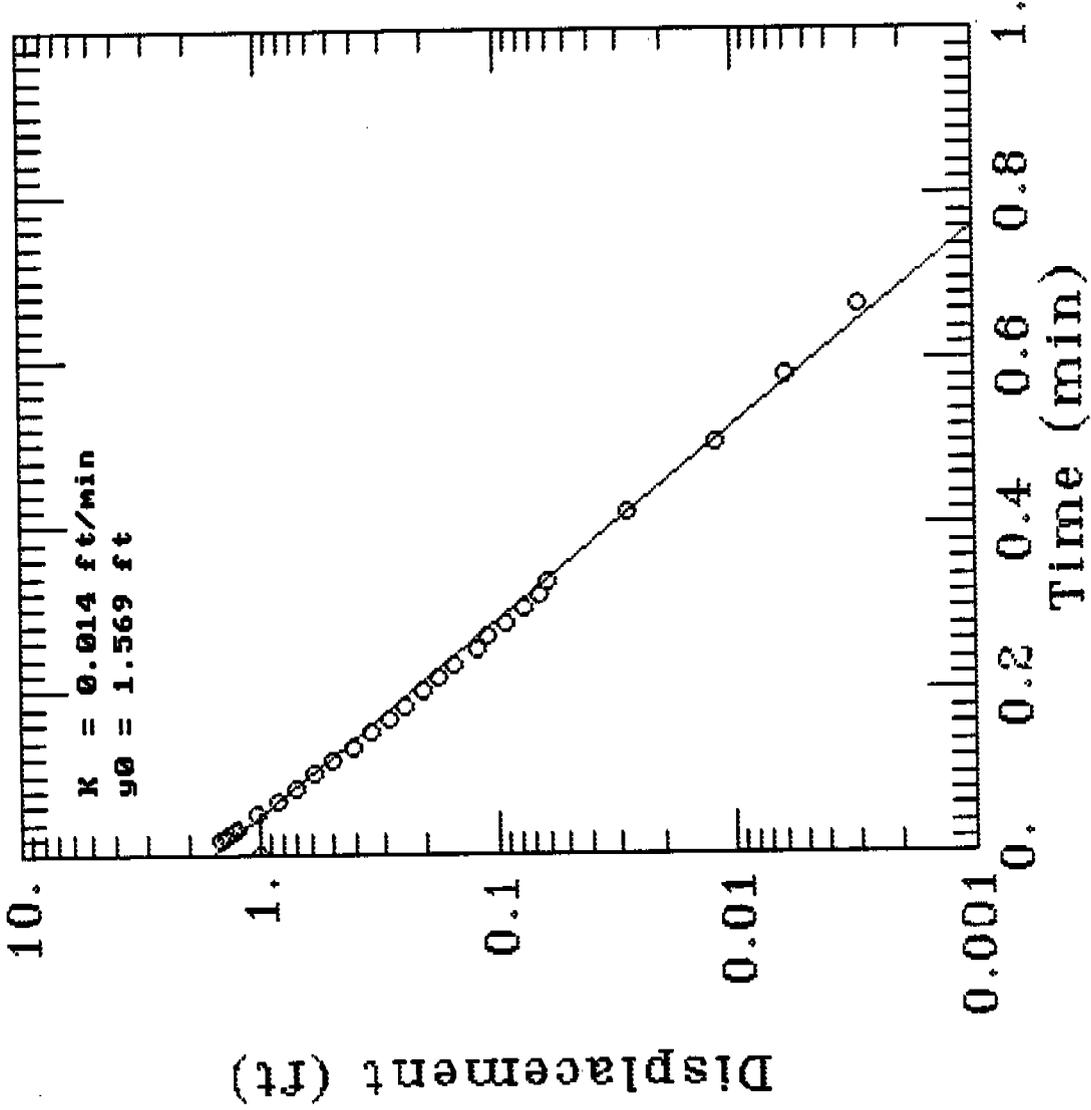


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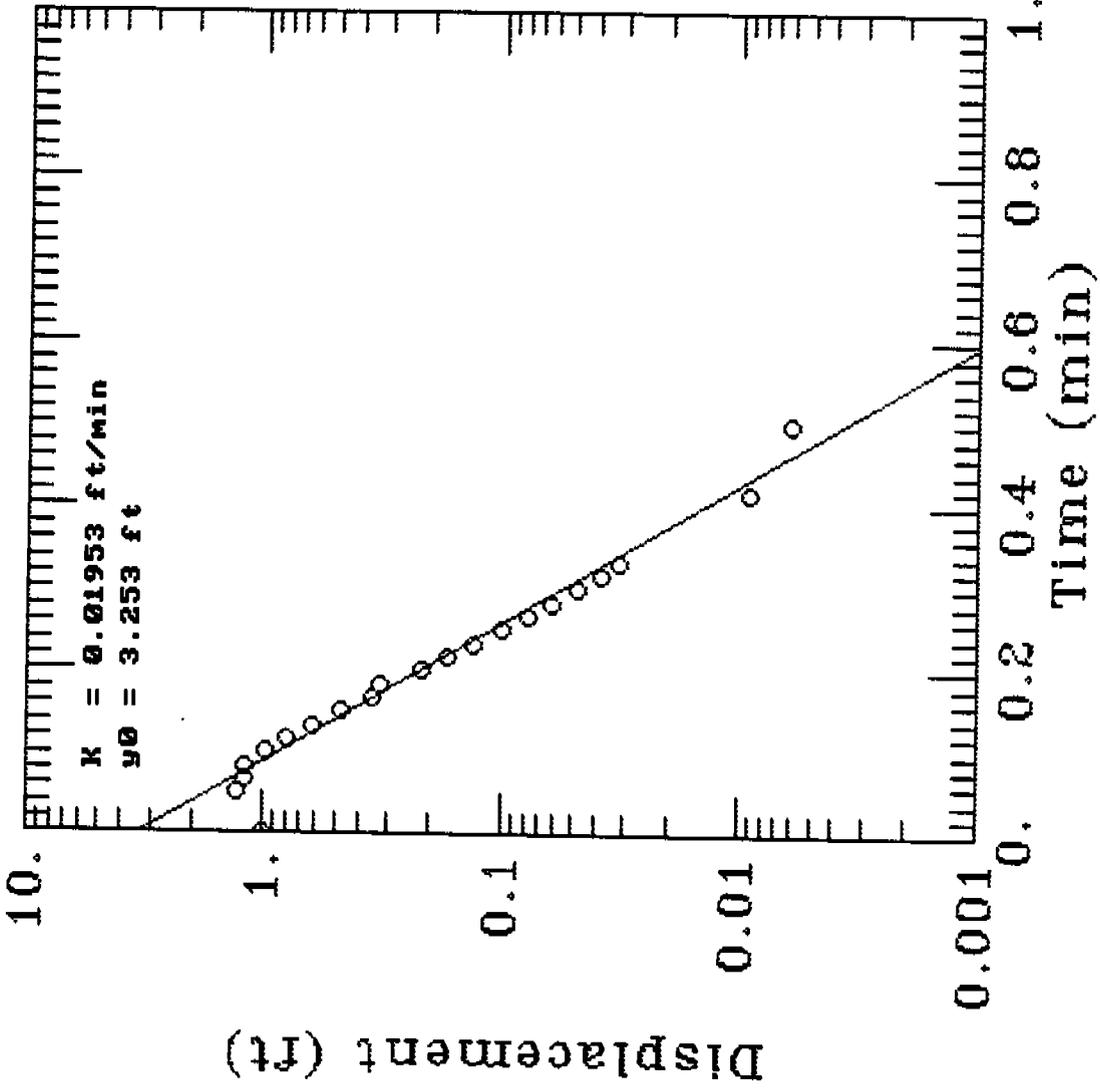


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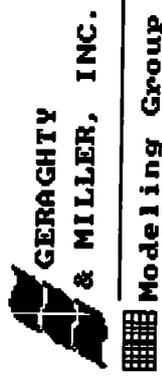
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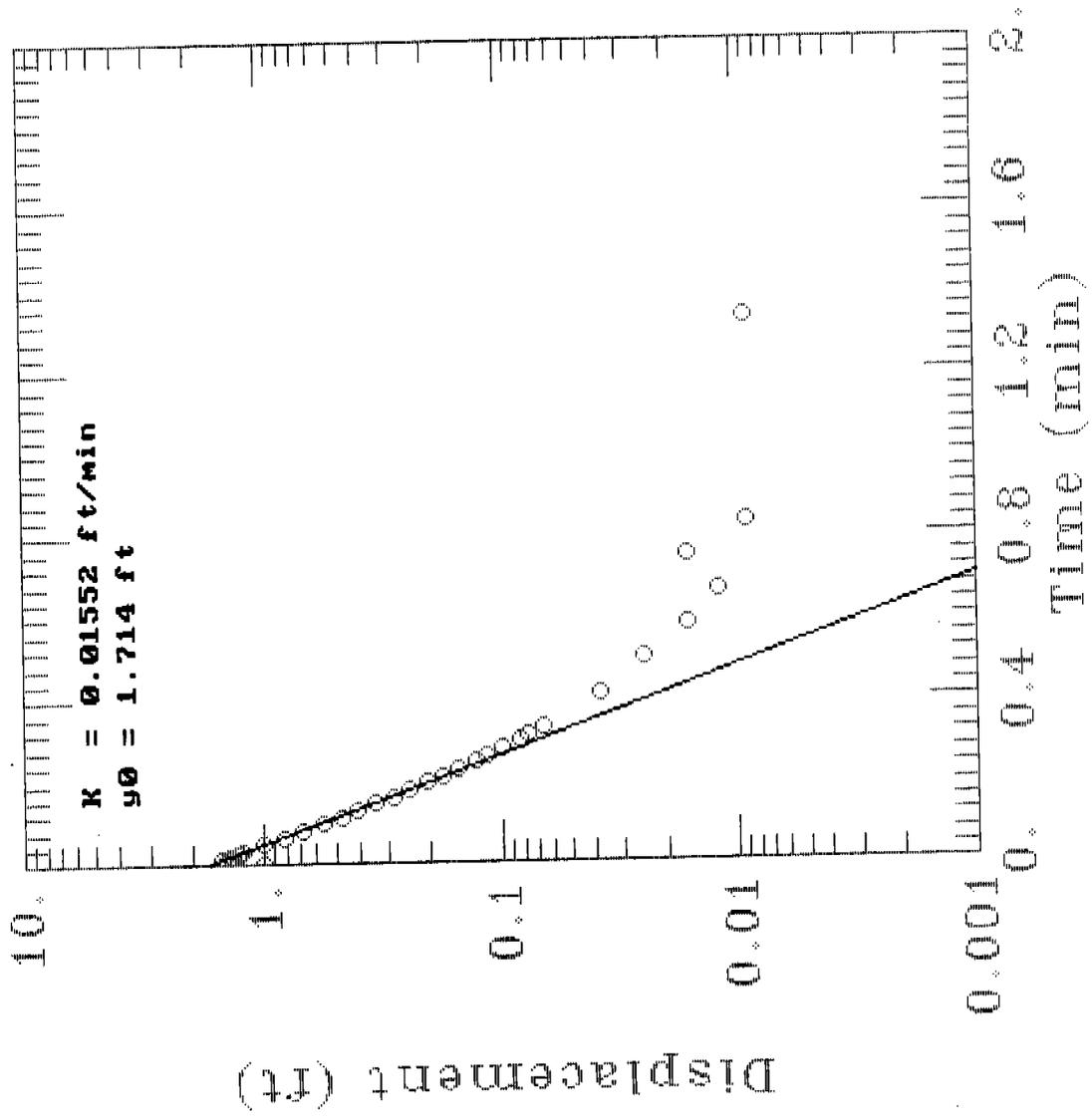
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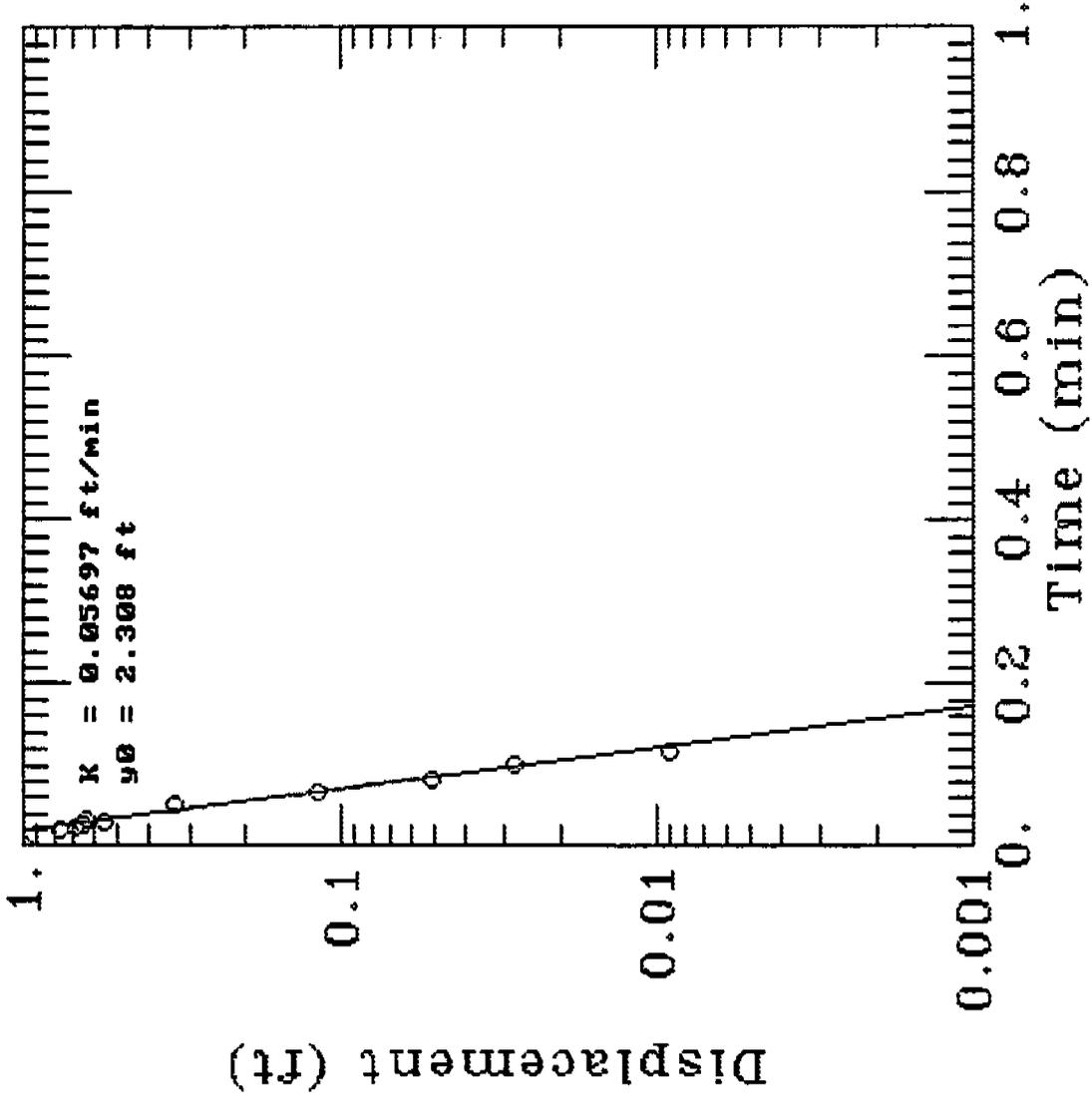


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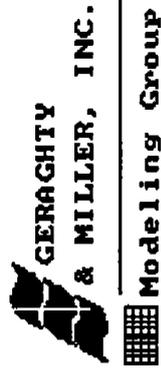


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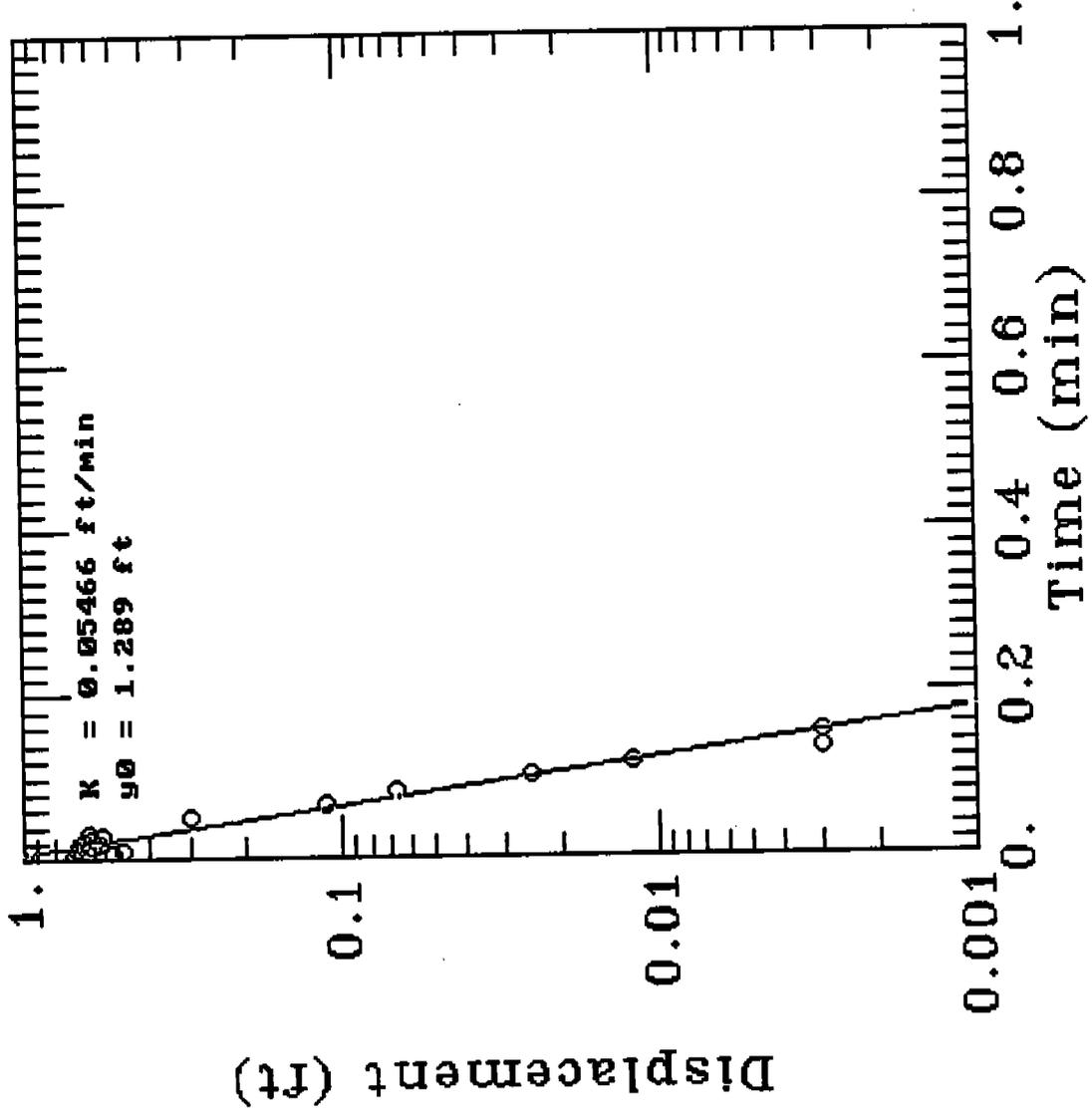
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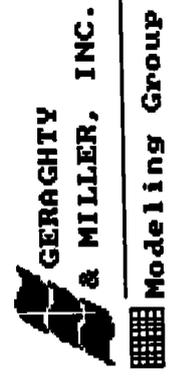
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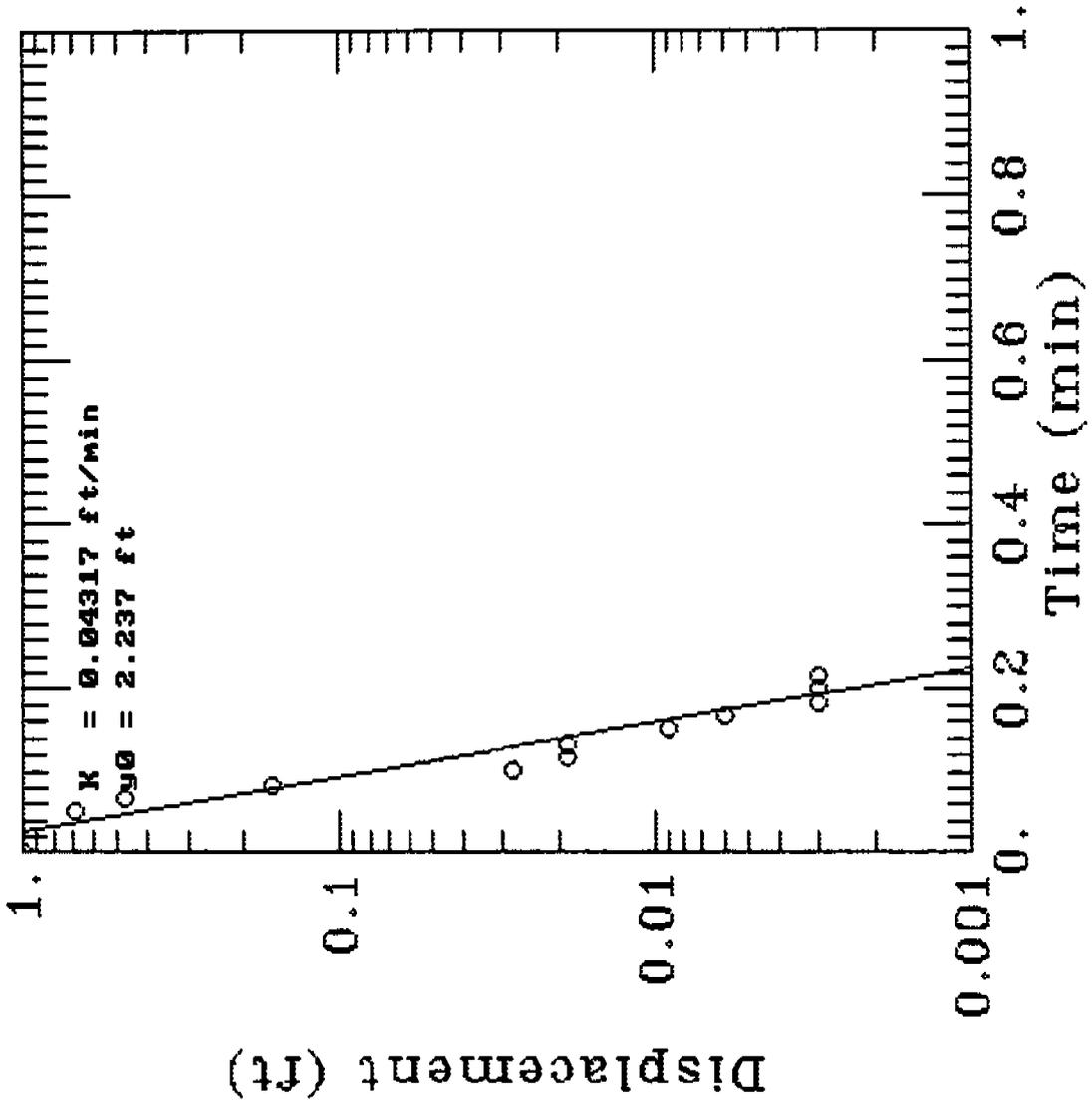
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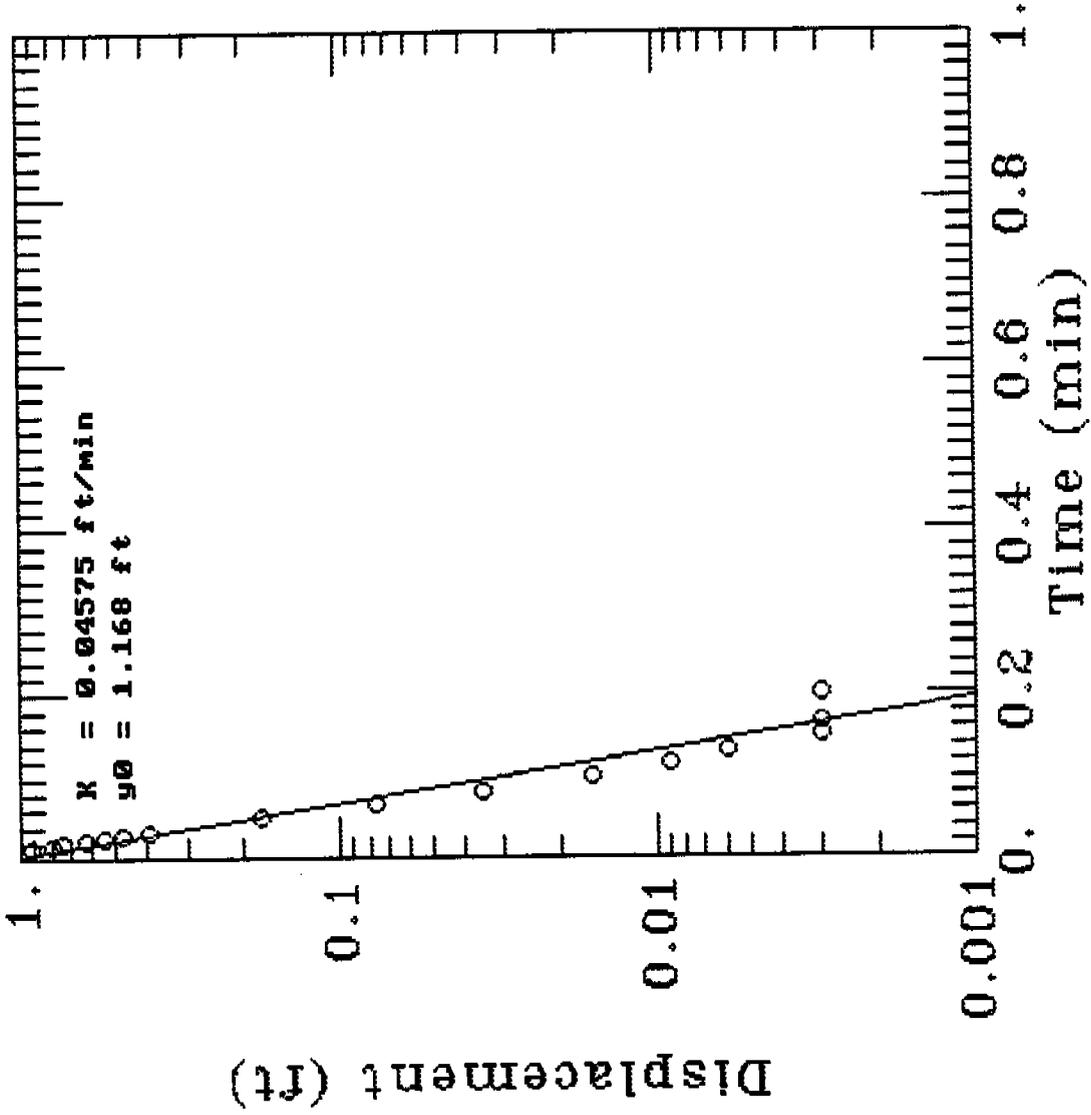


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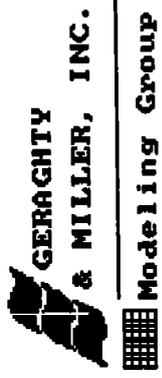


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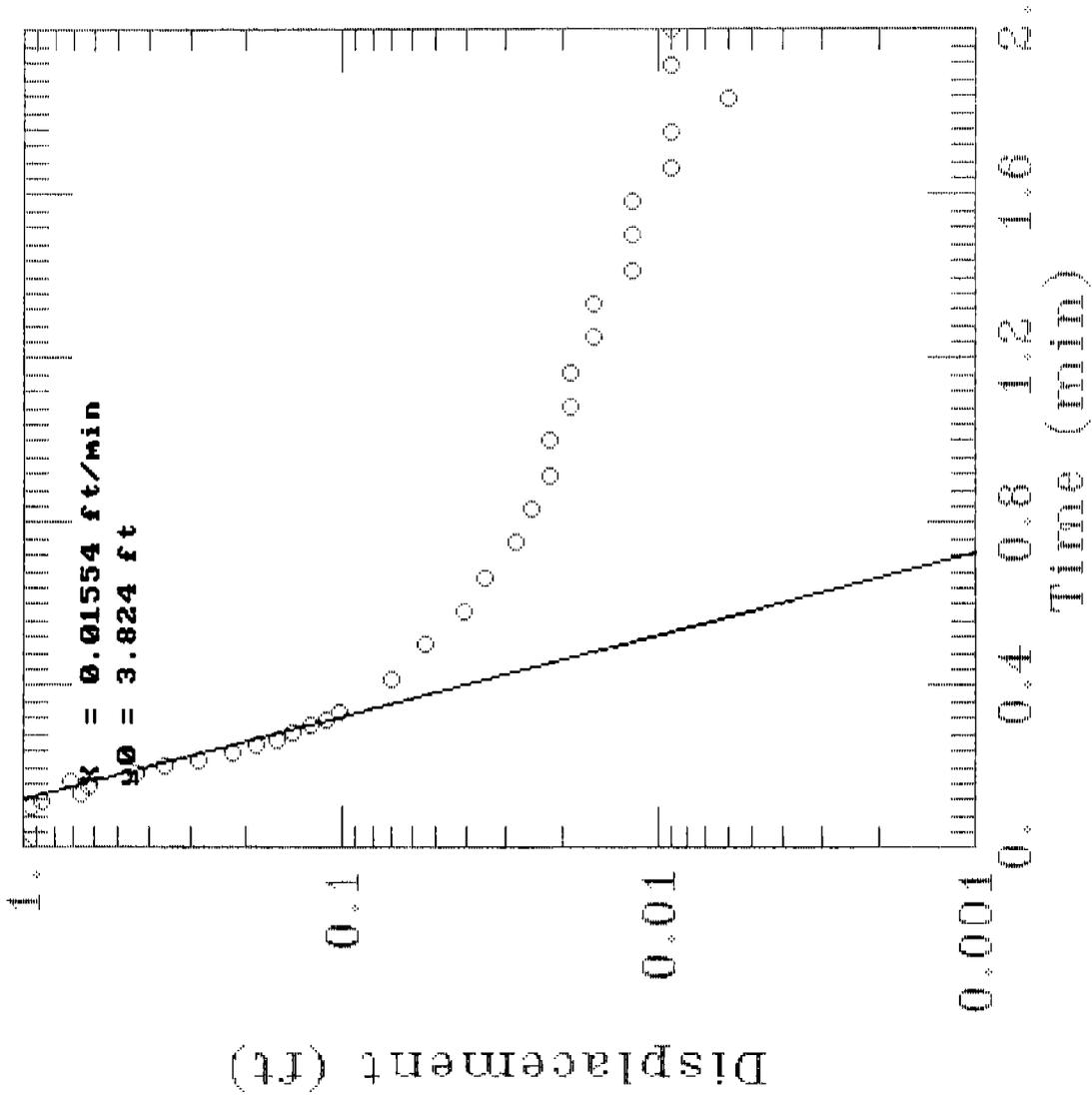
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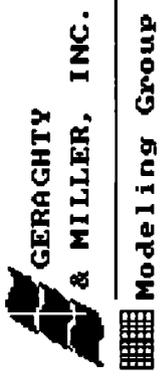
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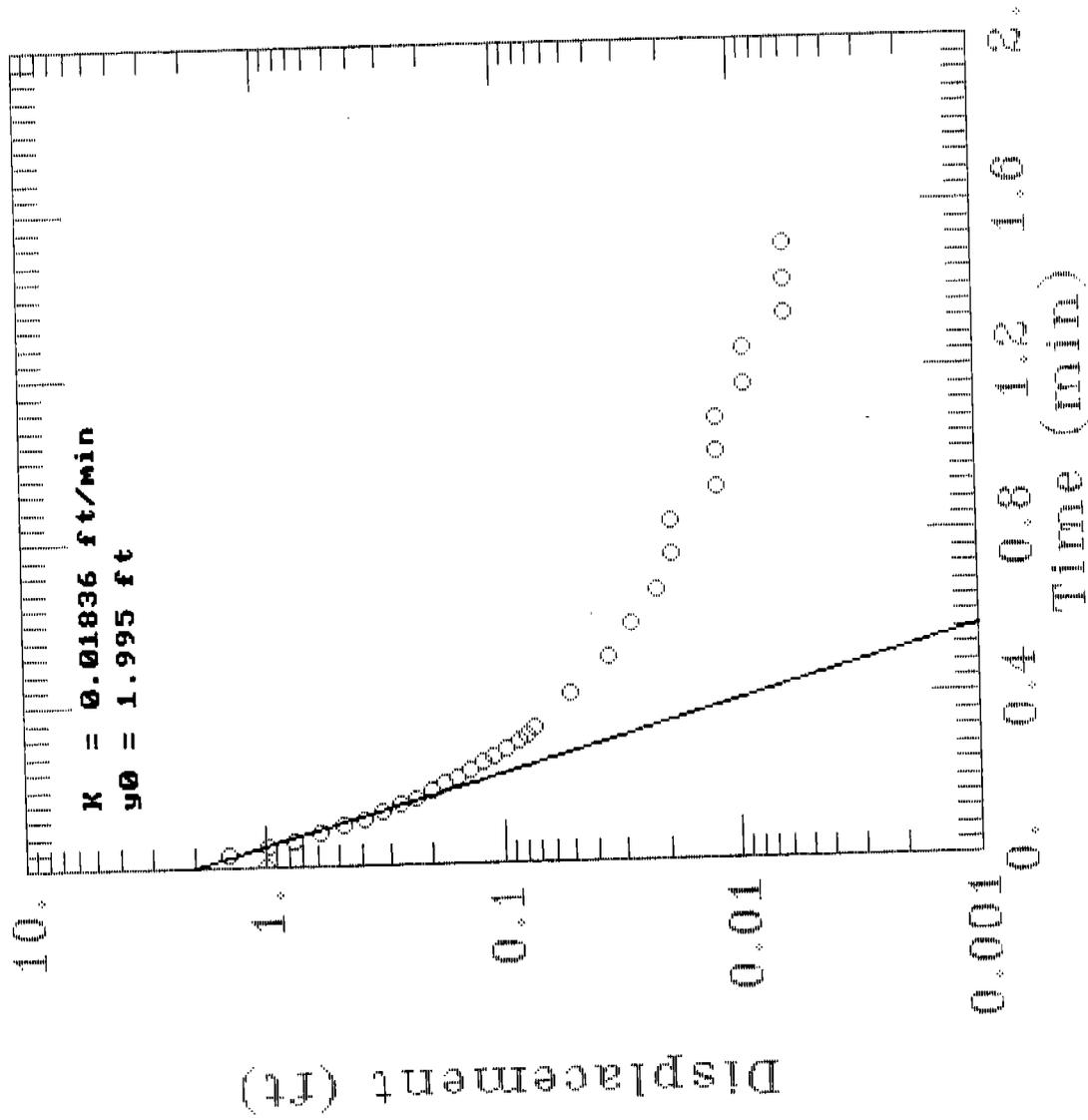
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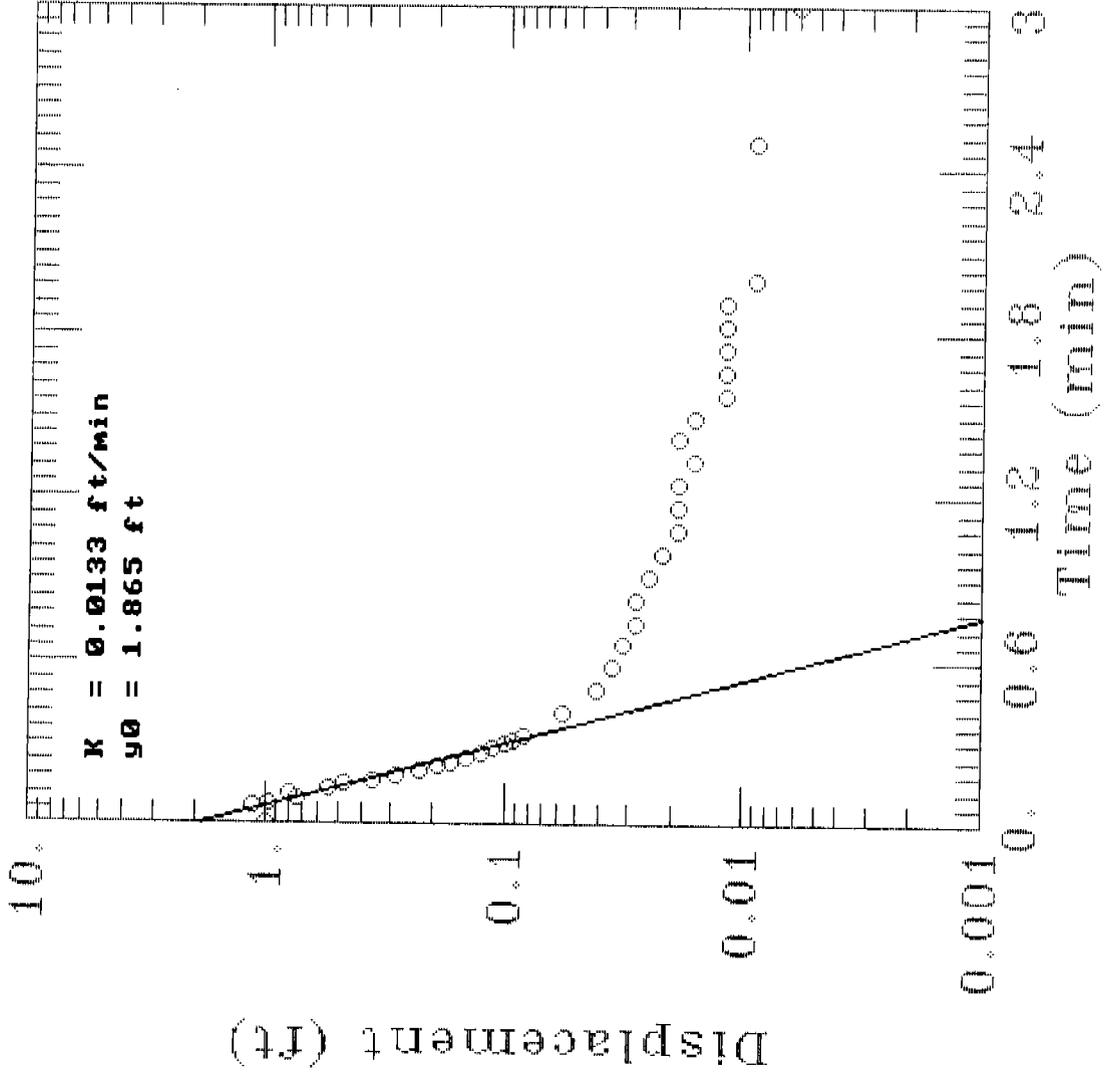


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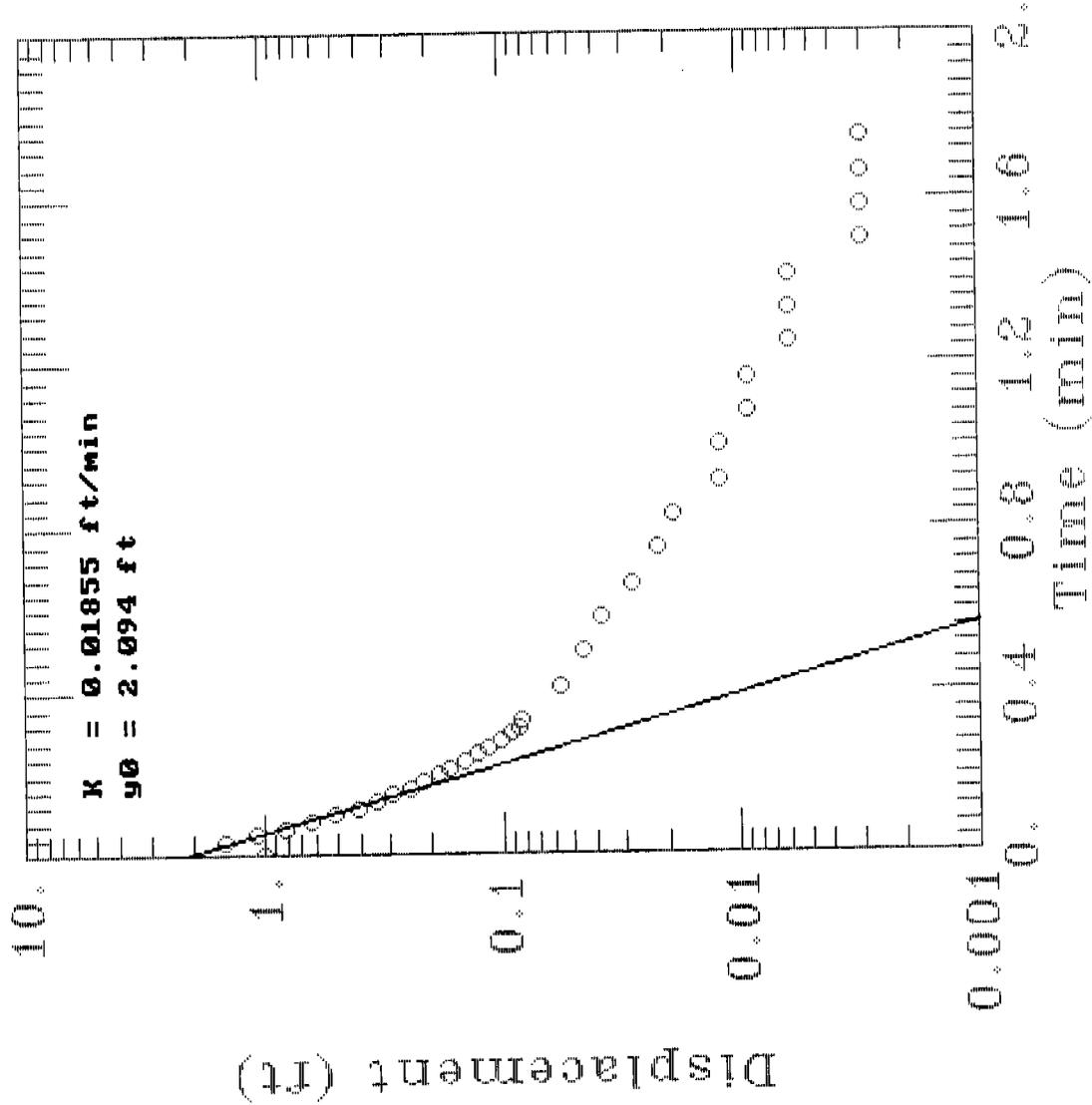
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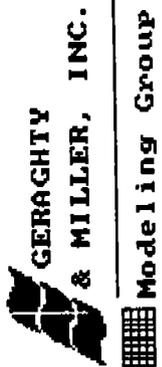


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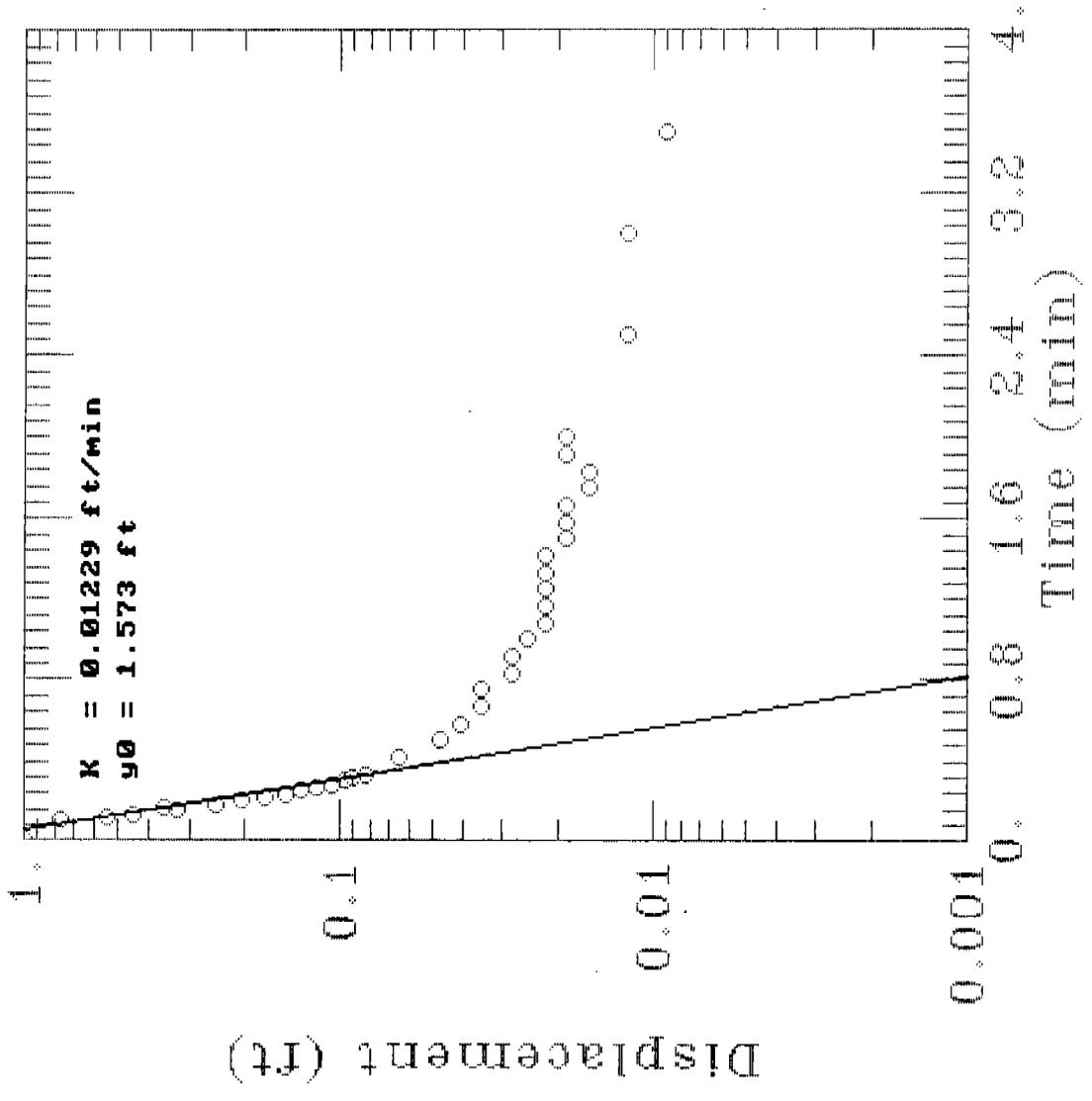
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MAYPORT NAVAL STATION MPT-17-P2 S4

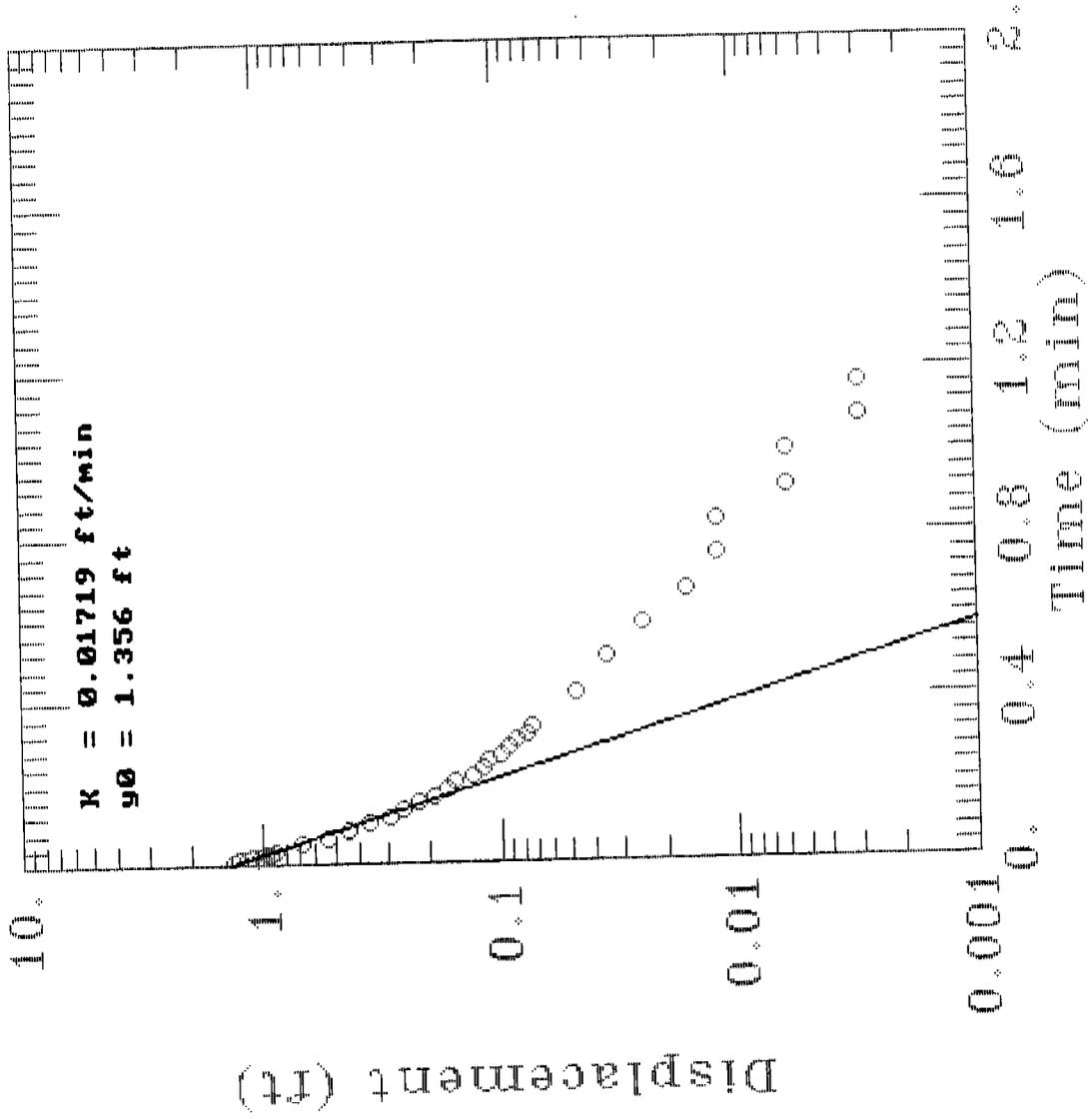


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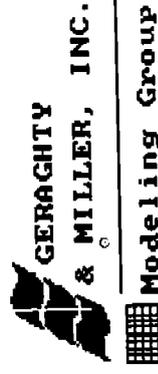


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MAYPORT NAVAL STATION MPT-17-P2 S5



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**Table B-1
Summary of Water Level Survey Data**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Well/Location	Easting State Plan	Northing State Plan	Z Elev. (MSL)	Synoptic Water Level 02/16/92			Synoptic Water Level 03/25/92			Synoptic Water Level 04/20/92		
				Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)
MPT-1-2	372520.267	2202618.261	16.89	NM	NM	NM	NM	NM	NM	02:55 pm	12.09	4.80
MPT-2-2	368573.739	2199855.356	7.56	02:22 pm	3.45	4.11	01:59 pm	3.47	4.09	06:40 pm	3.61	3.95
MPT-2-8	365492.524	2199779.885	9.43	NM	NM	NM	02:06 pm	2.9	6.53	04:30 pm	4.46	4.97
MPT-2-MW-12D	368319.800	2198211.851	5.42	01:20 pm	3.50	1.92	03:24 pm	3.15	2.27	05:27 pm	3.07	2.35
MPT-2-MW-12S	368318.326	2198209.618	5.51	01:25 pm	3.80	1.71	03:24 pm	3.19	2.32	05:25 pm	3.25	2.26
MPT-2-MW-17D	365773.232	2197411.958	7.79	01:32 am	4.10	3.69	03:36 pm	3.66	4.13	04:55 pm	3.71	4.08
MPT-2-MW-17S	365775.389	2197409.629	7.73	01:35 am	3.46	4.27	03:36 pm	3.51	4.22	04:58 pm	3.65	4.08
MPT-2-P2	365498.303	2198464.046	7.97	01:37 am	2.82	5.15	03:51 pm	2.81	5.16	04:50 pm	2.88	5.09
MPT-2-P4	364241.389	2198966.849	32.74	12:55 pm	27.68	5.06	03:30 pm	26.8	5.94	05:44 pm	26.67	6.07
MPT-2-P13	367408.890	2199402.723	11.87	NM	NM	NM	NM	NM	NM	04:15 pm	2.49	9.38
MPT-8-2	366261.822	2204968.168	13.93	NM	NM	NM	NM	NM	NM	FP	FP	NM
MPT-8-3	366363.387	2205069.447	13.72	NM	NM	NM	NM	NM	NM	FP	FP	NM
MPT-9-P1	367695.521	2205413.578	12.22	NM	NM	NM	02:35 pm	10.75	1.47	01:44 pm	10.66	1.56
MPT-11-MW-1	369851.230	2205130.879	12.16	NM	NM	NM	12:40 pm	10.94	1.22	01:36 pm	10.63	1.53
MPT-11-MW-3	369802.751	2205342.926	9.97	NM	NM	NM	12:25 pm	8.77	1.20	01:31 pm	8.45	1.52
MPT-13-1	368004.036	2202051.504	13.06	NM	NM	NM	04:25 pm	7.4	5.66	03:51 pm	2.8	10.26
MPT-13-MW-6	367684.002	2201904.440	9.66	NM	NM	NM	04:35 pm	2.8	6.86	03:17 pm	2.83	6.83
MPT-13-P5	367115.325	2200912.227	6.45	NM	NM	NM	02:17 pm	2.46	3.99	06:30 pm	2.78	3.67
MPT-13-P6	366879.480	2202120.087	10.16	NM	NM	NM	04:40 pm	1.82	8.34	03:45 pm	2.83	7.33
MPT-14-2	374680.537	2203726.012	8.64	NM	NM	NM	12:29 pm	5.52	3.12	02:05 pm	6.37	2.27
MPT-15-P3	NM	NM	10.19	NM	NM	NM	NM	NM	NM	NM	NM	NM
MPT-22-MW-1	366582.711	2200638.399	6.93	02:03 am	2.12	4.81	12:24 pm	2.31	4.62	02:03 am	NM	NM
S-4	364658.446	2199526.503	9.61	NM	NM	NM	03:35 pm	6.67	2.94	0.753472	6.44	3.17
MPT-2-3	364604.886	2199038.697	17.20	NM	NM	NM	03:25 pm	9.15	8.05	05:48 pm	9.01	8.19
MPT-14-P2	375562.214	2204016.180	5.71	11:56 am	3.74	1.97	12:20 pm	3.97	1.74	01:50 pm	3.72	1.99
MPT-14-1	374860.123	2203770.865	7.56	12:02 pm	5.72	1.84	12:26 pm	5.51	2.05	02:00 pm	5.44	2.12
MPT-14-P1	374024.697	2203675.557	6.50	12:05 pm	5.71	0.79	12:34 pm	5.54	0.96	02:20 pm	4.44	2.06
MPT-1-P1	372912.043	2203345.224	7.11	12:07 pm	4.14	2.97	09:21 am	4.49	2.62	02:25 pm	4.33	2.78
MPT-1-P3	372166.046	2202846.207	11.04	12:10 pm	7.32	3.72	12:44 pm	8.62	2.42	02:30 pm	7.6	3.44

See notes at end of table.

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Table B-1 (Continued)
Summary of Water Level Survey Data

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Well/Location	Synoptic Water Level 02/16/92			Synoptic Water Level 03/25/92			Synoptic Water Level 04/20/92					
	X Easting State Plan	Y Northing State Plan	Z Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)
MPT-1-1	372828.999	2202286.898	16.96	12:13 pm	11.40	5.56	12:50 pm	11.85	5.11	02:40 pm	11.88	5.08
MPT-1-P2	373338.715	2202891.025	11.77	12:17 pm	7.63	4.14	12:10 pm	7.92	3.85	02:55 pm	8.06	3.71
MPT-17-P2	370630.280	2201113.614	7.72	12:19 pm	4.94	2.78	12:57 pm	5.03	2.69	03:05 pm	5.04	2.68
MPT-2-15-SR	367584.874	2200460.565	6.65	12:30 pm	3.45	3.20	02:09 pm	3.67	2.98	04:10 pm	3.79	2.86
MPT-2-MW-16S	365475.365	2200288.986	6.73	12:36 pm	2.86	3.87	03:01 pm	2.92	3.81	12:38 pm	NM	2.84
MPT-2-15-DR	367585.292	2200457.999	6.89	12:38 pm	3.80	3.09	02:10 pm	3.96	2.93	04:11 pm	4.05	2.84
MPT-2-MW-16D	365475.209	2200286.791	6.69	12:38 pm	3.56	3.13	02:59 pm	4.75	1.94	12:38 pm	NM	9.28
S-1	366904.007	2204505.599	14.66	12:41 pm	5.28	9.38	02:10 pm	5.55	9.11	05:00 pm	5.38	9.28
MPT-10-P1	365963.797	2204745.462	10.68	12:43 pm	8.47	2.21	02:20 pm	8.61	2.07	12:43 pm	NM	6.98
MPT-8D-P1	367186.012	2204936.811	12.89	12:44 pm	6.10	6.79	02:05 pm	6.31	6.58	04:56 pm	5.91	1.45
MPT-11-MW-2	369902.227	2205331.985	10.42	12:52 pm	9.36	1.06	12:35 pm	1.12	9.30	01:20 pm	8.97	3.15
MPT-2-MW-4R	365011.200	2199896.717	8.29	12:55 pm	5.06	3.23	03:40 pm	5.25	3.04	06:00 pm	5.14	4.54
MPT-15-P1	365689.153	2204181.740	13.28	12:57 pm	8.58	4.70	02:25 pm	9	4.28	04:45 pm	8.74	8.49
MPT-2-P12	365157.004	2196870.257	32.75	01:03 pm	23.65	9.10	02:50 pm	24.12	8.63	05:12 pm	24.26	8.49
MPT-2-P11	364395.626	2196198.862	31.85	01:07 pm	24.46	7.39	03:00 pm	25.89	5.96	05:19 pm	26.01	5.84
MPT-2-P10	363415.515	2195899.820	32.02	01:11 pm	19.75	12.27	03:05 pm	23.03	8.99	05:26 pm	23.51	8.51
MPT-2-MW-11S	368644.337	2198829.883	5.73	01:14 pm	2.40	3.33	03:17 pm	2.27	3.46	05:35 pm	3.02	2.71
MPT-2-P9	362977.876	2197566.006	32.18	01:15 pm	26.20	5.98	03:10 pm	26.43	5.75	01:15 pm	24.65	7.53
MPT-2-P8	367731.872	2197416.959	6.35	01:20 pm	3.50	2.85	03:28 pm	3.4	2.95	05:15 pm	3.35	3.00
MPT-2-P7	366597.014	2197396.923	7.95	01:25 pm	3.80	4.15	03:32 pm	3.9	4.05	05:10 pm	4	3.95
MPT-2-7S	365926.741	2197405.627	10.49	01:30 pm	6.24	4.25	03:43 pm	6.31	4.18	05:03 pm	6.44	4.05
MPT-2-7D	365934.423	2197403.643	9.70	01:38 pm	6.58	3.12	03:43 pm	6.74	2.96	05:05 pm	6.56	3.14
MPT-2-P1	365497.218	2199063.857	7.75	01:40 pm	2.91	4.84	03:56 pm	2.93	4.82	04:45 pm	2.91	4.84
MPT-2-1	365498.666	2199297.512	10.33	01:40 pm	6.10	4.23	03:11 pm	6.07	4.26	04:40 pm	6.07	4.26
MPT-2-8	365838.463	2200144.729	10.55	01:46 pm	4.10	6.45	02:46 pm	4.1	6.40	05:48 pm	4.27	6.28
MPT-2-5	365958.465	2200114.406	9.91	01:49 pm	3.38	6.53	02:50 pm	3.35	6.56	05:45 pm	3.49	6.42
MPT-2-P5	366452.771	2201086.692	7.15	01:59 pm	4.58	2.57	02:29 pm	4.65	2.50	04:25 pm	4.3	2.85
MPT-22-MW-1	368582.711	2200638.399	7.15	02:03 pm	2.12	5.03	02:24 pm	2.31	4.84	06:25 pm	2.43	4.72
MPT-13-MW-4	367688.017	2201085.379	9.88	02:04 pm	4.73	5.15	01:29 pm	5.09	4.79	03:55 pm	5.18	4.70

See notes at end of table.

**Table B-1 (Continued)
Summary of Water Level Survey Data**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Well/Location	X Easting State Plan	Y Northing State Plan	Z Elev. (MSL)	Synoptic Water Level 02/16/92			Synoptic Water Level 03/25/92			Synoptic Water Level 04/20/92		
				Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)
MPT-2-10	366391.758	2200333.638	10.02	02:05 pm	3.60	6.42	02:35 pm	3.41	6.61	06:20 pm	3.94	6.08
MPT-2-9S	366127.368	2200345.514	10.50	02:07 pm	4.19	6.31	02:40 pm	4.22	6.28	06:10 pm	4.55	5.95
MPT-13-3	367740.557	2200862.186	10.41	02:08 pm	5.62	4.79	01:24 pm	5.74	4.67	04:00 pm	5.95	4.46
MPT-2-9D	366127.723	2200338.658	10.49	02:10 pm	7.58	2.91	02:40 pm	7.87	2.62	06:12 pm	7.81	2.68
MPT-13-2	367476.397	2201306.774	12.79	02:11 pm	6.97	5.82	01:26 pm	7.23	5.56	03:40 pm	7.26	5.53
MPT-13-MW-5	367718.672	2201499.204	10.04	02:14 pm	3.74	6.30	01:45 pm	3.99	6.05	03:37 pm	4.03	6.01
MPT-13-P3	367715.816	2201497.109	10.18	02:16 pm	3.90	6.28	01:44 pm	4.15	6.03	12:00 am	NM	NM
MPT-2-P3	363421.216	2198074.836	31.93	02:16 pm	25.54	6.39	03:18 pm	25.69	6.24	05:38 pm	25.7	6.23
MPT-13-P4	368068.628	2201301.348	9.31	02:20 pm	3.62	5.69	01:51 pm	3.78	5.53	03:50 pm	3.92	5.39
MPT-2-P6	367964.790	2200321.549	5.10	02:20 pm	2.80	2.30	03:04 pm	4.42	0.68	06:35 pm	2.86	2.24
MPT-17-P1	369942.212	2201071.345	7.97	02:25 pm	4.62	3.35	01:02 pm	5.38	2.59	03:15 pm	5.32	2.65
MPT-8-1	366284.731	2204730.621	15.75	02:39 pm	8.61	7.14	01:45 pm	9.03	6.72	02:39 pm	NM	NM
MPT-9-1	367081.424	2205218.756	14.42	02:50 pm	12.62	1.80	01:55 pm	12.67	1.75	04:51 pm	12.53	1.89
S-3	366783.909	2205411.607	11.9	NM	NM	NM	01:00 pm	10.31	1.59	01:54 pm	10.08	1.82
MPT-9-2	367012.317	2205465.382	13.39	NM	NM	NM	01:05 pm	11.73	1.66	01:58 pm	11.59	1.80
MPT-9-3	367182.992	2205507.619	11.53	NM	NM	NM	01:15 pm	10.86	0.67	02:04 pm	9.89	1.64
S-2	366493.825	2205369.655	10.08	NM	NM	NM	01:30 pm	8.49	1.59	02:13 pm	8.34	1.74
STAFF GAGE CG	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	6.1	NM
STAFF GAGE NB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	3.15	NM
STAFF GAGE MU	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.6	NM
MPT-13-P1	366075.640	2201715.978	11.04	NM	NM	NM	NM	NM	NM	NM	2.8	8.24
COAST GD. MAY 3	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MAY-1330-1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MAY-1330-3	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MAY-1330-6	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MAY-1330-8	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MAY-1330-10	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

See notes at end of table.

DRAFT

Table B-1 (Continued)
Summary of Water Level Survey Data

Phase 1 RCRA Facility Investigation
 NAVSTA Mayport
 Mayport, Florida

Synoptic Water Level
 05/13/92

Well/Location	X Easting State Plan	Y Northing State Plan	Z Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Avg. Depth ¹ (MSL)	Depth Standard Deviation ²
MPT-1-2	372520.267	2202618.261	16.89	02:55 pm	NM	NM	4.80	0.00
MPT-2-2	368573.739	2199855.356	7.56	05:20 pm	4.06	3.50	3.91	0.25
MPT-2-6	365492.524	2199779.885	9.43	05:03 pm	4.62	4.81	5.44	0.78
MPT-2-MW-12D	368319.800	2198211.851	5.42	06:16 pm	3.18	2.24	2.19	0.16
MPT-2-MW-12S	368318.326	2198209.618	5.51	06:15 pm	3.44	2.07	2.09	0.24
MPT-2-MW-17D	365773.232	2197411.958	7.79	06:25 pm	3.77	4.02	3.98	0.17
MPT-2-MW-17S	365775.389	2197409.629	7.73	06:26 pm	3.09	4.64	4.30	0.21
MPT-2-P2	365498.303	2198464.046	7.97	NM	NM	NM	5.13	0.03
MPT-2-P4	364241.389	2198966.849	32.74	05:20 pm	26.94	5.80	5.71	0.39
MPT-2-P13	367408.890	2199402.723	11.87	06:42 pm	3.67	8.20	8.79	0.59
MPT-8-2	366261.822	2204968.168	13.93	NM	FP	NM	NM	NM
MPT-8-3	366363.387	2205069.447	13.72	NM	FP	NM	NM	NM
MPT-9-P1	367665.521	2205413.578	12.22	01:14 pm	10.95	1.27	1.43	0.12
MPT-11-MW-1	369851.230	2205130.879	12.16	01:43 pm	10.69	1.47	1.41	0.13
MPT-11-MW-3	369802.751	2205342.926	9.97	01:28 pm	8.49	1.48	1.40	0.14
MPT-13-1	368004.036	2202051.504	13.06	04:11 pm	7.76	5.30	7.07	2.26
MPT-13-MW-6	367684.002	2201904.440	9.66	04:08 pm	2.98	6.68	6.79	0.08
MPT-13-P5	367115.325	2200912.227	6.45	06:29 pm	3.45	3.00	3.56	0.41
MPT-13-P6	366879.480	2202120.087	10.16	04:23 pm	2.66	7.50	7.72	0.44
MPT-14-2	374680.537	2203726.012	8.64	NM	NM	NM	2.69	0.43
MPT-15-P3			10.19	NM	NM	NM	NM	NM
MPT-22-MW-1	366582.711	2200638.399	6.93	06:22 pm	3.31	3.62	4.35	0.52
S-4	364658.446	2199526.503	9.61	0.746528	6.64	2.97	3.03	0.10
MPT-2-3	364604.886	2199038.697	17.20	03:30 pm	9.23	7.97	8.07	0.09
MPT-14-P2	375562.214	2204016.180	5.71	01:55 pm	3.9	1.81	1.87	0.11
MPT-14-1	374860.123	2203770.865	7.56	02:00 pm	5.96	1.60	1.90	0.20
MPT-14-P1	374024.697	2203675.557	6.50	02:05 pm	4.76	1.74	1.39	0.53
MPT-1-P1	372912.043	2203345.224	7.11	02:12 pm	4.56	2.55	2.73	0.16
MPT-1-P3	372166.046	2202846.027	11.04	02:17 pm	7.94	3.10	3.17	0.49
MPT-1-1	372928.999	2202286.898	16.96	02:24 pm	12.16	4.80	5.13	0.27
MPT-1-P2	373338.715	2202891.025	11.77	01:50 pm	8.29	3.48	3.79	0.24
MPT-17-P2	370630.280	2201113.614	7.72	02:20 pm	5.62	2.10	2.57	0.27
MPT-2-15-SR	367584.874	2200460.565	6.65	07:40 pm	3.7	2.95	3.00	0.12
MPT-2-MW-16S	365475.365	2200288.986	6.73	03:01 pm	3.35	3.38	3.68	0.22
MPT-2-15-DR	367585.292	2200457.999	6.89	07:08 pm	3.97	2.92	2.94	0.09
MPT-2-MW-16D	365475.209	2200286.791	6.69	03:00 pm	3.9	2.79	2.62	0.50
S-1	366904.007	2204505.599	14.66	NM	NM	NM	9.26	0.11
MPT-10-P1	365963.797	2204745.462	10.68	02:15 pm	9.6	1.08	1.79	0.50
MPT-8D-P1	367186.012	2204936.811	12.89	01:55 pm	9.23	3.66	6.00	1.36
MPT-11-MW-2	369902.227	2205331.985	10.42	NM	NM	NM	3.93	3.80
MPT-2-MW-4R	365011.200	2199896.717	8.29	NM	NM	NM	3.14	0.08
MPT-15-P1	365689.153	2204181.740	13.28	02:29 pm	9.09	4.19	4.42	0.20
MPT-2-P12	365157.004	2196870.257	32.75	05:37 pm	24.54	8.21	8.61	0.32
MPT-2-P11	364395.626	2196198.862	31.85	04:40 pm	26.06	5.79	6.24	0.66

See notes at end of table.

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**Table B-1 (Continued)
Summary of Water Level Survey Data**

Phase 1 RCRA Facility Investigation
NAVSTA Mayport
Mayport, Florida

Synoptic Water Level
05/13/92

Well/Location	X Easting State Plan	Y Northing State Plan	Z Elev. (MSL)	Time (LCL)	Depth (TOC)	Elev. (MSL)	Avg. Depth ¹ (MSL)	Depth Standard Deviation ²
MPT-2-P10	363415.515	2195899.820	32.02	04:49 pm	24.49	7.53	9.32	1.78
MPT-2-MW-11S	368644.337	2198829.883	5.73	06:06 pm	3.26	2.47	2.99	0.41
MPT-2-P9	362977.876	2197566.006	32.18	04:59 pm	26.55	5.63	6.22	0.77
MPT-2-P8	367731.872	2197416.959	6.35	NM	NM	NM	2.93	0.06
MPT-2-P7	366597.014	2197396.923	7.95	NM	NM	NM	4.05	0.08
MPT-2-7S	365926.741	2197405.627	10.49	03:44 pm	6.88	3.61	4.02	0.25
MPT-2-7D	365934.423	2197403.643	9.70	03:51 pm	6.71	2.99	3.05	0.08
MPT-2-P1	365497.218	2199063.857	7.75	NM	NM	NM	4.83	0.01
MPT-2-1	365498.666	2199297.512	10.33	06:30 pm	6.18	4.15	4.22	0.05
MPT-2-8	365838.463	2200144.729	10.55	NM	NM	NM	6.38	0.07
MPT-2-5	365958.465	2200114.406	9.91	NM	NM	NM	6.50	0.06
MPT-2-P5	366452.771	2201086.692	7.15	NM	NM	NM	2.64	0.15
MPT-22-MW-1	366582.711	2200638.399	7.15	NM	NM	NM	4.86	0.13
MPT-13-MW-4	367688.017	2201085.379	9.88	06:59 pm	8.41	1.47	4.03	1.49
MPT-2-10	366391.758	2200333.638	10.02	05:14 pm	4.68	5.34	6.11	0.48
MPT-2-9S	366127.368	2200345.514	10.50	05:10 pm	5.1	5.40	5.99	0.37
MPT-13-3	367740.557	2200862.186	10.41	06:57 pm	6.37	4.04	4.49	0.29
MPT-2-9D	366127.723	2200338.658	10.49	01:55 am	4.93	5.56	3.44	1.23
MPT-13-2	367476.397	2201306.774	12.79	06:44 pm	7.35	5.44	5.59	0.14
MPT-13-MW-5	367718.672	2201499.204	10.04	NM	NM	NM	6.12	0.13
MPT-13-P3	367715.816	2201497.109	10.18	04:55 pm	4.47	5.71	6.01	0.23
MPT-2-P3	363421.216	2198074.836	31.93	05:05 pm	25.89	6.04	6.22	0.12
MPT-13-P4	368068.628	2201301.348	9.31	06:50 pm	4.21	5.10	5.43	0.22
MPT-2-P6	367964.790	2200321.549	5.10	NM	NM	NM	1.74	0.75
MPT-17-P1	369942.212	2201071.345	7.97	NM	NM	NM	2.86	0.34
MPT-8-1	366284.731	2204730.621	15.75	NM	NM	NM	6.93	0.21
MPT-9-1	367081.424	2205218.756	14.42	02:38 pm	12.65	1.77	1.80	0.05
S-3	366783.909	2205411.607	11.9	NM	NM	NM	1.71	0.12
MPT-9-2	367012.317	2205465.382	13.39	NM	NM	NM	1.73	0.07
MPT-9-3	367182.992	2205507.619	11.53	NM	NM	NM	1.16	0.49
S-2	366493.825	2205369.655	10.08	NM	NM	NM	1.67	0.08
STAFF GAGE CG	NM	NM	NM	NM	NM	NM	NM	NM
STAFF GAGE NB	NM	NM	NM	NM	NM	NM	NM	NM
STAFF GAGE MU	NM	NM	NM	NM	NM	NM	NM	NM
MPT-13-P1	366075.640	2201715.978	11.04	NM	4.48	NM	NM	NM
COAST GD. MAY 3	NM	NM	NM	01:35 pm	4.79	NM	NM	NM
MAY-1330-1	NM	NM	NM	NM	NM	NM	NM	NM
MAY-1330-3	NM	NM	NM	03:45 pm	6.6	NM	NM	NM
MAY-1330-6	NM	NM	NM	NM	NM	NM	NM	NM
MAY-1330-8	NM	NM	NM	NM	NM	NM	NM	NM
MAY-1330-10	NM	NM	NM	NM	NM	NM	NM	NM

¹Arithmetic average of all water level measurements for each well.

²Standard deviation of all water level measurements for each well.

Notes: MSL = mean sea level. NM = not measured.
LCL = local. FP = free product.
TOC = top of casing.

APPENDIX C

KBN BIOLOGICAL INVENTORY REPORT

**BIOLOGICAL FIELD
INVESTIGATION
NAVAL STATION MAYPORT**

Prepared for

**ABB Environmental Services, Inc.
Tallahassee, Florida 32301**

Prepared by

**KBN Engineering and Applied Sciences, Inc.
Gainesville, Florida**

**Subcontract 1-08-388
Project Number 32010C
May, 1992**

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LIST OF ACRONYMS

ABB-ES	ABB-Environmental Services, Inc.
CLEAN	Comprehensive Long-Term Environmental Action Navy
cm	centimeter
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
F.A.C.	Florida Administrative Code
FDER	Florida Department of Environmental Regulation
ft	feet
IAS	Initial Assessment Study
KBN	KBN Engineering and Applied Sciences, Inc.
mg/l	milligram per liter
mL	milliliter
mm	millimeter
MPT	Mayport
NAVSTA	U.S. Naval Station
NIRP	Navy Installation Restoration Program
ppt	parts per thousand
PVC	polyvinyl chloride
QAPP	Quality Assurance Program Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SDIV	Southern Division, Naval Facilities Engineering Command
SWMU	solid waste management unit
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
μ	micron
μ mhos/cm	micromhos per centimeter

1.0 INTRODUCTION

Eighteen solid waste management units (SWMUs) have been identified by the U.S. Environmental Protection Agency (EPA) at the U.S. Naval Station (NAVSTA) at Mayport, Duval County, Florida. Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFIs) are required at these sites to determine the nature and extent of releases and potential pathways of contamination emanating from these sites via air, land, surface water, or groundwater. KBN Engineering and Applied Sciences, Inc. (KBN) was subcontracted by ABB-Environmental Services, Inc. (ABB-ES), to conduct biological surveys at the NAVSTA Mayport site for SWMUs located in Group I, as defined in the RFI Work Plan (ABB-ES, 1991). These investigations are being conducted on behalf of the Southern Division, Naval Facilities Engineering Command (SDIV) under Contract Number N62467-89-D-0367, Comprehensive Long-Term Environmental Action Navy (CLEAN) District I.

Previous biological investigations at the site conducted as part of the Initial Assessment Study (IAS) defined the locations of ecosystems and potential environmental receptors on NAVSTA Mayport [Environmental Science and Engineering, Inc. (ESE), 1986]. Threatened, endangered, or protected species potentially occurring in the vicinity of the site were also identified. The current study further documents the environmental conditions at the site and presents new information regarding the aquatic ecosystem. ABB-ES will use this information to identify actual or potential environmental receptors to be used in ecological risk assessments as part of the facility-wide exploration.

2.0 MATERIALS AND METHODS

Phase I and partial Phase II biological field investigations were conducted at NAVSTA Mayport the week of January 20, 1992. The objectives of the Phase I biological field investigation were to:

1. Identify basic environmental characteristics, and
2. Identify important aquatic and terrestrial organisms (receptors).

These objectives were accomplished by conducting aquatic and terrestrial field surveys at selected locations at NAVSTA Mayport. The locations were SWMUS 2, 3, 4, 5, and 13 [corresponding to Navy Installation Restoration Program (NIRP) Sites 2, 4, 5, 6, and 13]. These SWMUs are described in detail in the RFI Workplan of NAVSTA (ABB-ES, 1991) and are cross-referenced in Table 2-1.

The objectives of a Phase II biological field investigation are to:

1. Identify areas of contamination and ecological effects,
2. Estimate the magnitude and variation of toxic effects, and
3. Identify contaminant levels in aquatic biota.

KBN was subcontracted to provide additional information in order to achieve the Phase II objectives. Quantitative benthic surveys (bioassessment methods) were conducted at SWMUs 2, 3, 4, and 5 (NIRP Sites 2, 4, 5, and 6). Bioassessment methods such as quantitative benthic surveys are used to define ecological effects of on-site contamination.

2.1 AQUATIC BIOLOGICAL SURVEYS

2.1.1 DESCRIPTION OF SAMPLING STATIONS

Twelve stations were sampled during the biological field investigation including three reference stations. These stations were selected by ABB-ES personnel in accordance with the RFI Work Plan as modified by actual field conditions, with one exception; KBN provided input on the location of SWMU 13 (NIRP Site 13) stations. The station locations are shown in Figures 1 and 2. The reference stations were (Figure 1):

- MPT-B-BIO-1,
- MPT-B-BIO-2, and
- MPT-B-BIO-3.

Table 2-1. Site Numbering and Nomenclature—NAVSTA Mayport

SWMU	NIRP Site	Description
2	2	Landfill B
3	4	Landfill D
4	5	Landfill E
5	6	Landfill F
13	13	Old Fire Training Area

Source: ABB-ES, 1991.

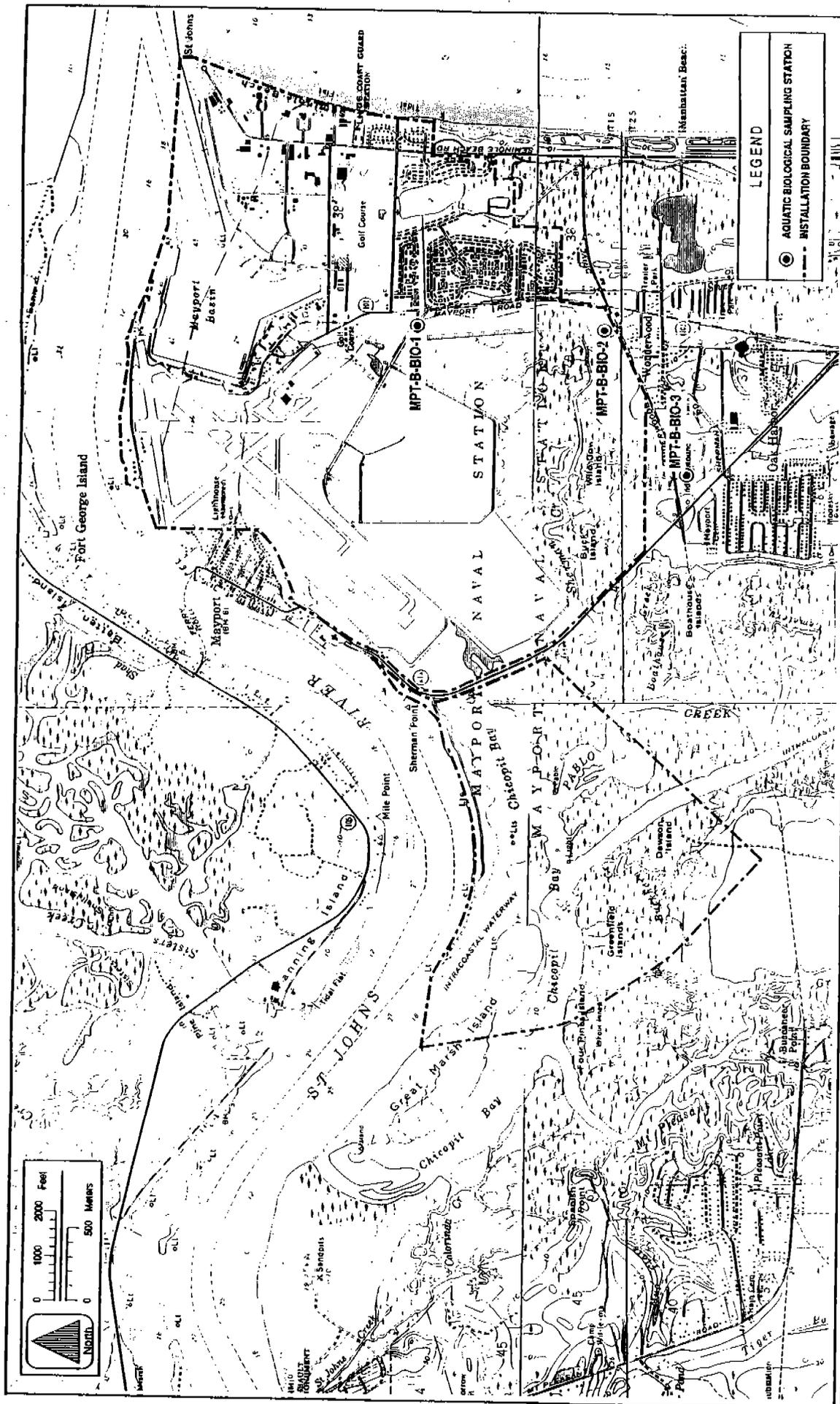


Figure 1 SITE LOCATION, U.S. NAVAL STATION, MAYPORT, FLORIDA
BACKGROUND AQUATIC BIOLOGICAL SAMPLING LOCATIONS



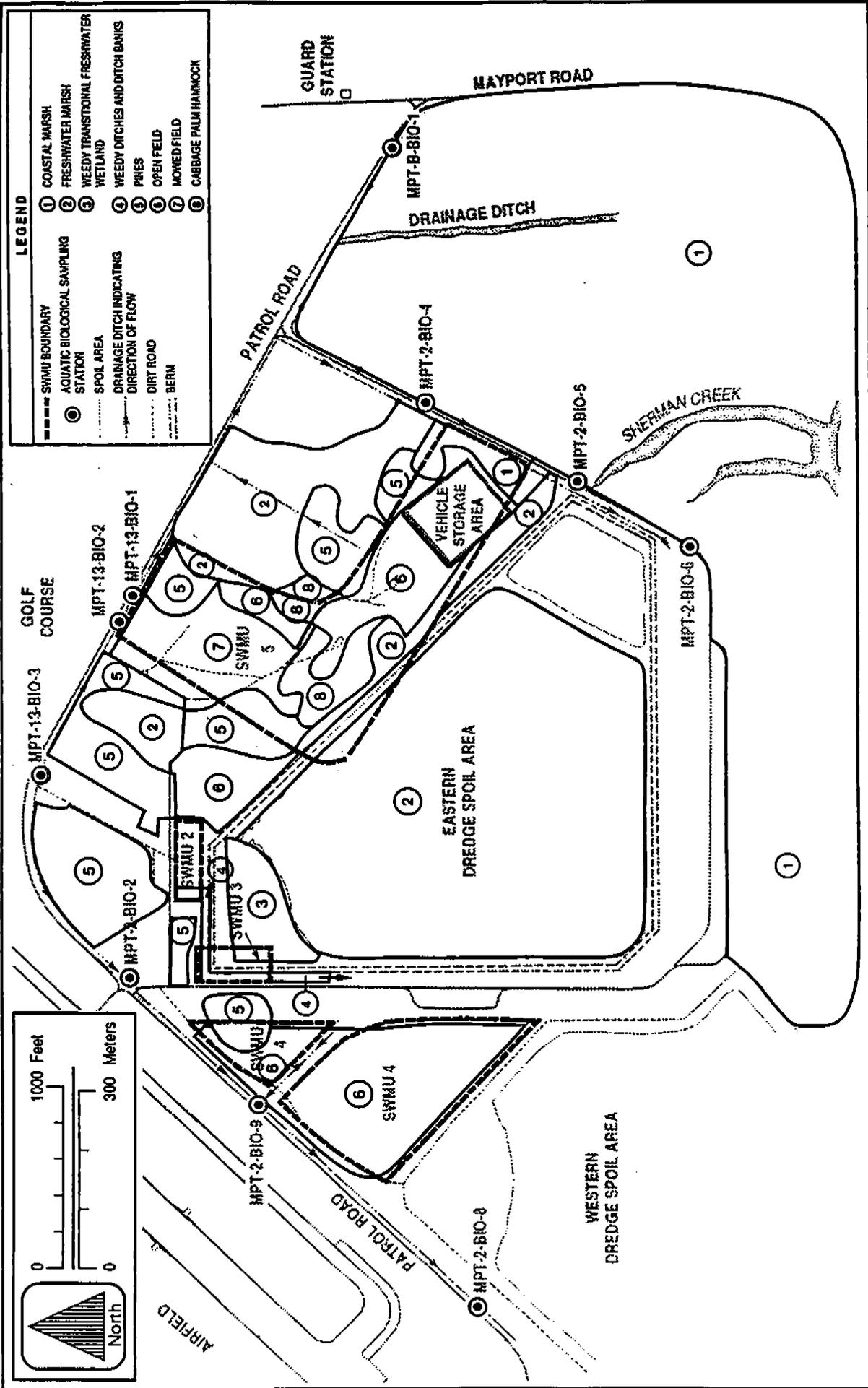


Figure 2 LOCATION OF SOLID WASTE MANAGEMENT UNITS (SWMUs) 2, 4, 5, AND 6, HABITATS, AND AQUATIC BIOLOGICAL SAMPLING STATIONS

Six stations were sampled near SWMUs 2, 3, 4, and 5 (NIRP Sites 2, 4, 5, and 6) and were identified as (Figure 2):

MPT-2-BIO-2,
MPT-2-BIO-4,
MPT-2-BIO-5,
MPT-2-BIO-6,
MPT-2-BIO-8, and
MPT-2-BIO-9.

Three stations were sampled near SWMU 13 (Figure 2):

MPT-13-BIO-1,
MPT-13-BIO-2, and
MPT-13-BIO-3.

The following is a description of these sampling stations.

MPT-B-BIO-1

This station was located within the tidal ditch along the secondary entrance/patrol road immediately inside of the NAVSTA Mayport perimeter (Figures 1 and 2). The tidal ditch was connected to, and tidally influenced by, the major north-south drainage ditch immediately west of the station location. This north-south drainage ditch connected to Sherman Creek. Tidal fluctuation at this location was approximately 4 feet (ft). This location also received surface water runoff from a golf course pond through a 12-inch-diameter pipe fitted with a flap gate. The flap gate, however, was fixed in an open position, allowing tidal exchange to the golf course pond.

The ditch was approximately 25 ft wide (to landward edges of wetland vegetation). The center of the ditch was unvegetated with a shelly to fine sand bottom. The banks of the ditch were vegetated with cordgrass (*Spartina alterniflora*). The sediment along the banks was soft mud.

MPT-B-BIO-2

This station was located north of Wonderwood Drive on a small tributary to Sherman Creek (Figure 1). The station was tidally influenced but the observed flow was toward Sherman Creek (northward) during the sampling period (i.e., ebb tide is typically stronger than flood tide). Tidal fluctuation at this location was approximately 3 ft. Two 24-inch-diameter culverts channelized the

flow of the creek under Wonderwood Drive. A sewage treatment plant was located south of Wonderwood Drive and had a stormwater discharge into the creek at the time of sampling.

The creek was approximately 10 ft wide (to the landward edges of wetland vegetation). The center of the creek was a muddy bottom littered with debris. The banks were vegetated with cordgrass. Duckweed (*Spirodela* sp.) was floating on the water surface. Transitional vegetation included cabbage palm (*Sabal palmetto*), Eastern red cedar (*Juniperus virginica*), giant maidencane (*Phragmites* sp.), oak (*Quercus* sp.), groundsel bush (*Baccharis* sp.), and wax myrtle (*Myrica cerifera*).

MPT-B-BIO-3

This station was located north of Wonderwood Drive on a tributary of Sherman Creek (Figure 1). As with the previous station, the flow was typically northward toward Sherman Creek. Tidal fluctuation was approximately 4 ft. This creek passed under Wonderwood Drive through a 4-ft box culvert. A crescent-shaped bar was formed on the north side of Wonderwood Drive by tidal flow action through the box culvert. This bar, exposed at low tide, consisted of predominately oyster shell debris.

The creek was greater than 30 ft wide. Bottom substrate in most areas except the bar was soft mud. Clumps of oysters (*Crassostrea virginica*) were observed along the vegetated edges of the creek. The contiguous vegetated saltmarsh was extensive. Most abundant saltmarsh vegetation included black needlerush (*Juncus roemerianus*) and cordgrass. Transitional vegetation included wax myrtle and cabbage palm.

MPT-2-BIO-2

This station was located within the NAVSTA Mayport patrol road drainage ditch north of SWMUs 2 and 3 (NIRP Sites 2 and 4) and may receive surface water runoff from those sites (Figure 2). The site may also be considered as downstream from Site 13. A deadend canal extended south from the station towards SWMU 3 (NIRP Site 4) but did not extend under the east-west road. The canal was connected tidally to the southwest through a 4-ft culvert under the north-south road. Tidal fluctuation was approximately 2 ft. The station was littered with debris from a 4-ft-diameter culvert.

The ditch was approximately 20 to 30 ft wide. Bottom substrate was soft mud. Emergent vegetation included cattail (*Typha* sp.). Transitional vegetation included cabbage palm, Eastern red cedar, and groundsel bush.

MPT-2-BIO-4

This station was the northernmost station along the ditch east of SWMU 5 (NIRP Site 6) and the eastern dredge spoil area (Figure 2). Tidal influence to this station could occur from the north and east (through the large "drainage ditch" east of the station) and from the south and east (from Sherman Creek). Tidal fluctuation was approximately 3 ft.

The canal was approximately 10 ft wide bordered on the east by high marsh and on the west by the road shoulder. Bottom substrate was sand and mud. The canal was lined with cordgrass. Transitional vegetation included salt grass (*Distichlis spicata*) in the high marsh and groundsel bush along the road shoulder.

MPT-2-BIO-5

This station was located east of SWMU 5 (NIRP Site 6) and the eastern dredge spoil area within the roadside canal (Figure 2). As described above, tidal influence along this ditch was from the northeast and southeast. This station, however, was probably more influenced by tributaries of Sherman Creek entering the high marsh area from the southeast (Figure 2). Tidal fluctuation at the station was approximately 3 ft. The station area received surface water runoff through a 3-ft-diameter culvert from the area of SWMU 5 (NIRP Site 6). This culvert was below the tide level; therefore, tidal waters entered the pipe. The opposite end of the culvert in SWMU 5 (NIRP Site 6) was not found.

The station area was approximately 15 to 20 ft wide bordered on the east by high marsh and a tributary to Sherman Creek and on the west by the road shoulder. Bottom substrate was soft mud. The canal was lined with cordgrass. High marsh vegetation included salt grass. The tributary to Sherman Creek was filled with cordgrass. Transitional vegetation along the road shoulder included groundsel bush.

MPT-2-BIO-6

This station was located southeast of SWMU 5 (NIRP Site 6) and eastern dredge disposal area within the roadside canal (Figure 2). Tidal influence to the area was from the tributaries of

Sherman Creek to the southeast. Tidal fluctuation at the site was approximately 3 ft. Four 12-inch-diameter culverts entered the station area from under the road presumably draining the low area south and at the base of the eastern dredge disposal area dike. A low flow drainage with a hydrogen sulfide-rich odor was entering the station area through these culverts. The pipes were installed above normal tidal level so that tidal water typically does not pass through the pipes.

The canal was approximately 10 ft wide at this station. Bottom substrate was soft mud. Cordgrass lined the canal and extended southeast toward Sherman Creek. Transitional vegetation along the road shoulder included groundsel bush.

MPT-2-BIO-8

This station was located in a tidal ditch at the base of the dike of the western dredge disposal area and southwest of SWMU 4 (NIRP Site 5) (Figure 2). The station was tidally connected to Chicopit Bay to the southwest (Figure 1). Tidal fluctuation at the site was approximately 3 ft.

The canal was approximately 30 ft wide. Bottom substrate was soft mud. Emergent vegetation lining the canal included cattail, cordgrass, and giant bulrush (*Scirpus californicus*). Transitional vegetation included groundsel bush.

MPT-2-BIO-9

This station was located northeast of MPT-2-BIO-8 along the same tidal ditch (Figure 2). The station area received surface water runoff from SWMU 4 (NIRP Site 5): to the southeast, through a 3-ft-diameter culvert and from the runway area; to the northwest, through a 3-ft-diameter culvert. Tidal fluctuation at the site appeared minimal. The site was receiving a flow of surface water from SWMU 4 (NIRP Site 5) which continued to flow northeast in the canal.

The canal was approximately 20 ft wide. Bottom substrate was sand and soft mud. Emergent vegetation included cattail and cordgrass. Duckweed was floating on the water coming from SWMU 4 (NIRP Site 5). Transitional vegetation included eastern red cedar and groundsel bush.

MPT-13-BIO-1

This station was located within the ditch along the patrol road northeast of SWMU 5 (NIRP Site 6) and southeast of SWMU 13 (NIRP Site 13) (Figure 2). Tidal influence to the station area was from the southeast. Tidal fluctuation at the station was approximately 3 to 4 ft.

The canal was approximately 12 ft wide. Bottom substrate was soft mud. Cordgrass lined the sides of the canal. Transitional vegetation included cabbage palm and groundsel bush.

MPT-13-BIO-2

This station was located within the ditch along the patrol road northeast of SWMU 5 (NIRP Site 6) and directly south of SWMU 13 (NIRP Site 13) (Figure 2). The station was directly up tidal gradient from MPT-13-BIO-1 and separated from that station by a 4-ft-diameter culvert under a roadway. Tidal fluctuation at the site was approximately 3 ft. The station area received surface water runoff from SWMU 13 (NIRP Site 13) through a 3-ft-diameter culvert.

The canal was approximately 20 ft wide. Bottom substrate was soft mud. Cordgrass lined the sides of the canal and formed an island in the center of the canal at the surface water discharge location. Transitional vegetation included groundsel bush.

MPT-13-BIO-3

This station was located within the ditch along the patrol road southwest of SWMU 13 (NIRP Site 13) (Figure 2). This station was located at the extent of tidal influence from the southeast or the southwest. Tidal fluctuation was minimal. The station location was connected by a 3-ft-diameter culvert to a surface water retention pond located across the patrol road to the north of the station.

The canal was approximately 20 ft wide. Bottom substrate was soft mud. The shoreline was lined with cordgrass. Transitional vegetation included cabbage palm, eastern red cedar, and groundsel bush.

2.1.2 AQUATIC SURVEY METHODS

The aquatic survey included qualitative and quantitative sampling at all stations except the stations near SWMU 13 (NIRP Site 13) (i.e., MPT-13-BIO-1, MPT-13-BIO-2, and MPT-13-BIO-3) where only qualitative samples were collected and analyzed, as specified in the RFI Work Plan (ABBES, 1991). A detailed description of field methods is presented in the following subsections.

Qualitative Surveys—A qualitative aquatic biological survey was conducted at all stations sampled. The qualitative survey included measurements of basic physical and chemical water

quality parameters, descriptions of the major aquatic habitats comprising the sampling location, and collection of aquatic organisms.

Basic physical and chemical parameters collected at each station included: depth, water body width, bottom substrate type, water clarity, water flow, conductivity, salinity, pH, temperature, and dissolved oxygen levels. Many of the stations sampled were tidally influenced; parameters such as depth, water clarity, and water flow are affected by the tidal condition at the station at the time of sampling (see Appendices A and B for sampling time and predictions of times of high and low tide during the sampling period). Conductivity, salinity, pH, temperature, and dissolved oxygen levels were measured using a Hydrolab Corporation Surveyor® II. Water flow was estimated using a drogue timed over a measured distance. Calibration and use of instrumentation are described in KBN's Comprehensive Project Quality Assurance Program Plan (QAPP). Copies of applicable QAPP sections are included in Appendix C.

Aquatic organisms were collected from as many different habitats as possible at each station. Fish and macroinvertebrates were collected using D-frame aquatic dip nets and seines. These samples were fixed with 10 percent formalin. Phytoplankton and zooplankton were collected using a 2-inch [5.1 centimeter (cm)] polyvinyl chloride (PVC) tube to collect a surface to near bottom water column sample. With the top end open, a PVC tube of appropriate length was lowered vertically into the water to approximately 0.2 m above the substrate. The top end of the tube was then stoppered and the tube vertically raised to the surface. With the open bottom end of the tube just below the surface, the open end was covered with a stopper, the tube was raised above the water surface, and the contents were released into a clean bucket. A minimum of five water column samples were pooled to collect approximately 1,000 milliliters (mL) of water for analysis. Samples were fixed with a 2 percent Lugol solution.

Preserved aquatic organisms were sorted in the laboratory and identified to the lowest practical taxonomic level. Taxonomic data were tabulated for each station.

Quantitative Surveys--The objective of the quantitative surveys was to use a bioassessment method to define the extent of ecological effects in the aquatic environment in the vicinity of SWMUs 2, 3, 4, and 5 (NIRP Sites 2, 4, 5, and 6) as compared to reference stations.

At each station, five replicate petite ponar samples were collected. The samples were sieved through a 0.5 millimeter (mm) screen and were fixed in 10 percent formalin with Rose Bengal added. In the laboratory, organisms were sorted from three replicate samples and identified to the lowest practical taxonomic level. Two replicate samples were archived for later analysis, if required.

Taxonomic data were tabulated as species lists and a summary of taxa and individuals within each phylum and each replicate collected per station. The following biological community parameters were used to summarize the data:

1. Total taxa and mean taxa per replicate found at each station.
2. Total number of individuals found at each station and extrapolated to number of individuals per square meter (density).

The structure and function of aquatic benthic communities (e.g., biological integrity) is defined in Chapter 17-3 Florida Administrative Code (F.A.C.) rules in terms of the Shannon-Weaver diversity index of benthic macroinvertebrates (\bar{d}).

Diversity is a measure of the heterogeneity in a community or assemblage of organisms. These indices vary with both the number of species present (species richness) and the distribution of individuals among species (equitability or evenness). Species richness and evenness were evaluated separately Margelef's Index of Species Richness (D) and an equitability index (e) (Appendix D). Community similarity was calculated to compare background reference stations to project area (SWMU) stations for similar species using the Community Loss Index. The percent composition of dominant taxa was calculated as the ratio of the taxonomic group with the most individuals (dominant) to the total number of organisms. The formulas for benthic indices are presented in Appendix D. The laboratory used for taxonomic analysis maintains an EPA-approved QA/QC program. Data are checked prior to analysis and randomly checked for calculation errors following analysis.

2.2 WETLAND AND TERRESTRIAL BIOLOGICAL SURVEYS

2.2.1 AREAS SURVEYED

Qualitative biological surveys were conducted January 23, 1992. The surveys were conducted in order to obtain information on wetlands, vegetation, and wildlife habitats for SWMUs 2, 3, 4, 5, and 13 (NIRP Sites 2, 4, 5, 6, and 13.) The results of the surveys were used to verify the

communities and habitats described in the IAS (ESE, 1986). The surveys were conducted on foot throughout the sites. Habitats were characterized according to Myers and Ewel (1990).

2.2.2 WETLANDS

The wetland identifications were made following guidelines of the U.S Army Corps of Engineers (USACE, 1989) and the Florida Department of Environmental Regulation (FDER) [Florida Statutes (FS) 403, Tallahassee, Florida]. Each site was examined for topographic features and vegetation that would characterize wetlands. Areas determined to be wetlands were marked on a field map, which was used to prepare Figure 2.

Federal Jurisdiction--USACE is charged with regulating wetlands in conjunction with EPA and the U.S. Fish and Wildlife Service (USFWS). USACE categories and definitions are given in Table 2-2. A plant community is a wetland under this system if the combination of coverage of all species with a obligate wetland, facultative wetland, and/or facultative status is 50 percent or greater.

State of Florida Jurisdiction--FDER is the state agency which regulates wetlands in Florida. The FDER definitions below refer to the Florida list of plant species that determine wetlands under the Henderson Act (FS 403).

S (submerged) - plant species that are always found in wetlands.

T (transitional) - plant species that are found in both wetlands and uplands.

I (invisible) - plant species that are to be disregarded when making wetland assessments.

U (upland) - plant species that are always found in uplands.

Regional Jurisdiction--Five regional water management districts exert additional regulatory authority over wetlands. The St. Johns River Water Management District (SJRWMD) has jurisdiction in northeast Florida (FS 120 and FS 373, Tallahassee, Florida). FDER has delegated its responsibility for dredge and fill permitting to SJRWMD. SJRWMD uses the same list of plant species that FDER uses as authorized under the Henderson Act.

Determinations are normally made using the top stratum (canopy). An asterisk (*) indicates that, if strata are combined, this species is considered submerged. A site is considered a wetland if the combination of S and T is greater than 50 percent, S is greater than 10 percent, and S is greater than U.

Table 2-2. Federal Regional Indicator Categories

Category	Definition
OBL (obligate wetland)	Plants that occur almost always (estimated probability 99-100%) under natural conditions in wetlands.
FACW (facultative wetland)	Plants that usually occur in wetlands (estimated probability 67-99%), but are occasionally found in nonwetlands.
FAC (facultative)	Plants that are equally likely to occur in wetlands or nonwetlands (estimated probability 34-66%).
FACU (facultative upland)	Plants that usually occur in nonwetlands (estimated probability 67-99%), but are occasionally found in wetlands (estimated probability 1-33%).

Source: USACE, Section 404, Clean Water Act. Federal Interagency Committee for Wetland Delineation. 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. USACE, EPA, USFWS, and U.S. Department of Agriculture Soil Conservation Service, Washington, DC. Cooperative Technical Publication.

2.2.3 TERRESTRIAL WILDLIFE

The wildlife survey was conducted January 23, 1992, by a field team consisting of a wildlife biologist and a wetland biologist. Prior to the survey, the IAS (ESE, 1986) was examined for information on reported habitats and wildlife species. The survey was accomplished by systematic walkover throughout each site. During the survey, wildlife species were identified through actual observations, as well as from tracks, scat, and bird calls. The survey was augmented by observations of the field personnel conducting the aquatic sampling during January the period January 20 to 22, 1992.

A list of endangered species, threatened species, and species of special concern for Duval County, Florida, was obtained from the Florida Natural Areas Inventory (Muller, 1990). KBN is familiar with all of the species on this list. Those species which occur in habitats found on these sites were reviewed. The sites were searched for the occurrence of the listed species, as were the habitats in which they could reasonably be expected to occur.

3.0 RESULTS AND DISCUSSION

3.1 QUALITATIVE AQUATIC BIOLOGICAL SURVEYS

3.1.1 WATER QUALITY

Table 3-1 contains the water quality parameters collected at each station during the biological surveys. The pH values ranged between 6.26 at station MPT-2-BIO-6 to 7.89 at station MPT-13-BIO-3. Dissolved oxygen values ranged from 2.72 milligram per liter (mg/l) at station MPT-13-BIO-3 to 9.16 mg/l at station MPT-B-BIO-3. Water temperature values ranged from 8.46°C at station MPT-13-BIO-2 to 13.46°C at station MPT-2-BIO-2. Conductivity values ranged from 3.69 micromhos per centimeter ($\mu\text{mhos/cm}$) at station MPT-B-BIO-2 to 24.48 $\mu\text{mhos/cm}$ at station MPT-B-BIO-1. Salinity values ranged from 1.5 parts per thousand (ppt) at station MPT-B-BIO-2 to 14.7 ppt at station MPT-B-BIO-1.

At most of the stations, tidal activity had the greatest influence on the water quality. Stations MPT-B-BIO-1, MPT-B-BIO-2, MPT-B-BIO-3, MPT-2-BIO-4, MPT-2-BIO-5, and MPT-2-BIO-6 are tidally influenced by Sherman Creek. Stations MPT-2-BIO-2, MPT-2-BIO-8, and MPT-2-BIO-9 are tidally influenced by Chicopit Bay. Sherman Creek is tidally connected with Pablo Creek which connects to Chicopit Bay and the Intracoastal Waterway. Stations MPT-13-BIO-1, MPT-13-BIO-2, and MPT-13-BIO-3 are located between these drainage pathways. This situation is particularly evident at station MPT-13-BIO-3. The pH and dissolved oxygen values were low at this station possibly indicating a nodal point of tidal influence and low water movement and/or influence from the nearby surface water impoundment. Station MPT-B-BIO-2 was located near a sewage treatment plant. The plant's stormwater discharge into the creek may be the reason for the lower conductivity and salinity values recorded at these locations relative to other stations. However, as indicated in the station description (Section 2.1.1), there was no evidence of discharge at the time of sampling.

3.1.2 BENTHIC MACROINVERTEBRATES

Table 3-2 presents the benthic macroinvertebrates collected during the quantitative survey. These data are presented here in a qualitative manner. The reference stations and station MPT-2-BIO-4 had the greatest number of taxa. These stations had the greatest representation of marine or estuarine organisms (mainly, polychaetes and marine amphipods). The most abundant taxa were oligochaetes and chironomids. Most abundant chironomid species included *Chironomus* sp. A, *Dicrotendipes* sp., and *Goeldichironomus holoprasinus*.

Table 3-1. Water Quality Data Collected During the Mayport Biological Field Investigation (January 20 Through 22, 1992)

Station	Flow (ft/sec, approx.)	pH	Dissolved Oxygen (mg/l)	Secchi (ft, estimated)	Temperature (°C)		Conductivity (µmhos/cm)	Salinity (ppt)
					Air	Water		
MPT-B-BIO-1	+ 4	7.51	8.48	≥ 3	16.00	10.52	24.48	14.70
MPT-B-BIO-2	≈ 4	6.81	5.65	1.5	9.52	11.31	3.69	1.50
MPT-B-BIO-3	≈ 8	6.85	9.16	1.5	8.20	11.11	12.49	7.00
MPT-13-BIO-1	≤ 1	7.17	4.35	≈ 1.5	3.90	8.70	11.27	6.00
MPT-13-BIO-2	slight to slack	7.39	5.95	0.5-1	6.74	8.46	11.52	6.20
MPT-13-BIO-3	slight	7.89	2.72	≤ 5	6.74	8.46	11.52	6.20
MPT-2-BIO-2	slight to slack	7.38	8.20	≤ 1.5	15.60	13.56	19.60	11.40
MPT-2-BIO-4	≤ 0.5	7.60	7.00	2	14.20	9.94	23.20	13.92
MPT-2-BIO-5	≈ 0.5	6.82	5.82	≤ 1	10.20	6.88	21.80	12.90
MPT-2-BIO-6	≈ 1.5	6.26	5.60	2	4.50	7.40	23.30	13.80
MPT-2-BIO-8	slight	7.40	5.20	≈ 1.5-2	14.60	13.11	22.14	12.40
MPT-2-BIO-9	≤ 1	7.32	8.80	2	15.70	12.97	20.50	12.10

Source : KBN Engineering and Applied Sciences, Inc., 1992.

Table 3-2. Benthic Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992)
(Page 1 of 7)

	Reference			MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3						
Annelida							r		
Hirudinea									
Hirudinea (LPIL)									
Oligochaeta	a	c	c	a	a	c	r		a
Oligochaeta (LPIL)									
Lumbriculidae	a				a			r	
Lumbriculidae (LPIL)									
Naididae				c	r				r
Naididae (LPIL)									
Tubificidae		r		c	a	c	c		c
Tubificidae (LPIL)									
<i>Tubificoides heterochaetus</i>	a				c	r			
Polychaeta	r	c			c		c		
Ampharetidae									
<i>Hobsonia florida</i>									
Capitellida	a				a				
<i>Capitella capitata</i>									
Capitellidae (LPIL)			r		r				
Hesionidae		r	c			r	a		
Hesionidae (LPIL)									
Maldanidae									
Maldanidae (LPIL)					r				

Note: r = rare (1 to 3 individuals).
 c = common (3 to 15 individuals).
 a = abundant (more than 15 individuals).
 LPIL = Lowest Possible Identification Level.

Source: KBN Engineering and Applied Sciences, Inc. (1992).

Table 3-2. Benthic Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992)
(Page 2 of 7)

	Reference			MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3						
Nereidae <i>Laeonereis culveri</i>	a	a	c		c				
Nereidae (LPIL)	r		c		r				
Spionidae <i>Polydora cornuta</i>	c		c		r				
<i>Polydora socialis</i>	r	r	r		c				
<i>Sireblosipio benedicti</i>	a		a		a				
Trichobranchiidae Trichobranchiidae (LPIL)					r		r		
Arthropoda (Arachnida) Acarina Acarina (LPIL)					r				
Hydracarina Hydracarina (LPIL)						r			
Arthropoda (Crustacea) Amphipoda Aoridae <i>Granditierella bonnieroides</i>			c						
Corophiidae Corophiidae (LPIL)			c						
<i>Corophium</i> (LPIL)	r		a						

Note: r = rare (1 to 3 individuals).
c = common (3 to 15 individuals).
a = abundant (more than 15 individuals).
LPIL = Lowest Possible Identification Level.

Table 3-2. Benthic Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992)
(Page 3 of 7)

	Reference			MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3						
<i>Corophium lacustris</i>			a						
Gammaridae	r						r		
Gammaridae (LPIL)									
<i>Gammarus</i> (LPIL)	r				r				
<i>Gammarus pulex</i>	r				c				
Melitidae		c	a						
<i>Melita</i> (LPIL)									
<i>Melita intermedia</i>			r						
Melitidae (LPIL)		r	c						
Talitridae					r				
<i>Orchestia grillus</i>									
<i>Orchestia</i> Sp. B					r				
Talitridae (LPIL)	r	r							
Decapoda (Natantia)					r				
Palaeomonidae									
<i>Palaeomonetes pugio</i>									
Decapoda (Reptantia)									
Portunidae					r				
<i>Callinectes sapidus</i>									

Note: r = rare (1 to 3 individuals).
 c = common (3 to 15 individuals).
 a = abundant (more than 15 individuals).
 LPIL = Lowest Possible Identification Level.

Source: KBN Engineering and Applied Sciences, Inc. (1992).

Table 3-2. Benthic Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992)
(Page 4 of 7)

	Reference			MPT-2 BIO-2	MPT-2 BIO-4	MPT-2 BIO-5	MPT-2 BIO-6	MPT-2 BIO-8	MPT-2 BIO-9
	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3						
Isopoda	r								
Anthuridae									
Anthuridae (LPIL)		r							
Cyathura (LPIL)									
Cyathura polita	r	c	c	r					
Ligidae	r			r					
<i>Vandeleiscia</i> Sp. A									
Sphaeromatidae		a	a	c	r			c	
<i>Cassidinidea ovalis</i>									
Sphaeromatidae (LPIL)		r							
Ostracoda									
Ostracoda (LPIL)			r						
Candonidae									r
Candonidae Genus A				r					
Cytherideidae									
Cytherideidae (LPIL)								r	
<i>Haplocytheridea</i> Sp. A	c					r	r		
Tanaidacea									
Paratanaidae	r	c	a		c				
<i>Hargeria</i> (LPIL)									
<i>Hargeria rapax</i>			r						

Note: r = rare (1 to 3 individuals).
c = common (3 to 15 individuals).
a = abundant (more than 15 individuals).
LPIL = Lowest Possible Identification Level.

Table 3-2. Benthic Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992)
(Page 5 of 7)

	Reference			MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3						
Paratanaiidae (LPIL)		r	r						
Arthropoda (Insecta)				r					
Coleoptera									
Chrysomelidae									
<i>Agasicles hygrophila</i>				r	r			r	
Collembola									
Isotomidae									
<i>Isotomurus palustris</i>									
Diptera									
Chironomidae									
Chironomidae Genus AI									
<i>Chironomus</i> Sp. A	c	a	c	a	c	r	c	c	c
<i>Dicrotendipes</i> (LPIL)	a	c	c			a	r	r	
<i>Goeldichironomus holoprasinus</i>		r		a	a	c	c	a	a
<i>Polypedium scalenum</i>		r	r						
Ephydriidae									
Ephydra (LPIL)				r					
Muscidae						r			
Muscidae (LPIL)									
Psychodidae									
<i>Telmatoctopus Superbus</i>									

Note: r = rare (1 to 3 individuals).
 c = common (3 to 15 individuals).
 a = abundant (more than 15 individuals).
 LPIL = Lowest Possible Identification Level.

Source: KBN Engineering and Applied Sciences, Inc. (1992).

Table 3-2. Benthic Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992)
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	Reference			MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3						
Stratiomyidae				r					
<i>Stratiomys</i> (LPIL)				r					r
Tipulidae									
<i>Ormosia</i> Sp. A									c
Tipulidae (LPIL)									
Hemiptera				r					
Corixidae									
<i>Hesperocorixa minor</i>									r
Lepidoptera									
Pyralidae									
<i>Vogelia</i> (LPIL)									
Odonata				r					
Coenagrionidae									
<i>Enallagma</i> (LPIL)								r	
Mollusca									
Gastropoda	r						r		
Gastropoda (LPIL)									
Hydrobiidae									
Hydrobiidae (LPIL)		r		r	r	c	c	c	
Melampidae									
<i>Melampus bidentatus</i>		r					r		

Note: r = rare (1 to 3 individuals).
 c = common (3 to 15 individuals).
 a = abundant (more than 15 individuals).
 LPIL = Lowest Possible Identification Level.

Table 3-2. Benthic Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992)
(Page 7 of 7)

	Reference			MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3						
Pelecypoda Pelecypoda (LPIL)	r				r	r	r		
Mytilidae <i>Amegdalum sagittatum</i>					r				
Rhynchocoela Rhynchocoela (LPIL)			r						

Note: r = rare (1 to 3 individuals).
 c = common (3 to 15 individuals).
 a = abundant (more than 15 individuals).
 LPIL = Lowest Possible Identification Level.

Source: KBN Engineering and Applied Sciences, Inc. (1992).

3.1.3 FISH AND MACROINVERTEBRATES

Table 3-3 contains the fish and macroinvertebrate species collected at NAVSTA Mayport using D-frame dip nets and seines. The fish community observed is typical for estuarine tidal creeks in the lower St. Johns River. Catches were dominated by killifishes of the estuarine families Poeciliidae, Cyprinodontidae, and Fundulidae, with occasional occurrences of several other marine and estuarine species. With the exception of one species, the fat sleeper (*Dormitator maculatus*), all non-killifish species were represented as juveniles; killifish species, by contrast, were found as both adults and juveniles. The killifish species collected are year-round residents of tidal creeks. Spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), striped mullet (*Mugil cephalus*), and the southern stargazer (*Astroscopus y-graecum*) were represented as young-of-the-year (all less than four months old). The presence of these species demonstrates the dynamic nature of these estuarine tidal creeks as seasonal nursery areas for fish species.

Macroinvertebrate species collected also demonstrate the importance of these tidal creeks as nursery areas. Juvenile white shrimp (*Peneaus setiferus*) and blue crabs (*Callinectes sapidus*) were collected during the survey.

The greatest diversity in terms of the number of different kinds of species collected was found at the reference stations: in particular, stations MPT-B-BIO-1 and MPT-B-BIO-3. The most common species collected were the sailfin molly (*Poecilia latipinna*) and white shrimp.

3.1.4 ZOOPLANKTON AND PHYTOPLANKTON

Table 3-4 contains a list of the zooplankton species collected at each NAVSTA Mayport station, including relative species abundance. Appendix E contains the actual cell counts from subsamples of water column samples collected at each station. Protozoans, rotifers, nematodes, and crustaceans were the major taxa represented in the samples. Numerically, the most abundant species were the ciliate protozoans, the protozoan *Tintinnida* sp. 1, unidentified rotifer species, and unidentified crustacean nauplii species. Station MPT-B-BIO-2 contained the most species because several species of rotifers (*Brachionus* c.f. *havanaensis*, *B. angularis*, *Lepadella* sp., and *Euchlanis* sp.), unidentified cyclopoid species, and *Daphnia* sp. were present.

Table 3-5 contains a list of the phytoplankton species collected at each NAVSTA Mayport station, including relative species abundance. Appendix F contains the actual cell counts from subsamples of water column samples collected at each station. Taxonomically, all major divisions of

Table 3-3. Fish and Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992) (Page 1 of 2)

	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3	MPT-13- BIO-1	MPT-13- BIO-2	MPT-13- BIO-3	MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
FISHES												
Poeciliidae	r		r		r	c			r		c	a
<i>Gambusia holbrooki</i> , eastern mosquitofish												
<i>Poecilia latipinna</i> , sailfin molly	a	r		c	c	c			a	a	c	c
Cyprinodontidae	a	r	r						r	a	c	r
<i>Cyprinodon variegatus</i> , sheephead minnow												
Fundulidae			r									
<i>Fundulus grandis</i> , gulf killifish												
<i>Fundulus heteroclitus</i> , mummichog	a	a	r					r	r			
<i>Fundulus majalis</i> , striped killifish	r		r									
Atherinidae	r		c								c	
<i>Menidia beryllina</i> , inland silverside												
Sciaenidae			r									
<i>Microponogonias undulatus</i> , Atlantic croaker												
<i>Leiostomus xanthurus</i> , spot	r											
Eleotridae									r			
<i>Dormitator maculatus</i> , fat sleeper												

Note: r = rare (1 to 3 individuals).
 c = common (3 to 15 individuals).
 a = abundant (more than 15 individuals).

Table 3-3. Fish and Macroinvertebrates Collected During the Mayport Biological Field Investigation (January 20 Through 23, 1992) (Page 2 of 2)

	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3	MPT-13- BIO-1	MPT-13- BIO-2	MPT-13- BIO-3	MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
Mugilidae <i>Mugil cephalus</i> , striped mullet	r	r	a									
Uranoscopidae <i>Astroscopus y-graecum</i> , southern stargazer			r									
INVERTEBRATES												
Arthropoda Penaeidae <i>Penaeus setiferus</i> , white shrimp	a	a	a	a	a	a	a			a	a	
Portunidae <i>Callinectes sapidus</i> , blue crab	c		r						c		c	
Poronius sp.	r	r										
Mollusca Bivalvia <i>Crassostrea virginica</i> , Eastern oyster			a									

Note: r = rare (1 to 3 individuals).
 c = common (3 to 15 individuals).
 a = abundant (more than 15 individuals).

Table 3-4. Zooplankton Collected During the NAVSTA Mayport Biological Field Investigation (January 20 through 23, 1992) (Page 1 of 2).

	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3	MPT-13- BIO-1	MPT-13- BIO-2	MPT-13- BIO-3	MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
PROTOZOA												
Ciliata unidentified species (app.) [*]	a	c ₁	a	c ₂	a	c ₁	c ₁	a	c ₂	c ₂	c ₂	c ₂
<i>Tintinnida</i> species (sp.) 1	a	r	c ₂	c ₁	c ₁	r	c ₁	c ₂	c ₂	c ₁	c ₂	c ₁
<i>Tintinnida</i> sp. 2				r						r		
<i>Yoricella</i> sp.			c ₁									
ROTIFERA												
unidentified spp. +	c ₂	c ₂	c ₂	c ₂	c ₂	c ₂	c ₂	c ₂	c ₂	c ₂	c ₂	c ₂
<i>Keratella</i> sp.		c ₂	c ₁			r		r	r	r	r	
<i>Polyarthra</i> sp.	r	c ₁	r		r		r	r	r			
<i>Brachionus</i> spp.									r			
<i>Brachionus</i> c.f. <i>plicatilis</i>										r		
<i>Brachionus</i> c.f. <i>havanaensis</i>		r										
<i>Brachionus</i> <i>angularis</i>		r										r
c.f. <i>Notholoca</i> sp.					c ₁	r						
<i>Lepadella</i> sp.		r										
<i>Euchlanis</i> sp.		r										
NEMATODA												
unidentified spp.	r	r	c ₁	r	r	r	c ₂	r	c ₁	c ₁		c ₁
AKTHEROPODA												
Crustacea												
unidentified nauplii spp.**	c ₁	c ₁	c ₁	c ₁	c ₁	c ₁	c ₁	c ₁	c ₁	c ₁	r	c ₂
Copepoda unidentified spp.			r				r			r		c ₁
Calanoida unidentified spp.								r			r	r
Cyclopoida unidentified spp.		r										

Table 3-4. Zooplankton Collected During the NAVSTA Mayport Biological Field Investigation (January 20 through 23, 1992) (Page 2 of 2).

	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3	MPT-13- BIO-1	MPT-13- BIO-2	MPT-13- BIO-3	MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
Cladocera unidentified spp.						r						
Daphnia sp.		r										
Ostracoda unidentified spp.			r									c ₁

- a = abundant (greater than 1,000 cells/ml)
- c₂ = very common (100 to 1,000 cells/ml)
- c₁ = common (10 to 100 cells/ml)
- r = rare (less than 10 cells/ml)
- ! = primarily from the Order Oligotrichida, which includes *Srombidium* and *Halteria*.
- + = some *Conochiloides*, which were not considered separately, as most were in contractile state and a confident identification was not possible.
- ** = Pansoid shrimp and copepod nauplii are similar.

Source: KBN Engineering and Applied Sciences, Inc., 1992.

Table 3-5. Phytoplankton Collected During the NAVSTA Mayport Biological Field Investigation (January 20 through 23, 1992) (Page 1 of 5)

	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3	MPT-13- BIO-1	MPT-13- BIO-2	MPT-13- BIO-3	MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
DIATOMS												
Centric Diatom, 5 micron (μ)	c ₁	c ₁			c ₂	c ₁	c ₁	c ₁	c ₁		c ₂	c ₂
Centric Diatom, 10 μ	c ₂ *	c ₂ *	c ₁ *	a*	c ₂ *	a*	a*	c ₂ *	c ₂ *	c ₁	c ₂ *	a*
Centric Diatom, 15 μ	c ₁	c ₁			c ₁		c ₁ *	c ₁				c ₂
Centric Diatom, 20 μ												c ₁
Centric Diatom, 30 μ	r	r		c ₁	r							r
Centric Diatom, 50 μ												c ₁ *
Centric Diatom, stacked, 10-15 μ							c ₂ *					
Pennate Diatom, <10 μ												
Pennate Diatom, 10-25 μ		c ₁	c ₁ *	c ₁ *	c ₁	c ₂ *	c ₁ *			c ₁ *		
Pennate Diatom, 25-75 μ		c ₂ *		c ₁	c ₁ *	c ₁ *	c ₂ *	c ₁ *				
Pennate Diatom, 75-150 μ							r					c ₁ *
Pennate Diatom, >150 μ		r		r	r			r	r	r	r	r
Pennate Diatom, stacked								r				
<i>Navicula</i> sp., <50 μ	c ₁	c ₁	c ₁	c ₂ *	c ₂		c ₁ *	c ₁ *	c ₂ *	c ₁ *	c ₂ *	r
<i>Navicula</i> sp., >50 μ				r	r		c ₁	r	r	r		
<i>Melosira</i> c.f. <i>nimmoiloides</i>	c ₁		c ₂									
<i>Nitzschia closterium</i>	c ₁		c ₁	c ₁	c ₁	c ₁	c ₂	r	c ₁	c ₁	c ₂	c ₂
<i>Chaetoceros</i> sp.	c ₁			c ₂	c ₁	c ₂	c ₂	c ₁	c ₁	c ₁		
<i>Naviculoides staurinels</i>	c ₁			c ₁	c ₁		c ₂	c ₁	c ₁	c ₁		
<i>Mougeotia</i> sp.	r								r	r		

Note: a = abundant (greater than 1,000 cells/ml)
 c₂ = very common (100 to 1,000 cells/ml)
 c₁ = common (10 to 100 cells/ml)
 r = rare (less than 10 cells/ml)
 * = important because of size/biovolume

phytoplankton are well represented in the samples. Numerically, cyanobacteria and cryptophytes are the most abundant species at most stations. Diatom species represented the most common taxa collected at all stations and represented the most important taxa in size and biovolume. Common diatom taxa included 10 μ centric diatoms, 10 to 15 μ stacked centric diatoms, 10 to 25 μ pennate diatoms, and 25 to 75 μ pennate diatoms. Cryptophytes within the 5 to 15 μ size range were common at all stations.

The cyanobacteria *Anabaena* sp. #2 was found specifically in the patrol road ditch and the ditch east of SWMU 5 (NIRP Site 6). This species was found in relatively high abundance at stations MPT-B-BIO-1, MPT-13-BIO-1, MPT-13-BIO-2, MPT-13-BIO-3 along the patrol road south and west of the golf course; and at stations MPT-2-BIO-4, MPT-2-BIO-5, and MPT-2-BIO-6 east of SWMU 5 (NIRP Site 6) and the eastern dredge spoil area.

Several phytoplankton species represented a more freshwater condition and tended to concentrate around station MPT-2-BIO-2. These species included the diatom c.f. *Amphora* sp.; the cyanobacteria *Oscillatoria* sp.; the green algae c.f. *Chlorella* sp., and the euglenoid *Euglena* sp., which was also found to be common at stations MPT-2-BIO-9, MPT-13-BIO-2, MPT-13-BIO-3, and MPT-B-BIO-2.

3.2 QUANTITATIVE AQUATIC BIOLOGICAL SURVEY

Appendix G contains a complete listing of the species collected in each replicate at each station sampled during the quantitative benthic survey. Table 3-6 contains the biological community parameters used to summarize the data. As stated in Section 3.1.2, the reference stations and station MPT-2-BIO-4 had the greatest number of total taxa and total number of individuals. The distribution of these individuals within taxa reflect as relatively high species diversity values for stations MPT-B-BIO-2 and MPT-2-BIO-4. However, the other reference stations, MPT-B-BIO-1 and MPT-B-BIO-3, have lower diversity values because of the dominance of specific taxa (in terms of number of individuals) at those stations. Station MPT-B-BIO-1 has the lowest diversity value of all stations sampled because of the high dominance (78 percent of the total number of individuals at that station) by a lumbriculid oligochaete. Station MPT-B-BIO-3 has a relatively low species diversity value because of the dominance (51 percent of the total number of individuals at that station) of the corophium amphipod *Corophium lacustre*.

Table 3-6. Biological Community Parameters for Stations Sampled at NAVSTA Mayport During the Quantitative Benthic Survey (January 20 Through 23, 1992)									
Station	Total Taxa	Mean Taxa Per Replicate*	Total No. Individuals	Density (no./m ²)		Shannon-Weaver Diversity Index (\bar{d})	Margelef's Index (D)	Equitability (e)	
				Mean Density	Standard Deviation				
MPT-B-BIO-1	24	14.3	1514	21942	22330	1.44	3.14	0.17	
MPT-B-BIO-2	22	12.7	135	1957	415	3.49	4.28	0.77	
MPT-B-BIO-3	24	12.7	454	6580	8785	2.84	3.76	0.42	
MPT-2-BIO-2	15	7.0	93	1348	883	2.93	3.09	0.73	
MPT-2-BIO-4	32	16.7	418	6058	8184	3.54	5.14	0.53	
MPT-2-BIO-5	14	6.3	59	855	954	2.86	3.19	0.79	
MPT-2-BIO-6	15	8.0	76	1101	708	3.28	3.23	0.93	
MPT-2-BIO-8	11	5.3	62	899	1011	2.49	2.42	0.73	
MPT-2-BIO-9	9	4.3	75	1087	428	2.62	1.85	1.00	

Source: KBN Engineering and Applied Sciences, Inc., 1992.

In general, none of the stations sampled have a high diversity value because of dominance by numbers of individuals within specific taxa. At station MPT-B-BIO-2, the sphaeromatid isopod *Cassidinidea ovalis* comprised 28 percent of the total number of individuals sampled at that station. At station MPT-2-BIO-2, the chironomids *Chironomis* sp. A and *Goeldichironomis holoprasinus* comprised 22 percent and 18 percent, respectively, of the total number of individuals sampled at that station. At station MPT-2-BIO-4, lumbriculid and tubificid oligochaetes and the polychaete *Streblospio benedicti* comprised 24 percent, 17 percent, and 14 percent, respectively, of the total number of individuals sampled at that station. At station MPT-2-BIO-5, the chironomid *Dicrotendipes* sp. comprised 41 percent of the total number of individuals sampled at that station. At station MPT-2-BIO-6, a hesionid polychaete, a hydrobiid gastropod, and a tubificid oligochaete comprised 25 percent, 14 percent, and 13 percent, respectively, of the total number of individuals sampled at that station. At station MPT-2-BIO-8, the ostracod *Haplocytheridea* sp. A and the chironomid *Goeldichironomus holoprasinus* comprised 39 percent and 29 percent, respectively, of the total number of individuals sampled at that station. At station MPT-2-BIO-9, *Goeldichironomus holoprasinus*, the psychodidae *Telmatoscopus superbus*, and *Chironomus* sp. A comprised 25 percent, 20 percent, and 15 percent, respectively, of the total number of individuals sampled at that station.

Margelef's Index of Species Richness (D) tends to further demonstrate the levels of dominance at individual stations, as described above. The equitability index (e), however, is useful in determining the relative "stability" of a station assemblage by demonstrating the distribution of individuals within taxa within a community. This index is the ratio of the number of species actually sampled to the expected number of species at the station (i.e., a community that conforms to the MacArthur broken stick model). The index has a range of values from 0 to 1 with 1 being a community equitable with expected values. In general, if the equitability index is below 0.5, the community is typically dominated by a specific taxa and considered unstable. All stations except reference stations MPT-B-BIO-1 and MPT-B-BIO-3 were above 0.5. Station MPT-B-BIO-1, a reference station, had the lowest equitability index value and, as presented above, has high dominance.

Table 3-7 presents the community loss index values for all stations compared to the reference stations. A low community index value indicates a relatively high number of similar taxa in the two communities (station assemblages) being compared; conversely, a high value indicates a low number of similar taxa. The reference stations are relatively comparable to one another with

Table 3-7. Community Loss Index Values for All Stations Sampled at NAVSTA Mayport During the Quantitative Benthic Survey.

Station	MPT-B- BIO-1	MPT-B- BIO-2	MPT-B- BIO-3	MPT-2- BIO-2	MPT-2- BIO-4	MPT-2- BIO-5	MPT-2- BIO-6	MPT-2- BIO-8	MPT-2- BIO-9
MPT-B-BIO-1	---	0.68	0.62	1.53	0.31	1.21	1.20	1.73	2.40
MPT-B-BIO-2	0.62	---	0.46	1.27	0.34	1.07	0.93	1.54	2.00
MPT-B-BIO-3	0.54	0.59	---	1.60	0.41	1.50	1.47	2.00	2.56

Source: KBN Engineering and Applied Sciences, Inc., 1992

community loss index values between 0.46 and 0.68. Station MPT-2-BIO-4 was the only station with relatively low index values compared with the reference stations. Index values for station MPT-2-BIO-4 compared to stations MPT-B-BIO-1, MPT-B-BIO-2, and MPT-B-BIO-3 were 0.31, 0.34, and 0.41, respectively. All other stations had relatively high community loss index values.

Table 3-8 presents the percent contribution of total taxa within phyla collected at each station. As has been described above, annelid and arthropod taxa dominate the stations.

3.3 TERRESTRIAL SURVEYS

The terrestrial field surveys conducted as part of this project were limited to one field day, and the objective was to make basic field observations and verify the previous field study conducted in 1986 (ESE, 1986).

No undisturbed ecosystems or vegetation communities exist on or near the sites. No plants listed as endangered, threatened, or as species of special concern were discovered during the field survey, nor were any suitable habitats seen. Major habitat types on and adjacent to the sites consist of developed and ruderal areas, freshwater wetlands, cabbage palm hammocks, pine woodlands, and a coastal marsh. The habitat locations are shown in relation to the SWMUs in Figure 2.

Wildlife species listed as endangered or potentially endangered and observed on or near the sites are shown in Table 3-9. According to records maintained by FGFWFC, no known eagle nests or wading bird rookeries are located on NAVSTA Mayport. Wood storks were observed in grassy areas near SWMU 5 (NIRP Site 6). Other wading birds listed in Table 3-9 were observed foraging in ditches and in standing water immediately off-site near SWMUs 2, 3, 4, or 5 (NIRP Sites 2, 4, 5, or 6). Use of wetlands by these species, and by other wading birds, is common to the region.

Although not observed during the survey, other wildlife species listed as endangered or potentially endangered may utilize the sites. As noted in the IAS, these species include the American alligator (*Alligator mississippiensis*), bald eagle (*Haliaeetus leucocephalis*), Southeastern kestrel (*Falco sparverius paulus*), and arctic peregrine falcon (*Falco peregrinus tundrius*) (ESE, 1986). The arctic peregrine falcon is found in Florida only as a migrating winter resident. Kestrels were observed foraging on SWMUs 4 and 5 (NIRP Sites 5 and 6), but it could not be determined

Table 3-8. Percent Contribution of Total Taxa Within Phyla Sampled at All Stations at NAVSTA Mayport During the Quantitative Benthic Survey.

Station	Phylum		
	Annelida	Mollusca	Arthropoda
MPT-B-BIO-1	41.6	8.3	50.0
MPT-B-BIO-2	27.2	13.6	59.0
MPT-B-BIO-3	33.3	0	62.5
MPT-2-BIO-2	20.0	6.6	73.3
MPT-2-BIO-4	50.0	9.3	40.6
MPT-2-BIO-5	28.5	14.2	57.1
MPT-2-BIO-6	40.0	26.6	33.3
MPT-2-BIO-8	9.0	18.1	72.7
MPT-2-BIO-9	33.3	0	66.6

Source: KBN Engineering and Applied Sciences, Inc., 1992

Table 3-9. Endangered or potentially endangered wildlife species observed on or near SWMU 2, 3, 4, and 5 (NIRP sites 2, 4, 5, and 6) NAVSTA Mayport (January 1992)

Common Name	Scientific Name	Designated Status	
		FGFWFC	USFWS
Wood stork	<i>Mycteria americana</i>	E	E
Tricolored heron	<i>Egretta tricolor</i>	SSC	-
Little blue heron	<i>Egretta caerulea</i>	SSC	-
Snowy egret	<i>Egretta thula</i>	SSC	-

Note: E = Endangered.
 SSC = Species of special concern.
 - = Not listed by Agency.
 FGFWFC = Florida Game and Fresh Water Fish Commission
 USFWS = U.S. Fish and Wildlife Service

Source: KBN Engineering and Applied Sciences, Inc., 1992.

whether they were the threatened Southeastern subspecies or the migratory non-listed subspecies that winters in Florida. Results of the field survey indicate that the information provided in the 1986 IAS regarding endangered, threatened, and rare wildlife species that occur or may have suitable habitat at NAVSTA Mayport is correct.

Overall, the sites and adjacent land consist primarily of developed and disturbed areas. Due to the ruderal nature of the sites, wildlife species that utilize the areas are generally those species that are associated with urban areas and human disturbance. Species common to these areas are those listed in the 1986 IAS, and include species such as the raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), skunk (*Mephitis mephitis*), gray squirrel (*Sciurus carolinensis*), rabbit (*Sylvilagus floridanus*), shrews, bats, and a variety of reptiles, rodents and birds. Many species of waterfowl and wading birds utilize the wetlands (particularly the drainage ditches and dredge spoil area) area for foraging, or temporarily during migration.

The 1986 IAS provided locations of habitats at NAVSTA Mayport (Figure 4-4, ESE, 1986). Although the locations of habitats in the IAS were somewhat imprecise, the locations of the pine flatwoods and coastal marsh near SWMUs 2, 3, 4, and 5 (NIRP Sites 2, 4, 5, and 6) appear to be correct, with the following exceptions: the coastal marsh at the southeastern end of SWMU 5 (NIRP Site 6) actually extends into the NAVSTA site; and the freshwater wetlands on SWMUs 2, 3, and 5 (NIRP Sites 2, 4, and 6) are not shown on Figure 4-4 of the IAS (ESE, 1986).

3.4 WETLAND SURVEYS

The objective of the wetland surveys was not to delineate the wetlands but to identify and characterize them. SWMUs 2, 3, 4, 5, and 13 (NIRP Sites 2, 4, 5, 6, and 13) were surveyed for wetlands. The following is a description of each site. The areal extent of on-site and nearby wetlands are shown on Figure 2.

SWMU 2 (NIRP Site 2)--This site is completely covered by asphalt pavement and has a building on the west end. The vegetation, which is between the fence and the pavement, is minimal within the site. The only wetland on this site is at the extreme west end. The area considered a wetland extends north and south and is between the pavement and the fence. This wetland is considered a weedy ditch bank. Immediately west of the fence is a ditch. Vegetation found on this site is summarized in Appendix H, Table H-1, and the wetlands are shown on Figure 2. The dominant

vegetation on this site is seashore paspalum and bermuda grass. This area would be classified as a mowed turf.

SWMU 3 (NIRP Site 4)--This site consists of a roadside, a portion of a levee and a filled area behind the levee. A sabal palm hammock dominated by sabal palms, slash pines and southern red cedars is immediately east of the site. The roadsides on the north and west sides are bordered by weedy ditches, which are wetlands. The levee itself is not a wetland, but the filled area within the levee is a weedy transitional freshwater wetland. Vegetation found on this site is summarized in Appendix H, Table H-2, and the wetlands are shown on Figure 2. The dominant vegetation found on this site is marsh elder, bushy broom grass, Bermuda grass, blue maidencane, and sharp-pod morning glory. This vegetation type would classify this area as an old field. However, the site is obviously disturbed and filled and should be designated as a disturbed site.

SWMU 4 (NIRP Site 5)--This site is extremely weedy. There is a grove of young pines on the north end and a high mound of soil just north of the center. No portion of this site is considered a wetland. Vegetation found on the site is summarized in Appendix H, Table H-3. The dominant vegetation on this site is slash pine, groundsel bush, southern sandspur, camphor weed, crowfoot grass, Bermuda grass, and white sweet clover. This site is considered a weedy old field.

SWMU 5 (NIRP Site 6)--This site has various vegetation types. The southeastern portion is a coastal marsh and the north end is a freshwater marsh. An additional freshwater marsh system is located in the southwestern portion on both sides of the berm. A vehicle storage facility is located in the eastern portion of the SWMU.

Due to several plant associations, a large number of plant species are present.

Several plant associations are found on this site.

1. Coastal Marsh--dominated by sea oxeye, perennial glasswort, salt grass, marsh elder, christmas berry, saltmarsh cord grass, and black needle rush.
2. Freshwater Marsh--dominated by coastal plain willow, seashore paspalum, seaside goldenrod, hair grass, southern cat-tail, seashore dropseed, and elderberry.
3. Cabbage Palm Hammocks (two separate hammocks)--dominated by cabbage palm.
4. Planted Pines--dominated by slash pine and wax myrtle.

5. Mowed Field—dominated by cranesbill, black medic, common dandelion, common chickweed, and seashore parpelum.
6. Old Field—dominated by common beggar's-tick, pennywort, Bermuda grass, match-head, camphor weed, southern dewberry, maypop, and sharp-pod morning-glory.

Vegetation found on this site is summarized in Appendix H, Table H-4, and the wetlands are shown on Figure 2.

SWMU 13 (NIRP Site 13)--This area is covered by asphalt and buildings. The areas with vegetation are quite limited and are considered as lawns. There are no wetlands present. The dominant vegetation is Bermuda grass and St. Augustine grass. This limited area of vegetation consists of mowed turf. Vegetation found on this site is summarized in Appendix H, Table H-5.

4.0 SUMMARY

4.1 AQUATIC SYSTEMS

All stations sampled are tidally connected to Chicopit Bay and the Intracoastal Waterway either directly or via Sherman Creek and Pablo Creek. All of the project area stations and one reference station, MPT-B-BIO-1, were located in drainage ditches on NAVSTA Mayport. The stations receive surface water drainage from nearby areas. Two reference stations are located on tributaries on the south side of Sherman Creek. All stations are variably influenced by tidal action and surface water runoff.

The reference stations and station MPT-2-BIO-4 had the greatest number of benthic macroinvertebrate species (see Table 3-2). These stations had the greatest representation of marine or estuarine benthic macroinvertebrates (mainly polychaetes and amphipods). The most abundant macroinvertebrate species at the remaining stations were oligochaetes and chironomids, which are more representative of freshwater systems than marine or estuarine systems. This situation is due to the fact that most of the stations within NAVSTA Mayport are influenced by surface water runoff from the base.

The fish and macroinvertebrate communities were typical of estuarine tidal creeks of the lower St. Johns River. Fish catches were dominated by killifishes. The presence of juvenile fish and macroinvertebrates demonstrates the dynamic nature of these tidal creeks as nursery areas for these species.

Protozoans, rotifers, nematodes, and crustaceans were the major zooplankton taxa represented at the stations. Numerically, the most abundant species included ciliate protozoans, rotifers, and crustacean nauplii. Taxonomically, all major divisions of phytoplankton species are well represented at the stations. Numerically, cyanobacteria and cryptophytes are the most abundant species at most stations.

In general, none of the stations sampled had a high benthic macroinvertebrate diversity value due to the dominance by specific taxa. The community loss index values indicate that the reference stations contain a comparable (similar) species complement. The species collected at station MPT-2-BIO-4 are similar to the species sampled at the reference stations. The reason for this similarity is not clear; however, Station MPT-2-BIO-4 did not receive a point source discharge

possibly making it less influenced by surface water discharges. All other stations contained few species similar to the reference stations. Most of these stations received surface water runoff from point sources (i.e., pipes or culverts).

4.2 WILDLIFE

Wildlife species that utilize the areas are generally those species that are associated with urban areas and are tolerant of human disturbance. These species were identified in the IAS (ESE, 1986) and are confirmed by this survey.

4.3 WETLANDS

No undisturbed wetlands were observed at NAVSTA Mayport during the January 1992 biological surveys. A "disturbed" ecosystem, vegetation community, or wetland is one where the vegetation and/or topsoil have been altered by human activity. The small wetland on SWMU 2 (NIRP Site 2) consists of a ditch. The wetlands at SWMU 3 (NIRP Site 4) consist of ditches and a filled, obviously disturbed area atop dredge soil. Two disturbed freshwater marshes are located at SWMU 5 (NIRP Site 6). Also at SWMU 5 is a small, disturbed portion of a large coastal salt marsh. This marsh extends off the site to the southeast. The off-site portion of this marsh appears to be of considerable quality in terms of observed wildlife.

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APPENDIX A
SAMPLING SCHEDULE

Appendix A. Field activities during the aquatic biological sampling at NAVSTA Mayport, Florida		
DATE	TIME	ACTIVITY
20 January 1992	1300 - 1500	sample MPT-B-BIO-3
	1500 - 1700	sample MPT-B-BIO-2
21 January 1992	0730 - 0900	sample MPT-13-BIO-1
	0900 - 1000	sample MPT-13-BIO-2
	1000 - 1100	sample MPT-13-BIO-3
	1200 - 1400	sample MPT-2-BIO-8
	1400 - 1600	sample MPT-2-BIO-9
	1600 - 1800	sample MPT-2-BIO-2
22 January 1992	0800 - 0900	sample MPT-2-BIO-6
	0900 - 1000	sample MPT-2-BIO-5
	1000 - 1100	sample MPT-2-BIO-4
	1100 - 1200	sample MPT-B-BIO-1 water quality phyto/zooplankton benthos
	1500 - 1700	sample MPT-B-BIO-1 fish/macro- invertebrates

Source: KBN Engineering and Applied Sciences, Inc., 1992.

APPENDIX B

TIDAL DATA

Appendix B. Times and heights of tide at Mayport, Florida during the aquatic biology sampling period.		
DATE	TIME	HEIGHT feet (centimeters)
20 January 1992	0202	-1.3 (-40)
	0849	5.3 (162)
	1446	-1.2 (-37)
	2110	4.6 (140)
21 January 1992	0257	-1.3 (-40)
	0940	5.3 (162)
	1537	-1.2 (-37)
	2203	4.7 (143)
22 January 1992	0352	-1.2 (-37)
	1030	5.1 (155)
	1625	-1.2 (-37)
	2255	4.7 (143)

Source: KBN Engineering and Applied Sciences, Inc., 1992.
U.S. Department of Commerce, 1991.

APPENDIX C
KBN QAPP SECTION 9.0

9.0 CALIBRATION PROCEDURES AND FREQUENCY

9.1 FIELD SAMPLING EQUIPMENT

All field equipment to be used during field investigations where environmental samples (i.e. groundwater, soil, sediment, or surface water) are to be collected for analysis will be calibrated prior to use in the field. The calibration procedures will follow manufacturer's instructions for the model of equipment being used to assure that the equipment is functioning within the tolerances established by the manufacturer and required by the project. A copy of all instrument manuals will be placed in a three-ring notebook and brought to the field by the Field Team Leader. A record of the instrument calibration will be maintained in the field notebook and will be subject to audit by the Project QA Supervisor.

Field instruments which may be used during investigations requiring environmental sampling include, but are not limited to, the following equipment:

1. OVA equipped with a Photoionization Detector (PID);
2. OVA equipped with a Flame Ionization Detector (FID);
3. Total Ionization Probe (TIP) PID;
4. Hydrolab Surveyor II Water Quality Monitor;
5. YSI Model No. 3560 Water Quality Monitoring System;
6. Enviro-Lab EL-200/System 17 Data Logger;
7. Insitu Model No. SE1000 Data Logger; and
8. Electronic Water Level Meter.

The manufacturers' specifications will be followed during the calibration of these instruments and others used during remedial investigations. A more specific description of the calibration procedures for the most commonly used field instruments is provided below.

9.1.1 pH

The pH meter calibration is performed at the start of each sampling day using National Bureau of Standards (NBS) - traceable standard buffer solutions which bracket the pH range expected in the samples. Calibration knobs are used to set the meter to read the value of the standard. The meter is then checked during the sampling period, using at least one standard, at a frequency which results in little or no calibration adjustment. If the reading varies more than one-tenth of a unit between calibration checks, the frequency of the checks will be increased. The meter will be

checked at the end of each sampling day to determine deviation from the initial calibration, and this information will be recorded in the field notebook.

The pH meter is incorporated into the Hydrolab Surveyor II, utilizing automatic temperature compensation. Calibration is accomplished with commercially prepared standards as follows:

1. Flush calibration cup and sensors with deionized water. Secure the sonde cup pointed in upright position;
2. Fill cup with 7.0 buffer sufficient to cover the membrane of the DO sensor;
3. Allow 1 to 2 minutes for thermal equilibration;
4. Switch instrument to pH and use the zero control to set display value to 7.0;
5. Pour out the 7.0 buffer and flush the sensors with deionized water;
6. Fill cup with 4.0 or 10.0 solution (depending on target range) and allow 1 to 2 minutes for thermal equilibration;
7. Use slope control to adjust display reading to 4.0 (or 10.0, depending on target range);
8. Pour out the 4.0 (or 10.0, depending on target range) solution and flush the sensors with deionized solution;
9. Fill cup with 7.0 solution and record reading; and
10. If final reading varies, repeat steps 3 through 9.

9.1.2 CONDUCTIVITY

Calibration of the conductivity meter will be performed at the start of each sampling day using potassium chloride (KCl) standard solutions prepared by the subcontracted laboratory. Standard solutions will be in the range of expected water conductivities to be measured. The analyst preparing the solutions will verify the standard with a laboratory conductivity bridge. The level of the standards will be selected to bracket the range of values expected in the samples.

The conductivity mechanism used in field procedures is incorporated into the Hydrolab Surveyor II. The unit is automatically temperature compensated. Commercially prepared KCl solutions will be utilized during the following calibration procedures:

1. Prepare the standard KCl solution at the top or the conductivity range of measurements;
2. Rinse the sensors and cup several times with deionized water;

3. Fill the calibration cup two-thirds full with conductivity standard; cover cup and shake the sonde;
4. Discard standard and repeat Step 3;
5. Place sonde unit in upright position and fill to within 1 cm of the top of the cup with standard, making sure no bubbles are trapped in chamber or sensor;
6. Switch unit to temperature, ensuring temperature is stable; and
7. Switch unit to conductivity, use slope control to adjust reading to standard value.

The meter must read within 10 percent of the standard value. The meter is then checked during the sampling period, using at least one standard, at a frequency which results in little or no calibration adjustment. The meter will be checked at the end of each sampling day to determine deviation from the initial calibration, and this information will be recorded in the field notebook.

9.1.3 TEMPERATURE

The temperature mechanism used in field procedures is incorporated into the Hydrolab Surveyor II. There is no way to calibrate the temperature in the field; however, the temperature will be checked with a field grade or NIST (NBS) certified thermometer daily and before use. Field grade thermometers will be calibrated annually to an NIST (NBS) certified thermometer and recorded in permanent records. The reading will be checked at least once per field trip using a quality-grade thermometer.

9.1.4 DISSOLVED OXYGEN

The conductivity mechanism used in field procedures is incorporated into the Hydrolab Surveyor II. Annual calibration will be against winkler titration. Daily calibration is performed by saturated air as follows:

1. Fill the upright calibration cup with deionized water so the tip of the DO sensor is submerged approximately 1 cm;
2. Seal the end of the cup with soft cover and shake gently for approximately 15 seconds;
3. Switch unit to temperature reading and observe for fluctuations. If the temperature fluctuates by more than one-tenth of a degree in 5 seconds, repeat step 2;
4. When temperature is stable, remove soft cover and enough water so that the tip of DO sensor is approximately 0.5 cm above water;
5. Carefully blot the water off the DO membrane with paper wipe;

6. Place the hard cap upside down on the cup to minimize air currents;
7. Wait 5 minutes and record local barometric pressure with mercury barometer in units of millimeters or torr;
8. Read temperature and match corresponding DO from chart with temperature and barometric pressure; and
9. Switch to DO and adjust slope to read proper DO.

9.1.5 ORGANIC VAPOR ANALYZER METERS

Calibration of OVA meters will be performed at the start of each day of instrument use in accordance with procedures indicated by the instrument manufacturer. Additional calibration activities will be conducted if the meter experiences abnormal perturbations or if the readings become erratic. Calibration of the OVA will include the use of zero gas and span gas of content and concentration as specified by the instrument manufacturer. Results of calibration conducted on the meters will be recorded in the field notebook.

Readings conducted with an OVA in ambient air will include a correction for background response. Readings conducted with an OVA to screen soil sample container headspace under foil will not require background correction. Screening of soil samples for excessive petroleum contamination will be conducted in accordance with the procedures presented in Section 8.2 of this document.

The use of an OVA equipped with a flame ionization detector (FID) to screen for volatile organic hydrocarbon (VOH) compounds will include successive readings with and without an activated carbon filter. The use of the carbon filter is to distinguish the occurrence of methane in highly organic silty soils from VOH compounds.

In accordance with the requirements of Chapter 17-770.200(2), FAC, the use of a photoionization detector (PID) to screen for excessively contaminated soils will be conducted under conditions that produce a response equivalent to a FID. The Thermo Environmental Instruments Inc. (TEI) Model 580B OVM PID used by KBN personnel will be calibrated in accordance with the procedures presented in the memorandum titled "Effective Field Screening of Gasoline and Diesel Excessively Contaminated Soils Using the Thermo Environmental Instruments Inc. 580 Series Portable Organic Vapor Meter." The use of the Model 580B OVM following calibration with the procedures and response factors included in this memorandum was indicated by the FDER to

adequately correspond to FID readings for gasoline and diesel component contamination of soil (correspondence from Mr. Daniel W. Kraft, FDER, dated June 26, 1991).

9.1.6 AUTOMATIC SAMPLERS

The procedures outlined in this section will be used to maintain and calibrate automatic samplers to ensure proper operation of the equipment and collection of representative samples. Differences from these prescribed procedures will be documented in a bound field notebook. Prior to each field trip, the sampler operation will be checked. This includes operation (forward, reverse, automatic) through three cycles of purge-pump-purge; checking desiccant for replacement as necessary; checking 12-volt batteries to be used with the sampler; and repairing or replacing malfunctioning part as necessary. The pumping rate at multiple heads, the timing mechanisms, the multiplexer, or the flow pacer will be checked against the manufacturer's specifications and documented whenever one or more of these functions appears to be operating improperly. Malfunctioning equipment which cannot be repaired will be sent to the manufacturer for adjustment; repairs conducted by KBN personnel or the manufacturer will be documented.

During each field trip, prior to initiating sampling, the purge-pump-purge cycle shall be checked at least once for proper operation. The constant pumping volume using a graduated cylinder or other volumetrically calibrated container will be checked at least twice, and the flow pacer that activates the sampler shall be checked for proper operation.

9.2 LABORATORY ANALYTICAL EQUIPMENT

The calibration procedures and frequency procedures regarding instrumentation listing, standard solution receipt and traceability, standard solution sources and preparation, instrument calibration, and standardization of titration solutions will be described in the approved QAP prepared by the subcontracted laboratory. This information is specific to the individual laboratory selected for use.

APPENDIX D
FORMULAS FOR BENTHIC INDICES

FORMULAS FOR INDICES

Shannon-Weaver Index (\bar{d}) (Shannon and Weaver, 1963) of species diversity was calculated as:

$$\bar{d} = C/N (N \log_{10} N \sum n_i \log_{10} n_i) \quad (\text{Lloyd et al., 1968})$$

where: $C = 3.321928$ (converts base 10 log to base 2 [bits]),
 N = total number of individuals, and
 n_i = total number of individuals in the i^{th} species.

Shannon-Weiner Index (H') (Pielou, 1969) (Appendix G) was calculated as:

$$H' = -\sum p_i \log_e p_i$$

where: $p_i = n_i/N$ (the proportion of the total number of individuals in the i^{th} species),
 n_i = number of individuals, and
 N = total number of individuals.

Pielou's Evenness Index (J') (Pielou, 1966) (Appendix G) was calculated as:

$$J' = H' / \log_2 S \quad (\text{or } H' / H_{\max})$$

where: H' = Shannon-Weiner Index, and
 S = total number of species (in all samples in the community).

Margelef's Index of Species Richness (D) (Margelef, 1961) was calculated as:

$$D = (S-1) / \log N$$

where: S = number of taxa, and
 N = total number of individuals.

The equitability index (e) (Lloyd and Ghelardi, 1964) was calculated as:

$$e = s'/s$$

where: s = number of taxa in the sample, and
 s' = number of taxa expected from a community that conforms to MacArthur's (1957) broken stick model.

The Community Loss Index (Courtemanch and Davies, 1987) was calculated as:

$$\text{Community Loss Index (I)} = (a-c)/b$$

where: a = number of taxa present in reference stations,
 c = number of taxa common to both samples, and
 b = number of taxa present in station of comparison.

APPENDIX E
ZOOPLANKTON DATA

'Zooplankton' remaining on 40µ mesh cloth (#/liter).

category	MPT-2 BIO-2	MPT-2 BIO-4	MPT-2 BIO-5	MPT-2 BIO-6	MPT-2 BIO-8	MPT-2 BIO-9
Protozoa						
ciliates						
misc. ¹	20	12312	718	580	648	104
tintinnid 1	40	430	104	18	124	84
tintinnid 2					1096	78
vorticellids				4		
Rotifera						
misc.-no ID	172	646 ²	114	126	144	232
Keratella		2	2	2	4	
Polyarthra		2	4			
Brachionus						
spp			6			
cf plicatilis				6		
cf havanaensis						
angularis						
cf Notholoca						2
Lepadella						
Euchlanis						
nematodes	220	4	12	12		34
Crustaceans						
nauplii ³	60	90	54	12	8	144
copepodids	4		4	2		14
calanoids		2			4	4
cyclopoids						
misc. no ID						
cladocerans						
Daphnia						
ostracods						14

'Zooplankton' remaining on 40 μ mesh cloth (#/liter).

category	MPT-13 BIO-1	MPT-13 BIO-2	MPT-13 BIO-3	MPT-B BIO-1	MPT-B BIO-2	MPT-B BIO-3
Protozoa						
ciliates						
misc. ¹	257	1454	24	3990	96	1114
tintinnid 1	60	96	4	1590	4	352
tintinnid 2	4					
vorticellids						20
Rotifera						
misc.-no ID	144	202	112	298	520	116
Keratella			4		102	12
Polyarthra		2		8	10	4
Brachionus						
spp						
plicatilis						
havanaensis					2	
angularis					2	
cf Notholoca		20	8			
Lepadella					4	
Euchlanis					2	
nematodes	8	6	8	6	2	62
Crustaceans						
nauplii ³	52	16	36	72	20	40
copepodids						2
calanoids						
cyclopoids					4	
misc. no ID	4		4			2
cladocerans			8			
Daphnia					2	
ostracods						2

Footnotes:

¹ primarily from Order Oligotrichida, which includes Strombidium and Halteria.

² some Conochiloides. These were not enumerated separately as most were in such a contractile state that a confident identification could not be made.

³ Penaeid shrimp nauplii are very similar to copepod nauplii. Separation of the two would require time intensive detail work. I would conjecture that most, if not all, were copepod nauplii due to the presence of copepodids and adult copepods.

APPENDIX F
PHYTOPLANKTON DATA

MPTB-BIO-1

Species	Division	Cell Count Cells/ml
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	19319.8
Anabaena #2	Cyanobacteria	2023.4 *
Cryptophyte, 5-15 microns	Cryptophyte	1389.2 *
Microcystis, 1-2 microns	Cyanobacteria	498.3
Merismopedia tenuissima	Cyanobacteria	483.2
Centric Diatom, 10 micron	Diatom	407.7 *
Crucigenia tetrapedia	Green	302.0
Raphidiopsis	Cyanobacteria	226.5
Ankistrodesmus convolutus	Green	166.1
Anabaenopsis	Cyanobacteria	120.8
Ankistrodesmus nannoselene	Green	90.6
Navicula	Diatom	75.5
Melosira c.f. nummuloides	Diatom	60.4
Scenedesmus #1	Green	60.4
Tetrastrum heteracanthum	Green	60.4
Green #1	Green	60.4
Scenedesmus bicaudata	Green	60.4
Tetrastrum	Green	60.4
Lyngbya limnetica	Cyanobacteria	45.3
Centric Diatom, 5 micron	Diatom	45.3
Centric Diatom, 15 micron	Diatom	45.3
Scenedesmus quadricata	Green	30.2
Chlamydomonas	Green	30.2
Oscillatoria	Cyanobacteria	15.1
Nitzschia closterium	Diatom	15.1
Chaetoceros	Diatom	15.1
Naviculodes staurineis	Diatom	15.1
Tetraedron minimum	Green	15.1
Golenkinia	Green	15.1
Ankistrodesmus falcatus	Green	15.1
Coelastrum reticulatum	Green	0.8
Mougeotia	Diatom	0.8
Pleurosigma/Gyrosigma	Diatom	0.3
Euglena	Euglena	0.2
Centric Diatom, 30 micron	Diatom	0.1
	TOTAL	25769.7

MPTB-B10-2

Species	Division	Cell Count Cells/ml
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	28298.4
<i>Merismopedia tenuissima</i>	Cyanobacteria	18844.8
<i>Microcystis</i> , 1-2 microns	Cyanobacteria	16332.1
<i>Raphidiopsis</i>	Cyanobacteria	5662.5
<i>Lyngbya limnetica</i>	Cyanobacteria	1072.1
Centric Diatom, 10 micron	Diatom	286.9 *
<i>Ankistrodesmus convolutus</i>	Green	271.8
Cryptophyte, 5-10 microns	Cryptophyte	211.4 *
<i>Tetraedron minimum</i>	Green	196.3
<i>Scenedesmus quadricata</i>	Green	181.2
Pennate Diatom, 25-75 microns	Diatom	135.9 *
<i>Crucigenia tetrapedia</i>	Green	120.8
<i>Ankistrodesmus nannosolene</i>	Green	105.7
<i>Chlorogonium</i>	Green	105.7
<i>Merismopedia</i> , 2 micron	Cyanobacteria	90.6
Centric Diatom, 5 micron	Diatom	90.6
<i>Melosira</i> c.f. <i>nummuloides</i>	Diatom	90.6
<i>Ankistrodesmus falcatus</i>	Green	90.6
<i>Schroederia</i>	Green	90.6
Cryptophyte, >15 microns	Cryptophyte	60.4 *
<i>Dictyosphaerium ehrenbergianum</i>	Green	60.4
<i>Scenedesmus abundans</i>	Green	60.4
<i>Scenedesmus bicaudata</i>	Green	60.4
<i>Crucigenia crucifera</i>	Green	60.4
<i>Planktomyces</i>	Bacteria	30.2
<i>Oscillatoria</i> #1	Cyanobacteria	30.2
Centric Diatom, 15 micron	Diatom	30.2
Pennate Diatom, 10-25 microns	Diatom	30.2
<i>Treubaria setigerum</i>	Green	30.2
<i>Chlamydomonas</i>	Green	30.2
<i>Oscillatoria</i> #1	Cyanobacteria	15.1
Dinoflagellates, armoured	Dinoflagellate	15.1
<i>Golenkinia</i>	Green	15.1
<i>Tetraedron lunula</i>	Green	15.1
<i>Tetraedron muticum</i>	Green	15.1
<i>Euglena</i>	Euglena	10.4
<i>Anabaenopsis</i>	Cyanobacteria	1.2
<i>Nitzschia</i>	Diatom	0.9
<i>Pediastrum duplex</i> no var.	Green	0.8
Pennate Diatom, >150 microns	Diatom	0.4
<i>Pleurosigma/Gyrosigma</i>	Diatom	0.1
Centric Diatom, 50 micron	Diatom	0.1
<i>Ceratium</i>	Dinoflagellate	0.1
<i>Closterium</i>	Green	0.1
	TOTAL	72851.4

MPT2-B10-2

Species	Division	Cell Count Cells/ml
Single Celled Cyanobacteria	Cyanobacteria	26847.2
Chlorella c.f.	Green	7320.5 *
Centric Diatom, 10 micron	Diatom	4575.3 *
Ankistrodesmus nannoselene	Green	3050.2
Euglena	Euglena	2567.0 *
Cryptophyte, 5-15 microns	Cryptophyte	694.6 *
Chaetoceros	Diatom	573.8
Lyngbya limnetica	Cyanobacteria	483.2
Naviculodes staurineis	Diatom	483.2
Pennate Diatom, 25-75	Diatom	422.8 *
Nitzschia closterium	Diatom	211.4
Ankistrodesmus convolutus	Green	181.2
Cryptophyte, >15 microns	Cryptophyte	151.0 *
Amphora c.f.	Diatom	151.0
Amphora, 25 micron	Diatom	151.0 *
Centric Diatom, stacked, 5-15 microns	Diatom	120.8 *
Centric Diatom, 15 micron	Diatom	90.6 *
Navicula, <50 microns	Diatom	90.6 *
Oscillatoria #1	Cyanobacteria	90.6
Pennate Diatom, 10-25 microns	Diatom	60.4 *
Centric Diatom, 5 micron	Diatom	60.4
Diploneis	Diatom	30.2
Amphora, >25 microns	Diatom	30.2
Oscillatoria #2	Green	30.2
Navicula, >50 microns	Diatom	14.8
Oscillatoria, >100 microns	Green	13.0 *
Closterium	Green	1.2
Pennate, 75-150 microns	Diatom	0.4
Pleurosigma/Gyrosigma	Diatom	0.2
Closterium	Green	0.2
	TOTAL	48497.2

MPTB-BIO-3

Species	Division	Cell Count Cells/ml
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	37459.1
Cryptophyte, 5-15 microns	Cryptophyte	1326.0 *
Microcystis, 1-2 microns	Cyanobacteria	1092.0
Thalassiosira	Diatom	546.0
Lyngbya limnetica	Cyanobacteria	507.0
Scenedesmus quadricata	Green	182.0
Merismopedia tenuissima	Cyanobacteria	104.0
Melosira	Diatom	104.0
Crucigenia tetrapedia	Green	104.0
Scenedesmus quadricata var alternans	Green	104.0
Raphidiopsis	Cyanobacteria	78.0
Centric Diatom, 10 micron	Diatom	78.0 *
Pennate Diatom, 10-25 microns	Diatom	65.0 *
Ankistrodesmus convolutus	Green	65.0
Centric Diatom, stacked, 10-15 microns	Diatom	52.0 *
Scenedesmus bijuga	Green	52.0
Chlamydomonas	Green	52.0
Tetrastrum heteracanthum	Green	52.0
Lyngbya contorta	Cyanobacteria	26.0
Navicula	Diatom	26.0
Diploneis	Diatom	26.0
Scenedesmus bicaudata	Green	26.0
Schroederia	Green	26.0
Cryptophyte, >15 microns	Cryptophyte	13.0
Oscillatoria #2	Cyanobacteria	13.0
Nitzschia c.f. closterium	Diatom	13.0
Pennate Diatom, <10 microns	Diatom	13.0
Chodatella	Green	13.0
Ankistrodesmus nanoselene	Green	13.0
Nitzschia	Diatom	1.5
Pleurosigma/Gyrosigma	Diatom	0.2
Centric, 50 micron	Diatom	0.1
Surirella	Diatom	0.1
Closterium	Green	0.1
	TOTAL	42232.1

MPT2-BIO-4

Species	Division	Cell Count cells/ml
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	28117.0
Anabaena #2	Cyanobacteria	6085.3 *
Cryptophyte, 5-15 microns	Cryptophyte	2292.7 *
Scenedesmus quadricata	Green	1162.7
Ankistrodesmus nannoselene	Green	694.6
Centric Diatom, 10 micron	Diatom	649.3 *
Raphidiopsis	Cyanobacteria	498.3
Merismopedia tenuissima	Cyanobacteria	241.6
Pediastrum tetras	Green	241.6
Cryptophyte, >15 microns	Cryptophyte	211.4 *
Scenedesmus bijuga	Green	181.2
Chlorella	Green	181.2
Chlamydomonas	Green	135.9
Anabaenopsis	Cyanobacteria	120.8
Crucigenia tetrapedia	Green	120.8
Ankistrodesmus convolutus	Green	105.7
Centric Diatom, 5 micron	Diatom	90.6
Navicula, <50 microns	Diatom	75.5 *
Pennate Diatom, 25-75 microns	Diatom	45.3 *
Oscillatoria #2	Cyanobacteria	30.2
Naviculodes staurineis	Diatom	30.2
Scenedesmus acuminatus	Green	30.2
Tetraedron minimum	Green	30.2
Diploneis	Diatom	15.1
Chaetoceros	Diatom	15.1
Centric Diatom, 15 micron	Diatom	15.1
Nitzschia	Diatom	15.1
Rhizosolenia	Diatom	15.1
Golenkinia	Green	15.1
Pediastrum simplex no var	Green	1.6
Pleurosigma/Gyrosigma	Diatom	1.2
Pennate Diatom, stacked	Diatom	0.4
Scenedesmus quad var maxima	Green	0.4
Euglena	Euglena	0.3
Nitzschia c.f. closterium	Diatom	0.2
Pennate Diatom, >150 microns	Diatom	0.2
Amphora	Diatom	0.2
Navicula, > 50 microns	Diatom	0.1
Closterium	Green	0.1
	TOTAL	41467.6

MPT2-B10-5

Species	Division	Cell Count
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	9614.2
Anabaena#2	Cyanobacteria	4696.1 *
Cryptophyte, 5-15 microns	Cryptophyte	1972.9 *
Centric Diatom, 10 micron	Diatom	755.0 *
Lyngbya limnetica	Cyanobacteria	649.3
Merismopedia tenuissima	Cyanobacteria	241.6
Ankistrodesmus nannoselene	Green	211.4
Crucigenia tetrapedia	Green	181.2
Navicula, <50 microns	Diatom	135.9 *
Nitzschia	Diatom	60.4
Scenedesmus acuminatus	Green	60.4
Scenedesmus bicaudata	Green	60.4
Ankistrodesmus convolutus	Green	45.3
Chlamydomonas	Green	45.3
Tetraedron minimum	Green	45.3
Cryptophyte, >15 microns	Cryptophyte	30.2
Raphidiopsis	Cyanobacteria	30.2
Pennate Diatom, 25-75 microns	Diatom	30.2 *
Centric Diatom, 5 micron	Diatom	30.2
Chaetoceros	Diatom	30.2
Naviculodes staurineis	Diatom	30.2
Scenedesmus bijuga	Green	30.2
Nitzschia closterium	Diatom	15.1
Amphiprora	Diatom	15.1
Dinoflagellates armoured	Dinoflagellate	15.1
Ankistrodesmus falcatus	Green	15.1
Euglena	Euglena	2.6
Synedra	Diatom	2.1
Pediastrum simplex var duo	Green	1.6
Pediastrum boryanum	Green	0.8
Nitzschia c.f. closterium	Diatom	0.6
Navicula, >50 microns	Diatom	0.2
Mastigloia	Diatom	0.2
Pennate Diatom, >150 microns	Diatom	0.1
Diploneis c.f. didyma	Diatom	0.1
Surirella	Diatom	0.1
Pleurosigma/Gyrosigma	Diatom	0.1
Amphora	Diatom	0.1
Closterium	Green	0.1
	TOTAL	19055.2

MPT2-B10-6

Species	Division	Cell Counts Cells/ml
Cryptophyte, 5-15 microns	Cryptophyte	1365.0
Anabaena #2	Cyanobacteria	520.0 *
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	338.0
Microcystis, 1-2 micron	Cyanobacteria	130.0
Lyngbya limnetica	Cyanobacteria	104.0
Cryptophyte, >15 microns	Cryptophyte	91.0 *
Chlamydomonas	Green	52.0
Naviculodes staurineis	Diatom	39.0
Nitzschia closterium	Diatom	39.0
Navicula, <50 microns	Diatom	39.0 *
Ankistrodesmus nannoselene	Green	39.0
Centric Diatom, 10 micron	Diatom	26.0
Pennate Diatom, 10-25 microns	Diatom	26.0 *
Scenedesmus bijuga	Green	26.0
Oscillatoria #1	Cyanobacteria	13.0
Cocconeis	Diatom	13.0
Pennate Diatom, 25-75 microns	Diatom	13.0 *
Hantzschia sp.	Diatom	13.0
Dinoflagellate, armoured	Dinoflagellate	13.0
Green #2	Green	13.0
Pleurosigma/Gyrosigma	Diatom	4.0
Bacillaria paradoxa	Diatom	1.5
Pennate Diatom, >150 microns	Diatom	0.8
Diploneis c.f. didyma	Diatom	0.7
Synedra	Diatom	0.5
Navicula, >50 microns	Diatom	0.4
Closterium	Green	0.4
Mastigloia	Diatom	0.2
Oscillatoria #3	Cyanobacteria	0.1
Euglena	Euglena	0.1
	TOTAL	2920.7

MPT2-B10-8

Species	Division	Cell Count Cells/ml
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	45793.4
Cryptophyte, 5-15 microns	Cryptophyte	9342.1 *
Lyngbya limnetica	Cyanobacteria	3099.6
Ankistrodesmus nanoselene	Green	2116.8
Centric Diatom, 10 micron	Diatom	907.2 *
Centric Diatom, 5 micron	Diatom	604.8
Nitzschia c.f. closterium	Diatom	529.2
Amphora	Diatom	302.4
Navicula, <50 microns	Diatoms	226.8 *
Ankistrodesmus convolutus	Green	151.2
Pennate Diatom, 25-75 microns	Diatom	75.6 *
Chaetoceros	Diatom	75.6
Pleurosigma/Gyrosigma	Diatom	5.0
Pennate Diatom, >150 microns	Diatoms	1.2
Mastigloia	Diatom	1.0
Euglena	Euglena	1.0
	TOTAL	63232.9

MPT2-B10-9

Species	Division	Cell Count Cells/ml
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	23763.4
Centric Diatom, 10 micron	Diatom	14239.9 *
Ankistrodesmus nanoselene	Green	2687.8
Cryptophyte, 5-15 microns	Cryptophyte	1963.0 *
Lyngbya limnetica	Cyanobacteria	1298.6
Chlorella	Green	1208.0
Euglena	Euglena	819.2 *
Nitzschia closterium	Diatom	392.6
Chaetoceros	Diatom	181.2
Centric Diatom, 5 micron	Diatom	181.2
Scenedesmus bijuga	Green	120.8
Centric Diatom, stacked, 5-15 microns	Diatom	90.6 *
Oscillatoria #1	Cyanobacteria	60.4
Centric Diatom, 15 micron	Diatom	60.4
Pennate Diatoms, 75-150 microns	Diatom	60.4 *
Cryptophyte, >15 microns	Cryptophyte	30.2
Raphidiopsis	Cyanobacteria	30.2
Centric Diatom, 20 microns	Diatom	30.2
Pennate Diatoms, 25-75 microns	Diatom	30.2 *
Navicula, >50 microns	Diatom	5.2
Oscillatoria #3	Cyanobacteria	1.4
Pennate Diatoms, >150 microns	Diatom	1.4
Pleurosigma/Gyrosigma	Diatom	0.6
Centric Diatom, 50 micron	Diatom	0.2
Amphora	Diatom	0.2
	TOTAL	47257.3

MPT13-B10-1

Species	Division	Cell Count Cells/ml
Single-celled Cyanobacteria, <3 microns	Cyanobacteria	50792.0
Anabaena#2	Cyanobacteria	33431.4 *
Cryptophyte, 5-15 microns	Cryptophyte	2899.2 *
Centric Diatom 10m	Diatom	2265.0 *
Ankistrodesmus nannoselene	Green	1238.2
Microcystis, 1-2 microns	Cyanobacteria	1087.2
Scenedesmus quadricata	Green	543.6
Lyngbya limnetica	Cyanobacteria	241.6
Crucigenia tetrapedia	Green	181.2
Chaetoceros	Diatom	151.0
Navicula, <50 microns	Diatom	120.8 *
Scenedesmus bijuga	Green	120.8
Scenedesmus quadricada var alternans	Green	120.8
Oocystis	Green	120.8
Nitzschia closterium	Diatom	90.6
Anabaenopsis	Cyanobacteria	60.4
Chodatella	Green	60.4
Tetraedron minimum	Green	60.4
Cryptophyte, >15 microns	Cryptophyte	30.2
Raphidiopsis	Cyanobacteria	30.2
Naviculodes staurineis	Diatom	30.2
Pennate Diatoms, 10-25 microns	Diatom	30.2
Centric Diatom, 30 micron	Diatom	30.2 *
Pennate Diatoms, 25-75 microns	Diatom	30.2 *
Tetraedron lunula	Green	30.2
Ankistrodesmus convolutus	Green	30.2
Tetraedron regulare	Green	30.2
Golenkinia	Green	30.2
Ankistrodesmus falcatus	Green	30.2
Tetraedron muticum	Green	30.2
Pleurosigma/Gyrosigma	Diatom	3.2
Euglena	Euglena	2.6
Pennate Diatoms, >150 microns	Diatom	1.8
Navicula, >50 microns	Diatom	1.2
Amphora	Diatom	0.8
Surirella	Diatom	0.4
	TOTAL	93957.8

MPT13-B10-2

Species	Division	Cell Count Cells/ml
Single Celled Cyanobacteria	Cyanobacteria	46619.8
Anabaena#2	Cyanobacteria	13016.2 *
Cryptophyte, 5-15 microns	Cryptophyte	3080.4 *
Ankistrodesmus nannoselene	Green	2144.2
Centric Diatom, 10 micron	Diatom	573.8 *
Merismopedia, 2 micron	Green	483.2
Lyngbya limnetica	Cyanobacteria	453.0
Anabaenopsis	Cyanobacteria	241.6
Scenedesmus quadricata	Green	241.6
Navicula, <50 microns	Diatom	151.0
Centric Diatom, 5 micron	Diatom	151.0
Crucigenia tetrapedia	Green	120.8
Tetrastrum heteracanthum	Green	120.8
Chaetoceros	Diatom	60.4
Pennate Diatom, 25-75 microns	Diatom	60.4 *
Naviculodes staurineis	Diatom	60.4
Pennate Diatom, 10-25 microns	Diatom	60.4
Tetraedron minimum	Green	60.4
Scenedesmus bijuga	Green	60.4
Nitzschia closterium	Diatom	30.2
Centric Diatom, 15 micron	Diatom	30.2
Achnanthes	Diatom	30.2
Ankistrodesmus convolutus	Green	30.2
Euglena	Euglena	10.4
Pleurosigma/Gyrosigma	Diatom	2.6
Pediastrum simplex var duo	Green	1.6
Pediastrum simplex no var	Green	1.6
Amphora	Diatom	0.8
Pennate Diatom, >150 microns	Diatom	0.8
Scenedesmus quad var maxima	Green	0.8
Nitzschia c.f. closterium	Diatom	0.6
Centric Diatom, 30 microns	Diatom	0.4
Surirella	Diatom	0.2
Synedra	Diatom	0.2
Navicula, >50 microns	Diatom	0.2
Amphiprora	Diatom	0.2
	TOTAL	67901

MPT13-B10-3

Species	Division	Cell Count
Anabaena #2	Cyanobacteria	69007.0
Single-Celled Cyanobacteria	Cyanobacteria	29931.0
Ankistrodesmus nanoselene	Green	5843.7
Cryptophyte, 5-15 microns	Cryptophyte	3080.4 *
Centric Diatom, 10 micron	Diatom	1691.2 *
Microcystis, 1-2 microns	Cyanobacteria	1570.4
Anabaenopsis	Cyanobacteria	996.6
Crucigenia tetrapedia	Green	845.6
Merismopedia tenuissima	Green	483.2
Kirchneriella contorta	Green	483.2
Scenedesmus quadricata	Green	422.8
Lyngbya limnetica	Cyanobacteria	211.4
Scenedesmus bijuga	Green	181.4
Chaetoceros	Diatom	181.2
Scenedesmus dimorphus	Green	181.2
Pennate Diatom, 10-25 microns	Diatom	151.0 *
Centric Diatoms, stacked, 5-15 microns	Diatom	120.8 *
Tetraedron muticum	Green	120.8
Scenedesmus quadricada var alternans	Green	120.8
Raphidiopsis	Cyanobacteria	90.6
Ankistrodesmus falcatus	Green	90.6
Centric Diatom, 5 micron	Diatom	60.4
Chodatella	Green	60.4
Euglena	Euglena	59.2
Cosmarium	Green	30.2
Cryptophyte, >15 microns	Cryptophyte	30.2
Nitzschia closterium	Diatom	30.2
Pennate Diatom, 25-75 microns	Diatom	30.2 *
Chlorogonium	Green	30.2
Oscillatoria #1	Green	30.2
Pediastrum simplex no var	Green	4.8
Pediastrum duplex var duo	Green	4.4
Pediastrum boryanum	Green	3.2
Pediastrum simplex var duo	Green	1.9
Scenedesmus quad var maxima	Green	1.6
Synedra	Diatom	0.2
Pleurosigma/Gyrosigma	Diatom	0.2
	TOTAL	116182.4

APPENDIX G
MACROINVERTEBRATE RAW DATA

BIOLOGICAL COMMUNITY PARAMETERS

KBN - MAYPORT
 Sample Type: MACROFAUNA

Sample Date (YY/MM/DD) 92/01/20
 Sample Area (sq. m.): 0.0230

NAVISIA ID NUMBER	LAB STATION NUMBER	TOTAL TAXA	MEAN TAXA PER REPL.	TOTAL NO. INDIVIDUALS	MEAN DENSITY	STANDARD DEVIATION	H'	J'	D	\bar{d}	e
MPT-2-BIO-2	001	15	7.0	93	1348	883	2.03	0.75	3.09	2.93	0.73
MPT-2-BIO-4	002	32	16.7	418	6058	8184	2.45	0.71	5.14	3.54	0.53
MPT-2-BIO-5	003	14	6.3	59	855	954	1.98	0.75	3.19	2.86	0.79
MPT-2-BIO-6	004	15	8.0	76	1101	708	2.28	0.84	3.23	3.28	0.93
MPT-2-BIO-8	005	11	5.3	62	899	1011	1.73	0.72	2.42	2.49	0.73
MPT-2-BIO-9	006	9	4.3	75	1087	428	1.82	0.83	1.85	2.62	1.00
MPT-B-BIO-1	007	24	14.3	1514	21942	22330	1.00	0.31	3.14	1.44	0.17
MPT-B-BIO-2	008	22	12.7	135	1957	415	2.42	0.78	4.28	3.49	0.77
MPT-B-BIO-3	009	24	12.7	454	6580	8785	1.97	0.62	3.76	2.84	0.42

Taxonomic Species List

KBN - Mayport -- Collected January 1992

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ANNELIDA

HIRUDINEA

HIRUDINEA (LPIL)

OLIGOCHAETA

OLIGOCHAETA (LPIL)

LUMBRICULIDAE

LUMBRICULIDAE (LPIL)

NAIDIDAE

NAIDIDAE (LPIL)

TUBIFICIDAE

TUBIFICIDAE (LPIL)

TUBIFICOIDES HETEROCHAETUS

POLYCHAETA

AMPHARETIDAE

HOSSONIA FLORIDA

CAPITELLIDAE

CAPITELLA CAPITATA

CAPITELLIDAE (LPIL)

HESIONIDAE

HESIONIDAE (LPIL)

MALDANIDAE

MALDANIDAE (LPIL)

NEREIDAE

LAEONEREIS CULVERI

NEREIDAE (LPIL)

SPIONIDAE

POLYDORA CORNUTA

POLYDORA SOCIALIS

STREBLOSPIO BENEDICTI

TRICHOBRANCHIDAE

TRICHOBRANCHIDAE (LPIL)

ARTHROPODA (ARACHNIDA)

ACARINA

ACARINA (LPIL)

HYDRACARINA

HYDRACARINA (LPIL)

ARTHROPODA (CRUSTACEA)

AMPHIPODA

AORIDAE

GRANDIDIERELLA BONNIEROIDES

COROPHIIDAE

COROPHIIDAE (LPIL)

COROPHIUM (LPIL)

COROPHIUM LACUSTRE

GAMMARIDAE

GAMMARIDAE (LPIL)

GAMMARUS (LPIL)

GAMMARUS PALUSTRIS

MELITIDAE

MELITA (LPIL)

TAXONOMIC LISTING

Taxonomic Species List

03/06/72

KBN - Mayport -- Collected January 1992

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MELITA INTERMEDIA
MELITIDAE (LPIL)
TALITRIDAE
ORCHESTIA GRILLUS
ORCHESTIA SP.B
TALITRIDAE (LPIL)
DECAPODA (NATANTIA)
PALAEMONIDAE
PALAEMONETES PUGIO
DECAPODA (REPTANTIA)
PORTUNIDAE
CALLINECTES SAPIDUS
ISOPODA
ANTHURIDAE
ANTHURIDAE (LPIL)
CYATHURA (LPIL)
CYATHURA POLITA
LIGIIDAE
VANDELOSCIA SP.A
SPHAEROMATIDAE
CASSIIONIDEA OVALIS
SPHAEROMATIDAE (LPIL)
OSTRACODA
OSTRACODA (LPIL)
CANDONIDAE
CANDONIDAE GENUS A
CYTHERIDEIDAE
CYTHERIDEIDAE (LPIL)
HAPLOCYTHERIDEA SP.A
TANAIDACEA
PARATANAIDAE
HARGERIA (LPIL)
HARGERIA RAPAX
PARATANAIDAE (LPIL)
ARTHROPODA (INSECTA)
COLEOPTERA
CHRYSOMELIDAE
AGASICLES HYGROPHILA
COLLEMBOLA
ISOTOMIDAE
ISOTOMURUS PALUSTRIS
DIPTERA
CHIRONOMIDAE
CHIRONOMIDAE GENUS AI
CHIRONOMUS SP.A
DICROTENDIPES (LPIL)
GOELDICHIRONOMUS HOLOPRASINUS
POLYPEDILUM SCALAENUM

EPHYDRIDAE
EPHYORA (LPIL)

TAXONOMIC LISTING

Taxonomic Species List

03/06/92

KBN - Mayport -- Collected January 1992

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MUSCIDAE
MUSCIDAE (LPIL)
PSYCHODIDAE
TELHATOSCOPIUS SUPERBUS
STRATIOMYIDAE
STRATIOMYS (LPIL)
TIPULIDAE
ORMOSIA SP.A
TIPULIDAE (LPIL)
HEMIPTERA
CORIXIDAE
HESPEROCORIXA MINOR
LEPIDOPTERA
PYRALIDAE
VOGTIA (LPIL)
ODONATA
COENAGRIONIDAE
ENALLAGMA (LPIL)
MOLLUSCA
GASTROPODA
GASTROPODA (LPIL)
HYDROBIIDAE
HYDROBIIDAE (LPIL)
MELAMPIDAE
MELAMPUS BIDENTATUS
PELECYPODA
PELECYPODA (LPIL)
MYTILIDAE
AMYGDALUM SAGITTATUM
RHYNCHOCOELA
RHYNCHOCOELA (LPIL)

Sample Date 92/01/21
 Sample Size 0.0230 SQ. M

Station: 001
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-2

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
** ANNELIDA					
OLIGOCHAETA					
OLIGOCHAETA (LPIL)	0	0	23	23	24.73
NAIDIDAE					
NAIDIDAE (LPIL)	0	1	9	10	10.75
TUBIFICIDAE					
TUBIFICIDAE (LPIL)	8	3	0	11	11.63
** MOLLUSCA					
GASTROPODA					
HYDROBIIDAE					
HYDROBIIDAE (LPIL)	0	0	1	1	1.07
** ARTHROPODA (CRUSTACEA)					
ISOPODA					
LIGIIDAE					
VANDELOSCIA SP.A	0	0	1	1	1.07
OSTRACODA					
CANDONIDAE					
CANDONIDAE GENUS A	0	1	0	1	1.07
** ARTHROPODA (INSECTA)					
DIPTERA					
CHIRONOMIDAE					
CHIRONOMUS SP.A	10	3	7	20	21.50
GOELOCHIRONOMUS HOLOPRASINUS	6	3	8	17	18.28
TIPULIDAE					
TIPULIDAE (LPIL)	0	0	1	1	1.07
EPHYDRIDAE					
EPHYDRA (LPIL)	0	1	0	1	1.07
STRATIOMYIDAE					
STRATIOMYS (LPIL)	0	1	0	1	1.07
ODONATA					
COENAGRIONIDAE					
ENALLAGMA (LPIL)	0	0	1	1	1.07

-----Report Continued on Next Page-----

Sample Date 92/01/21
Sample Size 0.0230 SQ. M

Station: 001
Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-2

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TAXON	REPA	REPB	REPC	TOTAL	PERCENT
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** ARTHROPODA (INSECTA)

COLLEMBOLA

ISOTOMIDAE

ISOTOMURUS PALUSTRIS 0 0 1 1 1.07

HEMIPTERA

CORIXIDAE

HESPEROCORIXA MINOR 3 0 0 3 3.23

COLEOPTERA

CHRYSOMELIDAE

AGASICLES HYGROPHILA 0 0 1 1 1.07

-----Report Continued on Next Page-----

Sample Date 92/01/21
 Sample Size 0.0230 50. M

Station: 001
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-2

NOTE:
 LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA	REPB	REPC
Total Individuals per Replicate:		
27	13	53
Total Taxa per replicate:		
4	7	10

Total number of taxa for this station = 15
 Total number of individuals for this station = 93
 Mean Number Individuals per square meter = 1348

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	3	20.0	44	47.3
MOLLUSCA	1	6.6	1	1.0
ARTHROPODA	11	73.3	48	51.6
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	0	.0	0	.0

Sample Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 002
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-4

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
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** ANNELIDA

POLYCHAETA

AMPHARETIDAE					
HOBSONIA FLORIDA	4	1	8	13	3.11
CAPITELLIDAE					
CAPITELLIDAE (LPIL)	0	0	1	1	0.24
CAPITELLA CAPITATA	6	1	27	34	8.13
HESIONIDAE					
HESIONIDAE (LPIL)	0	1	2	3	0.72
MALDANIDAE					
MALDANIDAE (LPIL)	0	0	1	1	0.24
NEREIDAE					
NEREIDAE (LPIL)	0	0	2	2	0.48
LAEONEREIS CULVERI	0	0	7	7	1.68
SPIONIDAE					
POLYDORA SOCIALIS	0	0	4	4	0.96
POLYDORA CORNUTA	0	1	1	2	0.48
STREBLOSPIO BENEDICTI	10	2	45	57	13.64
TRICHOBRANCHIDAE					
TRICHOBRANCHIDAE (LPIL)	1	0	0	1	0.24

OLIGOCHAETA

OLIGOCHAETA (LPIL)	0	3	39	42	10.05
NAIDIDAE					
NAIDIDAE (LPIL)	2	0	0	2	0.48
TUBIFICIDAE					
TUBIFICIDAE (LPIL)	6	3	62	71	16.99
TUBIFICOIDES HETEROCHAETUS	0	1	11	12	2.87
LUMBRICULIDAE					
LUMBRICULIDAE (LPIL)	0	0	99	99	23.68

** MOLLUSCA

PELECYPODA

PELECYPODA (LPIL)	1	0	0	1	0.24
MYTILIDAE					
AMYGDALUM SAGITTATUM	0	0	1	1	0.24

-----Report Continued on Next Page-----

Sample Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 002
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-4

TAXON	REPA	REP8	REPC	TOTAL	PERCENT
** MOLLUSCA					
GASTROPODA					
HYDROBIIDAE					
HYDROBIIDAE (LPIL)	1	0	0	1	0.24
** ARTHROPODA (CRUSTACEA)					
ISOPODA					
ANTHURIDAE					
CYATHURA POLITA	1	0	0	1	0.24
SPHAEROMATIDAE					
CASSIDINIDEA OVALIS	0	1	12	13	3.11
AMPHIPODA					
GAMMARIDAE					
GAMMARUS PALUSTRIS	2	0	2	4	0.96
GAMMARUS (LPIL)	0	0	1	1	0.24
TALITRIDAE					
ORCHESTIA GRILLUS	0	1	0	1	0.24
ORCHESTIA SP.B	0	0	1	1	0.24
TANAIDACEA					
PARATANAIDAE					
HARGERIA (LPIL)	1	0	5	6	1.44
DECAPODA (NATANTIA)					
PALAEMONIDAE					
PALAEMONETES PUGIO	0	0	1	1	0.24
DECAPODA (REPTANTIA)					
PORTUNIDAE					
CALLINECTES SAPIDUS	0	0	1	1	0.24
** ARTHROPODA (ARACHNIDA)					
ACARINA					
ACARINA (LPIL)	1	0	0	1	0.24
** ARTHROPODA (INSECTA)					
DIPTERA					
CHIRONOMIDAE					
CHIRONOMUS SP.A	8	1	5	14	3.35

Sample Date 92/01/22
Sample Size 0.0230 SQ. M

Station: 002
Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-4

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
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** ARTHROPODA (INSECTA)

DIPTERA

CHIRONOMIDAE

DICROTENDIPES (LPIL)	2	0	17	19	4.54
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COLLEMBOLA

ISOTOMIDAE

ISOTOMURUS PALUSTRIS	0	0	1	1	0.24
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-----Report Continued on Next Page-----

Collection Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 002
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-4

NOTE:

LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA	REPB	REPC
Total Individuals per Replicate:		
46	16	356
Total Taxa per replicate:		
14	11	25

Total number of taxa for this station = 32

Total number of individuals for this station = 418

Mean Number Individuals per square meter = 6058

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	16	50.0	351	83.9
MOLLUSCA	3	9.3	3	.7
ARTHROPODA	13	40.6	64	15.3
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	0	.0	0	.0

Sample Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 003
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-5

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
** ANNELIDA					
POLYCHAETA					
HESIONIDAE					
HESIONIDAE (LPIL)	0	0	1	1	1.70
OLIGOCHAETA					
OLIGOCHAETA (LPIL)	5	0	0	5	8.47
TUBIFICIDAE					
TUBIFICIDAE (LPIL)	1	4	0	5	8.47
TUBIFICOIDES HETEROCHAETUS	1	1	0	2	3.39
** MOLLUSCA					
PELECYPODA					
PELECYPODA (LPIL)	0	1	0	1	1.70
GASTROPODA					
HYDROBIIDAE					
HYDROBIIDAE (LPIL)	0	4	0	4	6.78
** ARTHROPODA (CRUSTACEA)					
ISOPODA					
SPHAEROMATIDAE					
CASSIDINIDEA OVALIS	0	1	0	1	1.70
AMPHIPODA					
GAMMARIDAE					
GAMMARUS (LPIL)	0	1	0	1	1.70
OSTRACODA					
CYTHERIDEIDAE					
HAPLOCYTHERIDEA SP.A	0	1	0	1	1.70
** ARTHROPODA (ARACHNIDA)					
HYDRACARINA					
HYDRACARINA (LPIL)	0	1	0	1	1.70

Sample Date 92/01/22
Sample Size 0.0230 SQ. M

Station: 003
Sample Type: MACROFAUNA

Comments: Station MPT-2-B10-5

TAXON	REPA	REP8	REPC	TOTAL	PERCENT
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** ARTHROPODA (INSECTA)

DIPTERA

CHIRONOMIDAE

CHIRONOMUS SP.A 0 1 1 2 3.39

DICROTENDIPES (LPIL) 0 20 4 24 40.68

GOELDICHIRONOMUS HOLOPRASINUS 0 9 1 10 16.95

MUSCIDAE

MUSCIDAE (LPIL) 0 1 0 1 1.70

-----Report Continued on Next Page-----

Sample Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 003
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-5

NOTE:
 LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA	REPB	REPC
Total Individuals per Replicate:		
7	45	7
Total Taxa per replicate:		
3	12	4

Total number of taxa for this station = 14

Total number of individuals for this station = 59

Mean Number Individuals per square meter = 855

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	4	28.5	13	22.0
MOLLUSCA	2	14.2	5	8.4
ARTHROPODA	8	57.1	41	69.4
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	0	.0	0	.0

Collection Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 004
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-6

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
** ANNELIDA					
POLYCHAETA					
AMPHARETIDAE					
HOBSONIA FLORIDA	3	2	4	9	11.84
HESIONIDAE					
HESIONIDAE (LPIL)	1	0	18	19	25.00
TRICHOBRANCHIDAE					
TRICHOBRANCHIDAE (LPIL)	1	0	1	2	2.63
OLIGOCHAETA					
OLIGOCHAETA (LPIL)	0	0	2	2	2.63
TUBIFICIDAE					
TUBIFICIDAE (LPIL)	0	7	3	10	13.16
HIRUDINEA					
HIRUDINEA (LPIL)	1	0	0	1	1.32
** MOLLUSCA					
PELECYPODA					
PELECYPODA (LPIL)	2	1	0	3	3.95
GASTROPODA					
GASTROPODA (LPIL)	0	0	1	1	1.32
HYDROBIIIDAE					
HYDROBIIIDAE (LPIL)	4	3	4	11	14.47
MELAMPIDAE					
MELAMPUS BIDENTATUS	0	0	1	1	1.32
** ARTHROPODA (CRUSTACEA)					
AMPHIPODA					
GAMMARIDAE					
GAMMARIDAE (LPIL)	0	0	1	1	1.32
OSTRACODA					
CYTHERIDEIDAE					
HAPLOCYTHERIDEA SP.A	0	1	0	1	1.32

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Sample Date 92/01/22
Sample Size 0.0230 SQ. M

Station: 004
Sample Type: MACROFAUNA

Comments: Station MPT-2-BIG-6

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
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** ARTHROPODA (INSECTA)

DIPTERA

CHIRONOMIDAE					
CHIRONOMUS SP.A	3	0	4	7	9.21
DICROTENDIPES (LPIL)	3	0	0	3	3.95
GOELDICHIRONOMUS HOLOPRASINUS	0	0	5	5	6.58

-----Report Continued on Next Page-----

Collection Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 004
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-6

NOTE:
 LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA	REPB	REPC
Total Individuals per Replicate:		
18	14	44
Total Taxa per replicate:		
6	5	11

Total number of taxa for this station = 15
 Total number of individuals for this station = 76
 Mean Number Individuals per square meter = 1101

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	6	40.0	43	56.5
MOLLUSCA	4	26.6	16	21.0
ARTHROPODA	5	33.3	17	22.3
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	0	.0	0	.0

Sample Date 92/01/21
 Sample Size 0.0230 SQ. M

Station: 005
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-8

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
** ANNELIDA					
OLIGOCHAETA					
LUMBRICULIDAE					
LUMBRICULIDAE (LPIL)	0	1	0	1	1.61
** MOLLUSCA					
GASTROPODA					
GASTROPODA (LPIL)	0	1	0	1	1.61
HYDROBIIDAE					
HYDROBIIDAE (LPIL)	0	1	3	4	6.45
** ARTHROPODA (CRUSTACEA)					
ISOPODA					
SPHAEROMATIDAE					
CASSIDINIDEA OVALIS	1	3	1	5	8.06
OSTRACODA					
CYTHERIDEIDAE					
CYTHERIDEIDAE (LPIL)	0	0	2	2	3.23
HAPLOCYTHERIDEA SP.A	0	0	24	24	38.71
** ARTHROPODA (INSECTA)					
DIPTERA					
CHIRONOMIDAE					
CHIRONOMUS SP.A	0	4	0	4	6.45
DICROTENDIPES (LPIL)	0	1	0	1	1.61
CHIRONOMIDAE GENUS AI	1	0	0	1	1.61
GOELDICHIRONOMUS HOLOPRASINUS	1	1	16	18	29.03
COLLEMBOLA					
ISOTOMIDAE					
ISOTOMURUS PALUSTRIS	0	0	1	1	1.61

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Collection Date 92/01/21
 Sample Size 0.0230 SQ. M

Station: 005
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-8

NOTE:
 LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA REPB REPC
 Total Individuals per Replicate:
 3 12 47
 Total Taxa per replicate:
 3 7 6

Total number of taxa for this station = 11
 Total number of individuals for this station = 62
 Mean Number Individuals per square meter = 899

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	1	9.0	1	1.6
MOLLUSCA	2	18.1	5	8.0
ARTHROPODA	8	72.7	56	90.3
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	0	.0	0	.0

Sample Date 92/01/21
 Sample Size 0.0230 SQ. M

Station: 006
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-9

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
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** ANNELIDA

OLIGOCHAETA					
OLIGOCHAETA (LPIL)	17	0	0	17	22.67
NAIDIDAE					
NAIDIDAE (LPIL)	0	1	0	1	1.33
TUBIFICIDAE					
TUBIFICIDAE (LPIL)	0	5	2	7	9.33

** ARTHROPODA (CRUSTACEA)

OSTRACODA					
CANDONIDAE					
CANDONIDAE GENUS A	2	0	0	2	2.67

** ARTHROPODA (INSECTA)

DIPTERA					
CHIRONOMIDAE					
CHIRONOMUS SP.A	7	0	4	11	14.67
GOELDICHIRONOMUS HOLOPRASINUS	0	7	12	19	25.33
TIPULIDAE					
ORMOSIA SP.A	0	0	2	2	2.67
PSYCHODIDAE					
TELMATOSCOPIUS SUPERBUS	2	0	13	15	20.00

LEPIDOPTERA					
PYRALIDAE					
VOGTIA (LPIL)	0	1	0	1	1.33

-----Report Continued on Next Page-----

Sample Date 92/01/21
 Sample Size 0.0230 SQ. M

Station: 006
 Sample Type: MACROFAUNA

Comments: Station MPT-2-BIO-9

NOTE:

LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA REP8 REPC
 Total Individuals per Replicate:
 28 14 33
 Total Taxa per replicate:
 4 4 5

Total number of taxa for this station = 9
 Total number of individuals for this station = 75
 Mean Number Individuals per square meter = 1087

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	3	33.3	25	33.3
MOLLUSCA	0	.0	0	.0
ARTHROPODA	6	66.6	50	66.6
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	0	.0	0	.0

Sample Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 007
 Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-1

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
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** ANNELIDA

POLYCHAETA

AMPHARETIDAE					
HOBSONIA FLORIDA	0	1	1	2	0.13
CAPITELLIDAE					
CAPITELLA CAPITATA	20	5	1	26	1.72
NEREIDAE					
NEREIDAE (LPIL)	0	2	1	3	0.20
LAONEREIS CULVERTI	40	2	9	51	3.37
SPIONIDAE					
POLYDORA SOCIALIS	0	1	0	1	0.07
POLYDORA CORNUTA	0	4	3	7	0.46
STREBLOSPIO BENEDICTI	31	72	8	111	7.33

OLIGOCHAETA

OLIGOCHAETA (LPIL)	48	7	5	60	3.96
TUBIFICIDAE					
TUBIFICOIDES HETEROCHAETUS	5	15	1	21	1.39
LUMBRICULIDAE					
LUMBRICULIDAE (LPIL)	902	276	1	1179	77.87

** MOLLUSCA

PELECYPODA

PELECYPODA (LPIL)	0	0	2	2	0.13
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GASTROPODA

GASTROPODA (LPIL)	0	1	0	1	0.07
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** ARTHROPODA (CRUSTACEA)

ISOPODA

ANTHURIDAE					
ANTHURIDAE (LPIL)	0	0	1	1	0.07
CYATHURA POLITA	0	1	0	1	0.07
SPHAEROMATIDAE					
CASSIDINIDEA OVALIS	1	1	0	2	0.13

-----Report Continued on Next Page-----

le Date 92/01/22
le Size 0.0230 SQ. M

Station: 007
Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-1

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
** ARTHROPODA (CRUSTACEA)					
AMPHIPODA					
COROPHIIDAE					
COROPHIUM (LPIL)	0	1	1	2	0.13
GAMMARIDAE					
GAMMARIDAE (LPIL)	0	1	0	1	0.07
GAMMARUS PALUSTRIS	0	2	0	2	0.13
GAMMARUS (LPIL)	0	1	0	1	0.07
TALITRIDAE					
TALITRIDAE (LPIL)	1	0	0	1	0.07
TANAIDACEA					
PARATANAIDAE					
HARGERIA (LPIL)	0	1	0	1	0.07
MOLLUSCA					
CYTHERIDEIDAE					
HAPLOCYTHERIDEA SP.A	6	0	9	15	0.99
** ARTHROPODA (INSECTA)					
DIPTERA					
CHIRONOMIDAE					
CHIRONOMUS SP.A	5	0	2	7	0.46
DICROTENDIPES (LPIL)	0	16	0	16	1.06

-----Report Continued on Next Page-----

Sample Date 92/01/22
 Sample Size 0.0230 SQ. M

Station: 007
 Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-1

NOTE:
 LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA REPB REPC
 Total Individuals per Replicate:
 1059 410 45
 Total Taxa per replicate:
 10 19 14

Total number of taxa for this station = 24
 Total number of individuals for this station = 1514
 Mean Number Individuals per square meter = 21942

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	10	41.6	1461	96.5
MOLLUSCA	2	8.3	3	.2
ARTHROPODA	12	50.0	50	3.3
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	0	.0	0	.0

Collection Date 92/01/20
 Sample Size 0.0230 SQ. M

Station: 008
 Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-2

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
** ANNELIDA					
POLYCHAETA					
AMPHARETIDAE					
HOBSONIA FLORIDA	2	4	0	6	4.44
HESIONIDAE					
HESIONIDAE (LPIL)	1	0	0	1	0.74
NEREIDAE					
LAONEREIS CULVERI	2	14	1	17	12.59
SPIONIDAE					
POLYDORA SOCIALIS	1	0	0	1	0.74
OLIGOCHAETA					
OLIGOCHAETA (LPIL)	10	0	1	11	8.15
TUBIFICIDAE					
TUBIFICIDAE (LPIL)	1	0	0	1	0.74
** MOLLUSCA					
GASTROPODA					
GASTROPODA (LPIL)	1	1	0	2	1.48
HYDROBIIDAE					
HYDROBIIDAE (LPIL)	0	1	0	1	0.74
MELAMPIDAE					
MELAMPUS BIDENTATUS	0	1	0	1	0.74
** ARTHROPODA (CRUSTACEA)					
ISOPODA					
ANTHURIDAE					
CYATHURA POLITA	3	8	1	12	8.89
CYATHURA (LPIL)	0	0	1	1	0.74
SPHAEROMATIDAE					
SPHAEROMATIDAE (LPIL)	1	0	0	1	0.74
CASSIDINIDEA OVALIS	12	4	22	38	28.15
AMPHIPODA					
MELITIDAE					
MELITIDAE (LPIL)	2	0	0	2	1.48

-----Report Continued on Next Page-----

Sample Date 92/01/20
 Sample Size 0.0230 SQ. M

Station: 008
 Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-2

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
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** ARTHROPODA (CRUSTACEA)

AMPHIPODA

MELITIDAE					
MELITA (LPIL)	4	0	0	4	2.96
TALITRIDAE					
TALITRIDAE (LPIL)	1	0	0	1	0.74

TANAIDACEA

PARATANAIDAE					
PARATANAIDAE (LPIL)	0	1	1	2	1.48
HARGERIA (LPIL)	5	2	1	8	5.93

** ARTHROPODA (INSECTA)

DIPTERA

CHIRONOMIDAE					
CHIRONOMUS SP.A	7	8	1	16	11.85
POLYPEDILUM SCALAENUM	0	0	1	1	0.74
DICROTENDIPES (LPIL)	1	0	4	5	3.70
GOELDICHIRONOMUS HOLOPRASINUS	1	0	2	3	2.22

-----Report Continued on Next Page-----

Sample Date 92/01/20
 Sample Size 0.0230 SQ. M

Station: 008
 Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-2

NOTE:

LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA REPB REPC

Total Individuals per Replicate:

55 44 36

Total Taxa per replicate:

17 10 11

Total number of taxa for this station = 22

Total number of individuals for this station = 135

Mean Number Individuals per square meter = 1957

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	6	27.2	37	27.4
MOLLUSCA	3	13.6	4	2.9
ARTHROPODA	13	59.0	94	69.6
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	0	.0	0	.0

Sample Date 92/01/20
Sample Size 0.0230 SQ. M

Station: 009
Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-3

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
** RHYNCHOCOELA					
RHYNCHOCOELA (LPIL)	0	1	0	1	0.22
** ANNELIDA					
POLYCHAETA					
CAPITELLIDAE					
CAPITELLIDAE (LPIL)	0	2	0	2	0.44
HESIONIDAE					
HESIONIDAE (LPIL)	2	0	6	8	1.76
NEREIDAE					
NEREIDAE (LPIL)	0	4	0	4	0.88
LAONEREIS CULVERI	0	8	3	11	2.42
SPIONIDAE					
POLYDORA SOCIALIS	0	2	0	2	0.44
POLYDORA CORNUTA	0	3	2	5	1.10
STREBLOSPIO BENEDICTI	0	13	3	16	3.52
OLIGOCHAETA					
OLIGOCHAETA (LPIL)	0	11	0	11	2.42
** ARTHROPODA (CRUSTACEA)					
ISOPODA					
ANTHURIDAE					
CYATHURA POLITA	0	4	0	4	0.88
SPHAEROMATIDAE					
CASSIDINIDEA OVALIS	0	17	0	17	3.74
AMPHIPODA					
COROPHIIDAE					
COROPHIIDAE (LPIL)	0	11	1	12	2.64
COROPHIUM LACUSTRE	12	194	24	230	50.66
COROPHIUM (LPIL)	2	31	3	36	7.93
AORIDAE					
GRANDIDIERELLA BONNIEROIDES	0	4	0	4	0.88
MELITIDAE					
MELITIDAE (LPIL)	0	4	1	5	1.10
MELITA INTERMEDIA	2	1	0	3	0.66

-----Report Continued on Next Page-----

File Date 92/01/20
File Size 0.0230 SQ. M

Station: 009
Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-3

TAXON	REPA	REPB	REPC	TOTAL	PERCENT
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** ARTHROPODA (CRUSTACEA)

AMPHIPODA

MELITIDAE

MELITA (LPIL)	2	29	3	34	7.49
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TANAIDACEA

PARATANAIDAE

PARATANAIDAE (LPIL)	0	2	0	2	0.44
HARGERIA RAPAX	0	1	0	1	0.22
HARGERIA (LPIL)	0	36	4	40	8.81

OSTRACODA

OSTRACODA (LPIL)	0	1	0	1	0.22
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ARTHROPODA (INSECTA)

DIPTERA

CHIRONOMIDAE

POLYPEDILUM SCALAENUM	0	1	0	1	0.22
DICROTENOIPES (LPIL)	0	4	0	4	0.88

-----Report Continued on Next Page-----

Sample Date 92/01/20
 Sample Size 0.0230 SQ. M

Station: 009
 Sample Type: MACROFAUNA

Comments: Station MPT-B-BIO-3

NOTE:
 LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

REPA	REPB	REPC
Total Individuals per Replicate:		
20	384	50
Total Taxa per replicate:		
5	23	10

Total number of taxa for this station = 24

Total number of individuals for this station = 454

Mean Number Individuals per square meter = 6580

PHYLUM	TOTAL # TAXA	% TAXA	TOTAL # INDIVIDUALS	% INDIVIDUALS
ANNELIDA	8	33.3	59	13.0
MOLLUSCA	0	.0	0	.0
ARTHROPODA	15	62.5	394	86.7
ECHINODERMATA	0	.0	0	.0
MISCELLANEOUS	1	4.1	1	.2

APPENDIX H
VEGETATION OBSERVED AT NAVSTA MAYPORT
JANUARY 1992

Table H-1. Vegetation Observed at SWMU 2 (NIRP Site 2), NAVSTA Mayport
(January 1992)

Common Name	Scientific Name	USACE	DER
Groundsel Bush	<i>Baccharis halimifolia</i>	FAC	-
Cabbage Palm	<i>Sabal palmetto</i>	FAC	I
Seashore Paspalum	<i>Paspalum vaginatum</i>	OBL	S
Bermuda Grass	<i>Cynodon dactylon</i>	FACU	-
Bushy Broom Grass	<i>Andropogon glomeratus</i>	FACW	-
Coastal Plain Pennywort	<i>Hydrocotyle bonariensis</i>	FACW	-
Pony-foot	<i>Dichondra carolinensis</i>	FACW	-
Southern Fleabane	<i>Erigeron quercifolius</i>	FAC	-

Source: KBN Engineering and Applied Sciences, Inc., 1992

Table H-2. Vegetation Observed at SWMU 3 (NIRP Site 4), NAVSTA Mayport
(January 1992)

Common Name	Scientific Name	USACE	DER
Marsh Elder	<i>Iva frutescens</i>	FACW	S
Bushy Broom Grass	<i>Andropogon glomeratus</i>	FACW	-
Pennywort	<i>Hydrocotyle</i> sp.	FACW	-
		OBL	-
		OBL	T
Seaside Goldenrod	<i>Solidago sempervirens</i>	FACW	-
Sabal Palm	<i>Sabal palmetto</i>	FAC	I
Common Beggar's-tick	<i>Bidens alba</i>	FACW	-
Bermuda Grass	<i>Cynodon dactylon</i>	FACU	-
Chinaberry	<i>Melia azedarach</i>	-	-
Camphor Weed	<i>Heterotheca subaxillaris</i>	FACU	-
Blue Maidencane	<i>Amphicarpum muhlenbergianum</i>	FACW	-
Common Wild Lettuce	<i>Lactuca graminifolia</i>	FACU	-
Spiny-leaved Sowthistle	<i>Sonchus asper</i>	FAC	-
Pampas Grass	<i>Cortaderia selloana</i>	-	-
Fall Panicum	<i>Panicum dichotomiflorum</i>	FACW	-
Vasey Grass	<i>Paspalum urvillei</i>	FAC	-
Common Ragweed	<i>Ambrosia artemisiifolia</i>	FACU	-
Sharp-pod Morning-glory	<i>Ipomoea cordatotriloba</i>	FACU	-

Source: KBN Engineering and Applied Sciences, Inc., 1992.

Table H-3. Vegetation Observed at SWMU 4 (NIRP Site 5), NAVSTA Mayport
(January 1992)

Common Name	Scientific Name	USACE	DER
Groundsel Bush	<i>Baccharis halimifolia</i>	FAC	-
Slash Pine	<i>Pinus elliottii</i>	FACW	-
Common Beggar's-tick	<i>Bidens alba</i>	FACW	-
Vasey Grass	<i>Paspalum urvillei</i>	FAC	-
Seaside Goldenrod	<i>Solidago sempervirens</i>	FACW	-
Brazilian Verbena	<i>Verbena brasiliensis</i>	FAC	-
Pennywort	<i>Hydrocotyle sp.</i>	FACW	-
		OBL	-
		OBL	T
Maypop	<i>Passiflora incarnata</i>	-	-
Southern Sandspur	<i>Cenchrus echinatus</i>	-	-
Camphor Weed	<i>Heterotheca subaxillaris</i>	FACU	-
Crowfoot Grass	<i>Dactyloctenium aegyptium</i>	-	-
White Sweet-clover	<i>Melilotus alba</i>	FACU	-
Bermuda Grass	<i>Cynodon dactylon</i>	FACU	-

Source: KBN Engineering and Applied Sciences, Inc., 1992.

Table H-4. Vegetation Observed at SWMU 5 (NIRP Site 6), NAVSTA Mayport
(January 1992) (Page 1 of 2)

Common Name	Scientific Name	USACE	DER
Common Beggar's-tick	<i>Bidens alba</i>	FACW	-
Pennywort	<i>Hydrocotyle</i> sp.	FACW	-
		OBL	-
		OBL	T
Bermuda Grass	<i>Cynodon dactylon</i>	FACU	-
Vasey Grass	<i>Paspalum urvillei</i>	FAC	-
Groundsel Bush	<i>Baccharis halimifolia</i>	FAC	-
Match-head	<i>Phyla nodiflora</i>	FACW	-
Camphor Weed	<i>Heterotheca subaxillaris</i>	FACU	-
Southern Dewberry	<i>Rubus trivialis</i>	FAC	-
Sand Cord Grass	<i>Spartina bakeri</i>	FACW	T
Beach Grass	<i>Panicum amarum</i>	FAC	-
Cabbage Palm	<i>Sabal palmetto</i>	FAC	I
Coastal Plain Willow	<i>Salix caroliniana</i>	OBL	S
Maypop	<i>Passiflora incarnata</i>	-	-
Southern Red Cedar	<i>Juniperus silicicola</i>	FAC	-
Sugarberry	<i>Celtis laevigata</i>	FACW	T
Bushy Broom Grass	<i>Andropogon glomeratus</i>	FACW	-
Saltmarsh Cord Grass	<i>Spartina alterniflora</i>	OBL	S
Seashore Paspalum	<i>Paspalum vaginatum</i>	OBL	S
Seaside Goldenrod	<i>Solidago sempervirens</i>	FACW	-
Chestnut Sedge	<i>Fimbristylis castanea</i>	OBL	S
Black Needle Rush	<i>Juncus roemerianus</i>	OBL	S
Hair Grass	<i>Muhlenbergia capillaris</i>	FACU	S
Dune Sandspur	<i>Cenchrus tribuloides</i>	FACU	-
Sea Oxeye	<i>Borrchia frutescens</i>	OBL	S
Perennial Glasswort	<i>Salicornia virginica</i>	OBL	S
Salt Grass	<i>Distichlis spicata</i>	FACW	S
Marsh Elder	<i>Iva frutescens</i>	FACW	S
Christmas Berry	<i>Lycium carolinianum</i>	FACW	-
Southern Cat-tail	<i>Typha domingensis</i>	OBL	S
Seashore Dropseed	<i>Sporobolus virginicus</i>	FACW	S
Slash Pine	<i>Pinus elliottii</i>	FACW	-
Flat-topped Goldenrod	<i>Euthamia tenuifolia</i>	FAC	-
Hercules'-club	<i>Zanthoxylum clava-herculis</i>	FAC	-
Tough Buckthorn	<i>Bumelia tenax</i>	-	-

Table H-4. Vegetation Observed at SWMU 5 (NIRP Site 6), NAVSTA Mayport
(January 1992) (Page 2 of 2)

Common Name	Scientific Name	USACE	DER
Date Palm	<i>Phoenix hybrid</i>	-	-
Elderberry	<i>Sambucus canadensis</i>	FACW	T
Cranesbill	<i>Geranium carolinianum</i>	-	-
Black Medic	<i>Medicago lupulina</i>	FACU	-
Common Dandelion	<i>Taraxacum officinale</i>	FACU	-
Common Chickweed	<i>Stellaria media</i>	FACU	-
Wax Myrtle	<i>Myrica cerifera</i>	FAC	U*
Live Oak	<i>Quercus virginiana</i>	FACU	-
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	FAC	-
Scuppernong	<i>Vitis rotundifolia</i>	FAC	-
Wild-bamboo	<i>Smilax auriculata</i>	FACU	-
Southern Fleabane	<i>Erigeron quercifolius</i>	FAC	-
Nuttall's Thistle	<i>Cirsium nuttallii</i>	FAC	-
Sharp-pod Morning-glory	<i>Ipomoea cordatotriloba</i>	FACU	-

Source: KBN Engineering and Applied Sciences, Inc., 1992.

Table H-5. Vegetation Observed at SWMU 13 (NIRP Site 13), NAVSTA Mayport
(January 1992)

Common Name	Scientific Name	USACE	DER
St. Augustine Grass	<i>Stenotaphrum secundatum</i>	FAC	-
Goose Grass	<i>Eleusine indica</i>	FACU	-
Bermuda Grass	<i>Cynodon dactylon</i>	FACU	-
Camphor Weed	<i>Heterotheca subaxillaris</i>	FACU	-
Black Medic	<i>Medicago lupulina</i>	FACU	-
Match-head	<i>Phyla nodiflora</i>	FACW	-
Coastal Plain Pennywort	<i>Hydrocotyle bonariensis</i>	FACW	-

Source: KBN Engineering and Applied Sciences, Inc., 1992.

APPENDIX D

LABORATORY DATA SUMMARY TABLES

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPTBSDDUP1DL		MPT-B-SW-1		MPTBSWDUP1	
LOCATION:		SOIL		SOIL		SOIL		WATER		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723		20723	
LAB NUMBER:		20723		20723		20723		20723		20723	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/l Conc.	Qual.
74-87-3	Chloromethane	14	U	32	U			10	U	10	U
74-83-9	Bromomethane	14	U	32	U			10	U	10	U
75-01-4	Vinyl chloride	14	U	32	U			10	U	10	U
75-00-3	Chloroethane	14	U	32	U			10	U	10	U
75-09-2	Methylene chloride	18	B	25	B			6	B	2	BJ
67-64-1	Acetone	8	BJ	95	B			5	BJ	5	BJ
75-15-0	Carbon disulfide	7	U	19	U			5	U	5	U
75-69-4	Trichlorofluoromethane	7	U	16	U			5	U	5	U
75-35-4	1,1-Dichloroethylene	7	U	16	U			5	U	5	U
75-34-3	1,1-Dichloroethane	7	U	16	U			5	U	5	U
540-59-0	1,2-Dichloroethene (total)	7	U	16	U			5	U	5	U
67-66-3	Chloroform	7	U	16	U			5	U	5	U
107-06-2	1,2-Dichloroethane	7	U	16	U			5	U	5	U
78-93-3	2-Butanone	14	B	39	B			8	BJ	10	B
71-55-6	1,1,1-Trichloroethane	7	U	16	U			5	U	5	U
56-23-5	Carbon tetrachloride	7	U	16	U			5	U	5	U
108-05-4	Vinyl acetate	14	U	32	U			10	U	10	U
75-27-4	Bromodichloromethane	7	U	16	U			5	U	5	U
78-87-5	1,2-Dichloropropane	7	U	16	U			5	U	5	U
10061-01-5	cis-1,3-Dichloropropene	7	U	16	U			5	U	5	U
79-01-6	Trichloroethene	7	U	16	U			5	U	5	U
124-48-1	Dibromochloromethane	7	U	16	U			5	U	5	U
79-00-5	1,1,2-Trichloroethane	7	U	16	U			5	U	5	U
71-43-2	Benzene	7	U	16	U			5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPT-B-SW-1		MPTBSWDUP1	
LOCATION:		SOIL		SOIL		WATER		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723	
LAB NUMBER:		20723		20723		20723		20723	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	7	U	16	U			5	U
110-75-8	2-Chloroethoxyvinylether	14	U	32	U			10	U
75-25-2	Bromoform	7	U	16	U			5	U
591-78-6	2-Hexanone	14	U	32	U			10	U
108-10-1	4-Methyl-2-Pentanone	14	U	32	U			10	U
127-18-4	Tetrachloroethene	7	U	16	U			5	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U	16	U			5	U
108-88-3	Toluene	7	U	16	U			5	U
108-90-7	Chlorobenzene	7	U	16	U			5	U
100-41-4	Ethylbenzene	7	U	16	U			5	U
100-42-5	Styrene	7	U	16	U			5	U
1330-20-7	Xylene (total)	7	U	16	U			5	U
541-73-1	1,3-Dichlorobenzene	7	U	16	U			5	U
106-46-7	1,4-Dichlorobenzene	7	U	16	U			5	U
95-50-1	1,2-Dichlorobenzene	7	U	16	U			5	U
107-02-8	Acrolein	140	U	320	U			100	U
74-88-4	Iodomethane	14	U	32	U			10	U
107-13-1	Acrylonitrile	140	U	320	U			100	U
74-95-3	Dibromomethane	7	U	16	U			5	U
97-63-2	Ethyl Methacrylate	7	U	16	U			5	U
96-18-4	1,2,3-Trichloropropane	7	U	16	U			5	U
110-57-6	trans-1,4-Dichloro-2-butene	7	U	16	U			5	U
75-05-8	Acetonitrile	140	U	320	U			100	U
107-05-1	3-Chloropropene	7	U	16	U			5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPTBSDDUP1DL		MPT-B-SW-1		MPTBSWDUP1	
LOCATION:		SOIL		SOIL		SOIL		WATER		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723		20723	
LAB NUMBER:		20723		20723		20723		20723		20723	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/l Conc.	Qual.
107-12-0	Propionitrile	140	U	320	U			100	U	100	U
126-98-7	Methacrylonitrile	7	U	16	U			5	U	5	U
123-91-1	1,4-Dioxane	270	U	650	U			200	U	200	U
80-62-6	Methyl methacrylate	14	U	32	U			10	U	10	U
106-93-4	1,2-Dibromoethane	7	U	16	U			5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	7	U	16	U			5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	14	U	32	U			10	U	10	U
76-01-7	Pentachloroethane	14	U	32	U			10	U	10	U
78-83-1	Isobutyl alcohol	270	U	650	U			200	U	200	U
126-99-8	Chloroprene	270	U	650	U			200	U	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDATA1.WK1		MPT-B-SW-2		MPT-B-SW-2		MPT-B-SW-3		MPT-2-SD-4	
LOCATION:		WATER		WATER		WATER		SOIL	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/22/92	
DATE SAMPLED:		20723		20723		20723		20722	
LAB NUMBER:		20723		20723		20723		20722	
CAS RN	Common name	µg/Kg	Qual.	µg/l	Qual.	µg/Kg	Qual.	µg/Kg	Qual.
74-87-3	Chloromethane	13	U	10	U	29	U	19	U
74-83-9	Bromomethane	13	U	10	U	29	U	19	U
75-01-4	Vinyl chloride	13	U	10	U	29	U	19	U
75-00-3	Chloroethane	13	U	10	U	29	U	19	U
75-09-2	Methylene chloride	21	B	4	BJ	29	B	12	B
67-64-1	Acetone	15	B	5	BJ	190	B	47	B
75-15-0	Carbon disulfide	7	U	5	U	83	U	24	U
75-69-4	Trichlorofluoromethane	7	U	5	U	14	U	9	U
75-35-4	1,1-Dichloroethylene	7	U	5	U	14	U	9	U
75-34-3	1,1-Dichloroethane	7	U	5	U	14	U	9	U
540-59-0	1,2-Dichloroethene (total)	7	U	5	U	14	U	9	U
67-66-3	Chloroform	7	U	5	U	14	U	9	U
107-06-2	1,2-Dichloroethane	7	U	5	U	14	U	9	U
78-93-3	2-Butanone	14	B	9	BJ	42	B	22	B
71-55-6	1,1,1-Trichloroethane	7	U	5	U	14	U	9	U
56-23-5	Carbon tetrachloride	7	U	5	U	14	U	9	U
108-05-4	Vinyl acetate	13	U	10	U	29	U	19	U
75-27-4	Bromodichloromethane	7	U	5	U	14	U	9	U
78-87-5	1,2-Dichloropropane	7	U	5	U	14	U	9	U
10061-01-5	cis-1,3-Dichloropropene	7	U	5	U	14	U	9	U
79-01-6	Trichloroethene	7	U	5	U	14	U	9	U
124-48-1	Dibromochloromethane	7	U	5	U	14	U	9	U
79-00-5	1,1,2-Trichloroethane	7	U	5	U	14	U	9	U
71-43-2	Benzene	7	U	5	U	14	U	9	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

CAS RN	Common name	MPT-B-SD-2		MPT-B-SW-2		MPT-B-SD-3		MPT-B-SW-3		MPT-2-SD-4	
		µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	7	U	5	U	14	U	5	U	9	U
110-75-8	2-Chloroethylvinylether	13	U	10	U	29	U	10	U	19	U
75-25-2	Bromoform	7	U	5	U	14	U	5	U	9	U
591-78-6	2-Hexanone	13	U	10	U	29	U	10	U	19	U
108-10-1	4-Methyl-2-Pentanone	13	U	10	U	29	U	10	U	19	U
127-18-4	Tetrachloroethene	7	U	5	U	14	U	5	U	9	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U	5	U	14	U	5	U	9	U
108-88-3	Toluene	3	J	5	U	14	U	5	U	9	U
108-90-7	Chlorobenzene	7	U	5	U	14	U	5	U	9	U
100-41-4	Ethylbenzene	7	U	5	U	14	U	5	U	9	U
100-42-5	Styrene	7	U	5	U	14	U	5	U	9	U
1330-20-7	Xylene (total)	7	U	5	U	14	U	5	U	9	U
541-73-1	1,3-Dichlorobenzene	7	U	5	U	14	U	5	U	9	U
106-46-7	1,4-Dichlorobenzene	7	U	5	U	14	U	5	U	9	U
95-50-1	1,2-Dichlorobenzene	7	U	5	U	14	U	5	U	9	U
107-02-8	Acrolein	130	U	100	U	290	U	100	U	190	U
74-88-4	Iodomethane	13	U	10	U	29	U	10	U	19	U
107-13-1	Acrylonitrile	130	U	100	U	290	U	100	U	190	U
74-95-3	Dibromomethane	7	U	5	U	14	U	5	U	9	U
97-63-2	Ethyl Methacrylate	7	U	5	U	14	U	5	U	9	U
96-18-4	1,2,3-Trichloropropane	7	U	5	U	14	U	5	U	9	U
110-57-6	trans-1,4-Dichloro-2-butene	7	U	5	U	14	U	5	U	9	U
75-05-8	Acetonitrile	130	U	100	U	290	U	100	U	190	U
107-05-1	3-Chloropropene	7	U	5	U	14	U	5	U	9	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SW-2	MPT-B-SW-2	MPT-B-SW-2	MPT-B-SW-3	MPT-2-SD-4
LOCATION:		SOIL	WATER	SOIL	WATER	SOIL
SAMPLE MATRIX:		01/21/92	01/21/92	01/21/92	01/21/92	01/22/92
DATE SAMPLED:		20723	20723	20723	20723	20722
LAB NUMBER:		20723	20723	20723	20723	20722
CAS RN	Common name	µg/Kg	µg/l	µg/Kg	µg/l	µg/Kg
		Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
107-12-0	Propionitrile	130 U	100 U	290 U	100 U	190 U
126-98-7	Methacrylonitrile	7 U	5 U	14 U	5 U	9 U
123-91-1	1,4-Dioxane	260 U	200 U	570 U	200 U	370 U
80-62-6	Methyl methacrylate	13 U	10 U	29 U	10 U	19 U
106-93-4	1,2-Dibromoethane	7 U	5 U	14 U	5 U	9 U
630-20-6	1,1,1,2-Tetrachloroethane	7 U	5 U	14 U	5 U	9 U
96-12-8	1,2-Dibromo-3-chloropropane	13 U	10 U	29 U	10 U	19 U
76-01-7	Pentachloroethane	13 U	10 U	29 U	10 U	19 U
78-83-1	Isobutyl alcohol	260 U	200 U	570 U	200 U	370 U
126-99-8	Chloroprene	260 U	200 U	570 U	200 U	370 U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722	
LAB NUMBER:					
UNITS:		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
74-87-3	Chloromethane			10	U
74-83-9	Bromomethane			10	U
75-01-4	Vinyl chloride			10	U
75-00-3	Chloroethane			10	U
75-09-2	Methylene chloride			2	J
67-64-1	Acetone			6	BJ
75-15-0	Carbon disulfide			5	U
75-69-4	Trichlorofluoromethane			5	U
75-35-4	1,1-Dichloroethylene			5	U
75-34-3	1,1-Dichloroethane			5	U
540-59-0	1,2-Dichloroethene (total)			5	U
67-66-3	Chloroform			5	U
107-06-2	1,2-Dichloroethane			5	U
78-93-3	2-Butanone			8	BJ
71-55-6	1,1,1-Trichloroethane			5	U
56-23-5	Carbon tetrachloride			5	U
108-05-4	Vinyl acetate			10	U
75-27-4	Bromodichloromethane			5	U
78-87-5	1,2-Dichloropropane			5	U
10061-01-5	cis-1,3-Dichloropropene			5	U
79-01-6	Trichloroethene			5	U
124-48-1	Dibromochloromethane			5	U
79-00-5	1,1,2-Trichloroethane			5	U
71-43-2	Benzene			5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL	MPT-2-SW-4
LOCATION:		SOIL	WATER
SAMPLE MATRIX:		01/22/92	01/22/92
DATE SAMPLED:		20722	20722
LAB NUMBER:			
UNITS:		µg/Kg	µg/l
CAS RN	Common name	Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene		5 U
110-75-8	2-Chloroethylvinylether		10 U
75-25-2	Bromoform		5 U
591-78-6	2-Hexanone		10 U
108-10-1	4-Methyl-2-Pentanone		10 U
127-18-4	Tetrachloroethene		5 U
79-34-5	1,1,2-Tetrachloroethane		5 U
108-88-3	Toluene		5 U
108-90-7	Chlorobenzene		5 U
100-41-4	Ethylbenzene		5 U
100-42-5	Styrene		5 U
1330-20-7	Xylene (total)		5 U
541-73-1	1,3-Dichlorobenzene		5 U
106-46-7	1,4-Dichlorobenzene		5 U
95-50-1	1,2-Dichlorobenzene		5 U
107-02-8	Acrolein		100 U
74-88-4	Iodomethane		10 U
107-13-1	Acrylonitrile		100 U
74-95-3	Dibromomethane		5 U
97-63-2	Ethyl Methacrylate		5 U
96-18-4	1,2,3-Trichloropropane		5 U
110-57-6	trans-1,4-Dichloro-2-butene		5 U
75-05-8	Acetonitrile		100 U
107-05-1	3-Chloropropene		5 U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722	
LAB NUMBER:					
UNITS:		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile			100	U
126-98-7	Methacrylonitrile			5	U
123-91-1	1,4-Dioxane			200	U
80-62-6	Methyl methacrylate			10	U
106-93-4	1,2-Dibromoethane			5	U
630-20-6	1,1,1,2-Tetrachloroethane			5	U
96-12-8	1,2-Dibromo-3-chloropropane			10	U
76-01-7	Pentachloroethane			10	U
78-83-1	Isobutyl alcohol			200	U
126-99-8	Chloroprene			200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SD-5	MPT-2-SD-5DL	MPT-2-SW-5	MPT-2-SD-6	MPT-2-SD-6DL	
LOCATION:		SOIL	SOIL	WATER	SOIL	SOIL	
SAMPLE MATRIX:		01/22/92	01/22/92	01/22/92	01/22/92	01/22/92	
DATE SAMPLED:		20722	20722	20722	20722	20722	
LAB NUMBER:		20722	20722	20722	20722	20722	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.
74-87-3	Chloromethane	23	U				
74-83-9	Bromomethane	23	U				
75-01-4	Vinyl chloride	23	U				
75-00-3	Chloroethane	23	U				
75-09-2	Methylene chloride	17	B	5	BJ	14	BJ
67-64-1	Acetone	110	B	6	BJ	18	BJ
75-15-0	Carbon disulfide	54		5	U	15	U
75-69-4	Trichlorofluoromethane	12	U	5	U	15	U
75-35-4	1,1-Dichloroethylene	12	U	5	U	15	U
75-34-3	1,1-Dichloroethane	12	U	5	U	15	U
540-59-0	1,2-Dichloroethene (total)	12	U	5	U	15	U
67-66-3	Chloroform	12	U	5	U	15	U
107-06-2	1,2-Dichloroethane	12	U	5	U	15	U
78-93-3	2-Butanone	28	B	7	BJ	30	U
71-55-6	1,1,1-Trichloroethane	12	U	5	U	15	U
56-23-5	Carbon tetrachloride	12	U	5	U	15	U
108-05-4	Vinyl acetate	23	U	10	U	30	U
75-27-4	Bromodichloromethane	12	U	5	U	15	U
78-87-5	1,2-Dichloropropane	12	U	5	U	15	U
10061-01-5	cis-1,3-Dichloropropene	12	U	5	U	15	U
79-01-6	Trichloroethene	12	U	5	U	15	U
124-48-1	Dibromochloromethane	12	U	5	U	15	U
79-00-5	1,1,2-Trichloroethane	12	U	5	U	15	U
71-43-2	Benzene	12	U	5	U	15	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPT\DAT2.WK1		MPT-2-SD-5	MPT-2-SD-5DL	MPT-2-SW-5	MPT-2-SD-6	MPT-2-SD-6DL	
LOCATION:		SOIL	SOIL	WATER	SOIL	SOIL	
SAMPLE MATRIX:		01/22/92	01/22/92	01/22/92	01/22/92	01/22/92	
DATE SAMPLED:		20722	20722	20722	20722	20722	
LAB NUMBER:		20722	20722	20722	20722	20722	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.
107-12-0	Propionitrile	230	U	100	U	300	U
126-98-7	Methacrylonitrile	12	U	5	U	15	U
123-91-1	1,4-Dioxane	470	U	200	U	610	U
80-62-6	Methyl methacrylate	23	U	10	U	30	U
106-93-4	1,2-Dibromoethane	12	U	5	U	15	U
630-20-6	1,1,1,2-Tetrachloroethane	12	U	5	U	15	U
96-12-8	1,2-Dibromo-3-chloropropane	23	U	10	U	30	U
76-01-7	Pentachloroethane	23	U	10	U	30	U
78-83-1	Isobutyl alcohol	470	U	200	U	610	U
126-99-8	Chloroprene	470	U	200	U	610	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL	
LOCATION:		WATER		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/22/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20722		20740		20740		20740		20740	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.
74-87-3	Chloromethane	10	U	14	U	15	U				
74-83-9	Bromomethane	10	U	14	U	15	U				
75-01-4	Vinyl chloride	10	U	14	U	15	U				
75-00-3	Chloroethane	10	U	14	U	15	U				
75-09-2	Methylene chloride	2	J	9	B	22	B				
67-64-1	Acetone	5	BJ	12	BJ	27	B				
75-15-0	Carbon disulfide	5	U	7	U	7	U				
75-69-4	Trichlorofluoromethane	5	U	7	U	7	U				
75-35-4	1,1-Dichloroethylene	5	U	7	U	7	U				
75-34-3	1,1-Dichloroethane	5	U	7	U	7	U				
540-59-0	1,2-Dichloroethene (total)	5	U	7	U	7	U				
67-66-3	Chloroform	5	U	7	U	7	U				
107-06-2	1,2-Dichloroethane	5	U	7	U	7	U				
78-93-3	2-Butanone	8	BJ	12	BJ	15	B				
71-55-6	1,1,1-Trichloroethane	5	U	7	U	7	U				
56-23-5	Carbon tetrachloride	5	U	7	U	7	U				
108-05-4	Vinyl acetate	10	U	14	U	15	U				
75-27-4	Bromodichloromethane	5	U	7	U	7	U				
78-87-5	1,2-Dichloropropane	5	U	7	U	7	U				
10061-01-5	cis-1,3-Dichloropropene	5	U	7	U	7	U				
79-01-6	Trichloroethene	5	U	7	U	7	U				
124-48-1	Dibromochloromethane	5	U	7	U	7	U				
79-00-5	1,1,2-Trichloroethane	5	U	7	U	7	U				
71-43-2	Benzene	5	U	7	U	7	U				

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL	
LOCATION:		WATER		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/22/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20722		20740		20740		20740		20740	
LAB NUMBER:		20722		20740		20740		20740		20740	
CAS RN	Common name	µg/l	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U	7	U	7	U				
110-75-8	2-Chloroethylvinylether	10	U	14	U	15	U				
75-25-2	Bromoform	5	U	7	U	7	U				
591-78-6	2-Hexanone	10	U	14	U	15	U				
108-10-1	4-Methyl-2-Pentanone	10	U	14	U	15	U				
127-18-4	Tetrachloroethene	5	U	7	U	7	U				
79-34-5	1,1,2,2-Tetrachloroethane	5	U	7	U	7	U				
108-88-3	Toluene	5	U	7	U	7	U				
108-90-7	Chlorobenzene	5	U	7	U	7	U				
100-41-4	Ethylbenzene	5	U	7	U	7	U				
100-42-5	Styrene	5	U	7	U	7	U				
1330-20-7	Xylene (total)	5	U	7	U	7	U				
541-73-1	1,3-Dichlorobenzene	5	U	7	U	7	U				
106-46-7	1,4-Dichlorobenzene	5	U	7	U	7	U				
95-50-1	1,2-Dichlorobenzene	5	U	7	U	7	U				
107-02-8	Acrolein	100	U	140	U	150	U				
74-88-4	Iodomethane	10	U	14	U	15	U				
107-13-1	Acrylonitrile	100	U	140	U	150	U				
74-95-3	Dibromomethane	5	U	7	U	7	U				
97-63-2	Ethyl Methacrylate	5	U	7	U	7	U				
96-18-4	1,2,3-Trichloropropane	5	U	7	U	7	U				
110-57-6	trans-1,4-Dichloro-2-butene	5	U	7	U	7	U				
75-05-8	Acetonitrile	100	U	140	U	150	U				
107-05-1	3-Chloropropene	5	U	7	U	7	U				

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL			
LOCATION:		WATER		SOIL		SOIL		SOIL		SOIL			
SAMPLE MATRIX:		01/22/92		01/23/92		01/23/92		01/23/92		01/23/92			
DATE SAMPLED:		20722		20740		20740		20740		20740			
LAB NUMBER:													
CAS RN	Common name	µg/l	Conc.	Qual.	µg/Kg	Conc.	Qual.	µg/Kg	Conc.	Qual.	µg/Kg	Conc.	Qual.
107-12-0	Propionitrile	100	U	U	140	U	U	150	U	U			
126-98-7	Methacrylonitrile	5	U	U	7	U	U	7	U	U			
123-91-1	1,4-Dioxane	200	U	U	290	U	U	300	U	U			
80-62-6	Methyl methacrylate	10	U	U	14	U	U	15	U	U			
106-93-4	1,2-Dibromoethane	5	U	U	7	U	U	7	U	U			
630-20-6	1,1,1,2-Tetrachloroethane	5	U	U	7	U	U	7	U	U			
96-12-8	1,2-Dibromo-3-chloropropane	10	U	U	14	U	U	15	U	U			
76-01-7	Pentachloroethane	10	U	U	14	U	U	15	U	U			
78-83-1	Isobutyl alcohol	200	U	U	290	U	U	300	U	U			
126-99-8	Chloroprene	200	U	U	290	U	U	300	U	U			

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
UNITS:		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
74-87-3	Chloromethane	10	U	10	U
74-83-9	Bromomethane	10	U	10	U
75-01-4	Vinyl chloride	10	U	10	U
75-00-3	Chloroethane	10	U	10	U
75-09-2	Methylene chloride	6	B	5	B
67-64-1	Acetone	7	BJ	7	BJ
75-15-0	Carbon disulfide	5	U	5	U
75-69-4	Trichlorofluoromethane	5	U	5	U
75-35-4	1,1-Dichloroethylene	5	U	5	U
75-34-3	1,1-Dichloroethane	5	U	5	U
540-59-0	1,2-Dichloroethene (total)	5	U	5	U
67-66-3	Chloroform	5	U	5	U
107-06-2	1,2-Dichloroethane	5	U	5	U
78-93-3	2-Butanone	9	BJ	10	B
71-55-6	1,1,1-Trichloroethane	5	U	5	U
56-23-5	Carbon tetrachloride	5	U	5	U
108-05-4	Vinyl acetate	10	U	10	U
75-27-4	Bromodichloromethane	5	U	5	U
78-87-5	1,2-Dichloropropane	5	U	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U	5	U
79-01-6	Trichloroethene	5	U	5	U
124-48-1	Dibromochloromethane	5	U	5	U
79-00-5	1,1,2-Trichloroethane	5	U	5	U
71-43-2	Benzene	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
CAS RN	Common name	µg/l Conc.	Qual.	µg/l Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U	5	U
110-75-8	2-Chloroethylvinylether	10	U	10	U
75-25-2	Bromoform	5	U	5	U
591-78-6	2-Hexanone	10	U	10	U
108-10-1	4-Methyl-2-Pentanone	10	U	10	U
127-18-4	Tetrachloroethene	5	U	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U	5	U
108-88-3	Toluene	5	U	5	U
108-90-7	Chlorobenzene	5	U	5	U
100-41-4	Ethylbenzene	5	U	5	U
100-42-5	Styrene	5	U	5	U
1330-20-7	Xylene (total)	5	U	5	U
541-73-1	1,3-Dichlorobenzene	5	U	5	U
106-46-7	1,4-Dichlorobenzene	5	U	5	U
95-50-1	1,2-Dichlorobenzene	5	U	5	U
107-02-8	Acrolein	100	U	100	U
74-88-4	Iodomethane	10	U	10	U
107-13-1	Acrylonitrile	100	U	100	U
74-95-3	Dibromomethane	5	U	5	U
97-63-2	Ethyl Methacrylate	5	U	5	U
96-18-4	1,2,3-Trichloropropane	5	U	5	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U	5	U
75-05-8	Acetonitrile	100	U	100	U
107-05-1	3-Chloropropene	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
UNITS:		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile	100	U	100	U
126-98-7	Methacrylonitrile	5	U	5	U
123-91-1	1,4-Dioxane	200	U	200	U
80-62-6	Methyl methacrylate	10	U	10	U
106-93-4	1,2-Dibromoethane	5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U	10	U
76-01-7	Pentachloroethane	10	U	10	U
78-83-1	Isobutyl alcohol	200	U	200	U
126-99-8	Chloroprene	200	U	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8		MPT-2-SD-9		MPT-2-SD-9DL		MPT-2-SW-9		MPT-13-SD-1	
LOCATION:		SOIL		SOIL		SOIL		WATER		SOIL	
SAMPLE MATRIX:		02/12/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20902		20740		20740		20740		20740	
LAB NUMBER:											
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/l		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
74-87-3	Chloromethane	19	U	12	U			10	U	14	U
74-83-9	Bromomethane	19	U	12	U			10	U	14	U
75-01-4	Vinyl chloride	19	U	12	U			10	U	14	U
75-00-3	Chloroethane	19	U	12	U			10	U	14	U
75-09-2	Methylene chloride	10	B	7	B			6		19	B
67-64-1	Acetone	15	BJ	8	BJ			7	BJ	12	BJ
75-15-0	Carbon disulfide	3	J	6	U			5	U	7	U
75-69-4	Trichlorofluoromethane	9	U	6	U			5	U	7	U
75-35-4	1,1-Dichloroethylene	9	U	6	U			5	U	7	U
75-34-3	1,1-Dichloroethane	9	U	6	U			5	U	7	U
540-59-0	1,2-Dichloroethene (total)	9	U	6	U			5	U	7	U
67-66-3	Chloroform	9	U	6	U			5	U	7	U
107-06-2	1,2-Dichloroethane	9	U	6	U			5	U	7	U
78-93-3	2-Butanone	19	U	10	BJ			10	B	13	BJ
71-55-6	1,1,1-Trichloroethane	9	U	6	U			5	U	7	U
56-23-5	Carbon tetrachloride	9	U	6	U			5	U	7	U
108-05-4	Vinyl acetate	19	U	12	U			10	U	14	U
75-27-4	Bromodichloromethane	9	U	6	U			5	U	7	U
78-87-5	1,2-Dichloropropane	9	U	6	U			5	U	7	U
10061-01-5	cis-1,3-Dichloropropene	9	U	6	U			5	U	7	U
79-01-6	Trichloroethene	9	U	6	U			5	U	7	U
124-48-1	Dibromochloromethane	9	U	6	U			5	U	7	U
79-00-5	1,1,2-Trichloroethane	9	U	6	U			5	U	7	U
71-43-2	Benzene	9	U	6	U			5	U	7	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8	MPT-2-SD-9	MPT-2-SD-9DL	MPT-2-SW-9	MPT-13-SD-1	
LOCATION:		SOIL	SOIL	SOIL	WATER	SOIL	
SAMPLE MATRIX:		02/12/92	01/23/92	01/23/92	01/23/92	01/23/92	
DATE SAMPLED:		20902	20740	20740	20740	20740	
LAB NUMBER:							
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	9	U	6	U	5	U
110-75-8	2-Chloroethylvinylether	19	U	12	U	10	U
75-25-2	Bromoform	9	U	6	U	5	U
591-78-6	2-Hexanone	19	U	12	U	10	U
108-10-1	4-Methyl-2-Pentanone	19	U	12	U	10	U
127-18-4	Tetrachloroethene	9	U	6	U	5	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U	6	U	5	U
108-88-3	Toluene	9	U	6	U	5	U
108-90-7	Chlorobenzene	9	U	6	U	5	U
100-41-4	Ethylbenzene	9	U	6	U	5	U
100-42-5	Styrene	9	U	6	U	5	U
1330-20-7	Xylene (total)	9	U	6	U	5	U
541-73-1	1,3-Dichlorobenzene	9	U	6	U	5	U
106-46-7	1,4-Dichlorobenzene	9	U	6	U	5	U
95-50-1	1,2-Dichlorobenzene	9	U	6	U	5	U
107-02-8	Acrolein	190	U	120	U	100	U
74-88-4	Iodomethane	19	U	12	U	10	U
107-13-1	Acrylonitrile	190	U	120	U	100	U
74-95-3	Dibromomethane	9	U	6	U	5	U
97-63-2	Ethyl Methacrylate	9	U	6	U	5	U
96-18-4	1,2,3-Trichloropropane	9	U	6	U	5	U
110-57-6	trans-1,4-Dichloro-2-butene	9	U	6	U	5	U
75-05-8	Acetonitrile	190	U	120	U	100	U
107-05-1	3-Chloropropene	9	U	6	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8	MPT-2-SD-9	MPT-2-SD-9DL	MPT-2-SW-9	MPT-13-SD-1	
LOCATION:		SOIL	SOIL	SOIL	WATER	SOIL	
SAMPLE MATRIX:		02/12/92	01/23/92	01/23/92	01/23/92	01/23/92	
DATE SAMPLED:		20902	20740	20740	20740	20740	
LAB NUMBER:							
UNITS:		µg/Kg	µg/Kg	µg/Kg	µg/l	µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile	1900	U	120	U	100	U
126-98-7	Methacrylonitrile	9	U	6	U	5	U
123-91-1	1,4-Dioxane	370	U	250	U	200	U
80-62-6	Methyl methacrylate	19	U	12	U	10	U
106-93-4	1,2-Dibromoethane	9	U	6	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	9	U	6	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	19	U	12	U	10	U
76-01-7	Pentachloroethane	19	U	12	U	10	U
78-83-1	Isobutyl alcohol	370	U	250	U	200	U
126-99-8	Chloroprene	370	U	250	U	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1

MPT-13-SD-1DL MPT-13-SD-2 MPT-13-SD-3 MPT-13-SD-3DL
 SOIL SOIL SOIL SOIL
 01/23/92 01/23/92 01/23/92 01/23/92
 20740 20740 20740 20740
 LOCATION: SOIL
 SAMPLE MATRIX: SOIL
 DATE SAMPLED: 01/23/92
 LAB NUMBER: 20740

CAS RN	Common name	MPT-13-SD-1DL		MPT-13-SD-2		MPT-13-SD-3		MPT-13-SD-3DL	
		µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
74-87-3	Chloromethane			13	U	14	U		
74-83-9	Bromomethane			13	U	14	U		
75-01-4	Vinyl chloride			13	U	14	U		
75-00-3	Chloroethane			13	U	14	U		
75-09-2	Methylene chloride			17	B	26	B		
67-64-1	Acetone			10	BJ	12	BJ		
75-15-0	Carbon disulfide			6	U	7	U		
75-69-4	Trichlorofluoromethane			6	U	7	U		
75-35-4	1,1-Dichloroethylene			6	U	7	U		
75-34-3	1,1-Dichloroethane			6	U	7	U		
540-59-0	1,2-Dichloroethene (total)			6	U	7	U		
67-66-3	Chloroform			6	U	7	U		
107-06-2	1,2-Dichloroethane			6	U	7	U		
78-93-3	2-Butanone			9	BJ	15	B		
71-55-6	1,1,1-Trichloroethane			6	U	7	U		
56-23-5	Carbon tetrachloride			6	U	7	U		
108-05-4	Vinyl acetate			13	U	14	U		
75-27-4	Bromodichloromethane			6	U	7	U		
78-87-5	1,2-Dichloropropane			6	U	7	U		
10061-01-5	cis-1,3-Dichloropropene			6	U	7	U		
79-01-6	Trichloroethene			6	U	7	U		
124-48-1	Dibromochloromethane			6	U	7	U		
79-00-5	1,1,2-Trichloroethane			6	U	7	U		
71-43-2	Benzene			6	U	7	U		

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL		MPT-13-SD-2		MPT-13-SD-3		MPT-13-SD-3DL	
LOCATION:		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740		20740		20740	
LAB NUMBER:									
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene			6	U	7	U		
110-75-8	2-Chloroethylvinylether			13	U	14	U		
75-25-2	Bromoform			6	U	7	U		
591-78-6	2-Hexanone			13	U	14	U		
108-10-1	4-Methyl-2-Pentanone			13	U	14	U		
127-18-4	Tetrachloroethene			6	U	7	U		
79-34-5	1,1,2,2-Tetrachloroethane			6	U	7	U		
108-88-3	Toluene			6	U	7	U		
108-90-7	Chlorobenzene			6	U	7	U		
100-41-4	Ethylbenzene			6	U	7	U		
100-42-5	Styrene			6	U	7	U		
1330-20-7	Xylene (total)			6	U	7	U		
541-73-1	1,3-Dichlorobenzene			6	U	7	U		
106-46-7	1,4-Dichlorobenzene			6	U	7	U		
95-50-1	1,2-Dichlorobenzene			6	U	7	U		
107-02-8	Acrolein			6	U	7	U		
74-88-4	Iodomethane			130	U	140	U		
107-13-1	Acrylonitrile			13	U	14	U		
74-95-3	Dibromomethane			130	U	140	U		
97-63-2	Ethyl Methacrylate			6	U	7	U		
96-18-4	1,2,3-Trichloropropane			6	U	7	U		
110-57-6	trans-1,4-Dichloro-2-butene			6	U	7	U		
75-05-8	Acetonitrile			6	U	7	U		
107-05-1	3-Chloropropene			130	U	140	U		
				6	U	7	U		

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL		MPT-13-SD-2		MPT-13-SD-3		MPT-13-SD-3DL	
LOCATION:		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740		20740		20740	
LAB NUMBER:									
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile			130	U	140	U		
126-98-7	Methacrylonitrile			6	U	7	U		
123-91-1	1,4-Dioxane			250	U	270	U		
80-62-6	Methyl methacrylate			13	U	14	U		
106-93-4	1,2-Dibromoethane			6	U	7	U		
630-20-6	1,1,1,2-Tetrachloroethane			6	U	7	U		
96-12-8	1,2-Dibromo-3-chloropropane			13	U	14	U		
76-01-7	Pentachloroethane			13	U	14	U		
78-83-1	Isobutyl alcohol			250	U	270	U		
126-99-8	Chloroprene			250	U	270	U		

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDATA4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS:		µg/l	
CAS RN	Common name	Conc.	Qual.
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene chloride	8	B
67-64-1	Acetone	9	B.J
75-15-0	Carbon disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethylene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon tetrachloride	5	U
108-05-4	Vinyl acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS:		µg/l	
CAS RN	Common name	Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U
110-75-8	2-Chloroethoxyvinylether	10	U
75-25-2	Bromoform	5	U
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
107-02-8	Acrolein	100	U
74-88-4	Iodomethane	10	U
107-13-1	Acrylonitrile	100	U
74-95-3	Dibromomethane	5	U
97-63-2	Ethyl Methacrylate	5	U
96-18-4	1,2,3-Trichloropropane	5	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U
75-05-8	Acetonitrile	100	U
107-05-1	3-Chloropropene	5	U

*Blank cells indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:IMPTDAT4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS:			
CAS RN	Common name	µg/l Conc.	Qual.
107-12-0	Propionitrile	100	U
126-98-7	Methacrylonitrile	5	U
123-91-1	1,4-Dioxane	200	U
80-62-6	Methyl methacrylate	10	U
106-93-4	1,2-Dibromoethane	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U
76-01-7	Pentachloroethane	10	U
78-83-1	Isobutyl alcohol	200	U
126-99-8	Chloroprene	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPTBSDDUP1DL		MPT-B-SW-1		MPTBSWDUP1	
LOCATION:		SOIL		SOIL		SOIL		WATER		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723		20723	
LAB NUMBER:											
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	440	U	650	U			10	U	10	U
108-95-2	Phenol	440	U	650	U			10	U	10	U
62-53-3	Aniline	440	U	650	U			10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	440	U	650	U			10	U	10	U
95-57-8	2-Chlorophenol	440	U	650	U			10	U	10	U
541-73-1	1,3-Dichlorobenzene	440	U	650	U			10	U	10	U
106-46-7	1,4-Dichlorobenzene	440	U	650	U			10	U	10	U
100-51-6	Benzyl alcohol	440	U	650	U			10	U	10	U
95-50-1	1,2-Dichlorobenzene	440	U	650	U			10	U	10	U
95-48-7	2-Methylphenol	440	U	650	U			10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	440	U	650	U			10	U	10	U
106-44-5	4-Methylphenol	440	U	650	U			10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	440	U	650	U			10	U	10	U
67-72-1	Hexachloroethane	440	U	650	U			10	U	10	U
98-95-3	Nitrobenzene	440	U	650	U			10	U	10	U
78-59-1	Isophorone	440	U	650	U			10	U	10	U
88-75-5	2-Nitrophenol	440	U	650	U			10	U	10	U
105-67-9	2,4-Dimethylphenol	440	U	650	U			10	U	10	U
65-75-0	Benzoic Acid	2100	U	3100	U			50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	440	U	650	U			10	U	10	U
120-83-2	2,4-Dichlorophenol	440	U	650	U			10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	440	U	650	U			10	U	10	U
91-20-3	Naphthalene	440	U	650	U			10	U	10	U
106-47-8	4-Chloroaniline	440	U	650	U			10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPTBSDDUP1DL		MPT-B-SW-1		MPTBSWDUP1	
LOCATION:		SOIL		SOIL		SOIL		WATER		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723		20723	
LAB NUMBER:											
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
87-68-3	Hexachlorobutadiene	440	U	650	U			10	U	10	U
59-50-7	4-Chloro-3-Methylphenol	440	U	650	U			10	U	10	U
91-57-6	2-Methylnaphthalene	440	U	650	U			10	U	10	U
77-47-4	Hexachlorocyclopentadiene	440	U	650	U			10	U	10	U
88-06-2	2,4,6-Trichlorophenol	440	U	650	U			10	U	10	U
95-95-4	2,4,5-Trichlorophenol	2100	U	3100	U			50	U	50	U
91-58-7	2-Chloronaphthalene	440	U	650	U			10	U	10	U
88-74-4	2-Nitroaniline	2100	U	3100	U			50	U	50	U
131-11-3	Dimethyl phthalate	440	U	650	U			10	U	10	U
208-96-8	Acenaphthylene	440	U	650	U			10	U	10	U
606-20-2	2,6-Dinitrotoluene	440	U	650	U			10	U	10	U
99-09-2	3-Nitroaniline	2100	U	3100	U			50	U	50	U
83-32-9	Acenaphthene	440	U	650	U			10	U	10	U
51-28-5	2,4-Dinitrophenol	2100	U	3100	U			50	U	50	U
100-02-7	4-Nitrophenol	2100	U	3100	U			50	U	50	U
132-64-9	Dibenzofuran	440	U	650	U			10	U	10	U
121-14-2	2,4-Dinitrotoluene	440	U	650	U			10	U	10	U
84-66-2	Diethyl phthalate	440	U	650	U			10	U	10	U
7005-72-3	4-Chlorophenyl phenyl ether	440	U	650	U			10	U	10	U
86-73-7	Fluorene	440	U	650	U			10	U	10	U
100-10-6	4-Nitroaniline	2100	U	3100	U			50	U	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	2100	U	3100	U			50	U	50	U
86-30-6	N-Nitrosodiphenylamine	440	U	650	U			10	U	10	U
122-66-7	1,2-Diphenylhydrazine	440	U	650	U			10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPT-B-SW-1		MPTBSDDUP1DL		MPTBSDDUP1	
LOCATION:		SOIL		SOIL		WATER		SOIL		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723		20723	
LAB NUMBER:		20723		20723		20723		20723		20723	
UNITS:		µg/Kg		µg/Kg		µg/l		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether	440	U	650	U			10	U	10	U
118-74-1	Hexachlorobenzene	440	U	650	U			10	U	10	U
87-86-5	Pentachlorophenol	2100	U	3100	U			50	U	50	U
85-01-8	Phenanthrene	440	U	650	U			10	U	10	U
120-12-7	Anthracene	440	U	650	U			10	U	10	U
84-74-2	Di-n-butyl phthalate	440	U	71	J			10	U	10	U
206-44-0	Fluoranthene	440	U	650	U			10	U	10	U
129-00-0	Pyrene	440	U	650	U			10	U	10	U
85-68-7	Butyl benzyl phthalate	440	U	650	U			10	U	10	U
91-94-1	3,3'-Dichlorobenzidine	440	U	650	U			10	U	10	U
56-55-3	Benzo[a]anthracene	880	U	1300	U			20	U	20	U
218-01-9	Chrysene	440	U	650	U			10	U	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	440	U	650	U			10	U	10	U
117-84-0	Di-n-octyl phthalate	440	U	650	U			10	U	10	U
205-99-2	Benzo[b]fluoranthene	440	U	650	U			10	U	10	U
207-08-9	Benzo[k]fluoranthene	440	U	650	U			10	U	10	U
50-32-8	Benzo[a]pyrene	440	U	650	U			10	U	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	440	U	650	U			10	U	10	U
53-70-3	Dibenz[a,h]anthracene	440	U	650	U			10	U	10	U
191-24-2	Benzo[ghi]perylene	440	U	650	U			10	U	10	U
109-06-8	2-Picoline	2100	U	3100	U			50	U	50	U
66-27-3	Methyl methanesulfonate	440	U	650	U			10	U	10	U
62-50-0	Ethyl methanesulfonate	440	U	650	U			10	U	10	U
98-86-2	Acetophenone	440	U	650	U			10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:IMPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPTBSDDUP1DL		MPT-B-SW-1		MPTBSWDUP1	
LOCATION:		SOIL		SOIL		SOIL		WATER		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723		20723	
LAB NUMBER:		20723		20723		20723		20723		20723	
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
100-75-4	N-Nitrosopiperidine	440	U	650	U			10	U		
122-09-8	Phenyl-tert-butylamine	2100	U	3100	U			50	U		
87-65-0	2,6-Dichlorophenol	440	U	650	U			10	U		
924-16-3	N-Nitrosodi-n-butylamine	440	U	650	U			10	U		
55-18-5	N-Nitrosodiethylamine	440	U	650	U			10	U		
930-55-2	N-Nitrosopyrrolidine	440	U	650	U			10	U		
92-87-5	Benzidine	2100	U	3100	U			10	U		
95-94-3	1,2,4,5-Tetrachlorobenzene	2100	U	3100	U			50	U		
608-93-5	Pentachlorobenzene	2100	U	3100	U			50	U		
134-32-7	1-Naphthylamine	2100	U	3100	U			50	U		
91-59-8	2-Naphthylamine	2100	U	3100	U			50	U		
58-90-2	2,3,4,6-Tetrachlorophenol	440	U	650	U			50	U		
122-39-4	Diphenylamine	440	U	650	U			10	U		
62-44-2	Phenacetin	440	U	650	U			10	U		
92-67-1	4-Aminobiphenyl	2100	U	3100	U			10	U		
82-68-8	Pentachloronitrobenzene	2100	U	3100	U			50	U		
23950-58-5	Pronamide	440	U	650	U			50	U		
60-11-7	p-(Dimethylamino)azobenzene	440	U	650	U			10	U		
57-97-6	7,12-Dimethylbenz[a]anthracene	440	U	650	U			10	U		
56-49-5	Methylcholanthrene	440	U	650	U			10	U		
110-86-1	Pyridine	2100	U	3100	U			10	U		
10595-95-6	N-Nitrosomethylethylamine	440	U	650	U			50	U		
59-89-2	N-Nitrosomorpholine	440	U	650	U			10	U		
95-53-4	o-Toluidine	440	U	650	U			10	U		

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPTBSDDUP1DL		MPT-B-SW-1		MPTBSWDUP1	
LOCATION:		SOIL		SOIL		SOIL		WATER		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723		20723	
LAB NUMBER:		20723		20723		20723		20723		20723	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/l Conc.	Qual.
108-39-4	3-Methylphenol	440	U	650	U			10	U	10	U
1888-71-7	Hexachloropropene	2100	U	3100	U			50	U	50	U
106-50-3	p-Phenylenediamine	2100	U	3100	U			50	U	50	U
94-59-7	Safrole	2100	U	3100	U			50	U	50	U
120-58-1	Isosafrole	2100	U	3100	U			50	U	50	U
130-15-4	1,4-Naphthoquinone	2100	U	3100	U			50	U	50	U
99-65-0	1,3-Dinitrobenzene	440	U	650	U			20	U	10	U
99-55-8	5-Nitro-o-toluidine	440	U	650	U			10	U	10	U
99-35-4	1,3,5-Trinitrobenzene	440	U	650	U			10	U	10	U
56-57-5	4-Nitroquinoline 1-oxide	440	U	650	U			10	U	10	U
91-80-5	Methapyrene	2100	U	3100	U			50	U	50	U
119-93-7	3,3'-Dimethylbenzidine	440	U	650	U			10	U	10	U
53-96-3	2-Acetylaminofluorene	440	U	650	U			10	U	10	U
70-30-4	Hexachlorophene	2100	U	3100	U			50	U	50	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-2	MPT-B-SW-2	MPT-B-SD-3	MPT-B-SW-3	MPT-2-SD-4
LOCATION:		SOIL	WATER	SOIL	WATER	SOIL
SAMPLE MATRIX:		01/21/92	01/21/92	01/21/92	01/21/92	01/22/92
DATE SAMPLED:		20723	20723	20723	20723	20722
LAB NUMBER:						
CAS RN	Common name	µg/Kg Conc.	µg/l Conc.	µg/Kg Conc.	µg/l Conc.	µg/Kg Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
62-75-9	N-Nitrosodimethylamine	430 U	10 U	610 U	10 U	550 U
108-95-2	Phenol	430 U	10 U	610 U	10 U	550 U
62-53-3	Aniline	430 U	10 U	610 U	10 U	550 U
111-44-4	bis(2-Chloroethyl)Ether	430 U	10 U	610 U	10 U	550 U
95-57-8	2-Chlorophenol	430 U	10 U	610 U	10 U	550 U
541-73-1	1,3-Dichlorobenzene	430 U	10 U	610 U	10 U	550 U
106-46-7	1,4-Dichlorobenzene	430 U	10 U	610 U	10 U	550 U
100-51-6	Benzyl alcohol	430 U	10 U	610 U	10 U	550 U
95-50-1	1,2-Dichlorobenzene	430 U	10 U	610 U	10 U	550 U
95-48-7	2-Methylphenol	430 U	10 U	610 U	10 U	550 U
39638-32-9	bis(2-chloroethyl)Ether	430 U	10 U	610 U	10 U	550 U
106-44-5	4-Methylphenol	430 U	10 U	610 U	10 U	550 U
621-64-7	N-Nitroso-Di-n-Propylamine	430 U	10 U	610 U	10 U	550 U
67-72-1	Hexachloroethane	430 U	10 U	610 U	10 U	550 U
98-95-3	Nitrobenzene	430 U	10 U	610 U	10 U	550 U
78-59-1	Isophorone	430 U	10 U	610 U	10 U	550 U
88-75-5	2-Nitrophenol	430 U	10 U	610 U	10 U	550 U
105-67-9	2,4-Dimethylphenol	430 U	10 U	610 U	10 U	550 U
65-75-0	Benzoic Acid	2100 U	50 U	3000 U	50 U	2700 U
111-91-1	Bis(2-chloroethoxy)methane	430 U	10 U	610 U	10 U	550 U
120-83-2	2,4-Dichlorophenol	430 U	10 U	610 U	10 U	550 U
120-82-1	1,2,4-Trichlorobenzene	430 U	10 U	610 U	10 U	550 U
91-20-3	Naphthalene	430 U	10 U	610 U	10 U	550 U
106-47-8	4-Chloroaniline	430 U	10 U	610 U	10 U	550 U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDATA1.WK1		MPT-B-SD-2		MPT-B-SW-2		MPT-B-SD-3		MPT-B-SW-3		MPT-2-SD-4	
LOCATION:		SOIL		WATER		SOIL		WATER		SOIL	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/22/92	
DATE SAMPLED:		20723		20723		20723		20723		20722	
LAB NUMBER:		20723		20723		20723		20723		20722	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.
87-68-3	Hexachlorobutadiene	430	U	10	U	610	U	10	U	550	U
59-50-7	4-Chloro-3-Methylphenol	430	U	10	U	610	U	10	U	550	U
91-57-6	2-Methylnaphthalene	430	U	10	U	610	U	10	U	550	U
77-47-4	Hexachlorocyclopentadiene	430	U	10	U	610	U	10	U	550	U
88-06-2	2,4,6-Trichlorophenol	430	U	10	U	610	U	10	U	550	U
95-95-4	2,4,5-Trichlorophenol	2100	U	50	U	3000	U	50	U	2700	U
91-58-7	2-Chloronaphthalene	430	U	10	U	610	U	10	U	550	U
88-74-4	2-Nitroaniline	2100	U	50	U	3000	U	50	U	2700	U
131-11-3	Dimethyl phthalate	430	U	10	U	610	U	10	U	550	U
208-96-8	Acenaphthylene	430	U	10	U	610	U	10	U	550	U
606-20-2	2,6-Dinitrotoluene	430	U	10	U	610	U	10	U	550	U
99-09-2	3-Nitroaniline	2100	U	50	U	3000	U	50	U	2700	U
83-32-9	Acenaphthene	430	U	10	U	610	U	10	U	550	U
51-28-5	2,4-Dinitrophenol	2100	U	50	U	3000	U	50	U	2700	U
100-02-7	4-Nitrophenol	2100	U	50	U	3000	U	50	U	2700	U
132-64-9	Dibenzofuran	430	U	10	U	610	U	10	U	550	U
121-14-2	2,4-Dinitrotoluene	430	U	10	U	610	U	10	U	550	U
84-66-2	Diethyl phthalate	430	U	10	U	610	U	10	U	550	U
7005-72-3	4-Chlorophenyl phenyl ether	430	U	10	U	610	U	10	U	550	U
86-73-7	Fluorene	430	U	10	U	610	U	10	U	550	U
100-10-6	4-Nitroaniline	2100	U	50	U	3000	U	50	U	2700	U
534-52-1	4,6-Dinitro-2-Methylphenol	2100	U	50	U	3000	U	50	U	2700	U
86-30-6	N-Nitrosodiphenylamine	430	U	10	U	610	U	10	U	550	U
122-66-7	1,2-Diphenylhydrazine	430	U	10	U	610	U	10	U	550	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-2	MPT-B-SW-2	MPT-B-SD-3	MPT-B-SW-3	MPT-2-SD-4
LOCATION:		SOIL	WATER	SOIL	WATER	SOIL
SAMPLE MATRIX:		01/21/92	01/21/92	01/21/92	01/21/92	01/22/92
DATE SAMPLED:		20723	20723	20723	20723	20722
LAB NUMBER:		20723	20723	20723	20723	20722
CAS RN	Common name	µg/Kg Conc.	µg/l Conc.	µg/Kg Conc.	µg/l Conc.	µg/Kg Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
101-55-3	4-Bromophenyl phenyl ether	430 U	10 U	610 U	10 U	550 U
118-74-1	Hexachlorobenzene	430 U	10 U	610 U	10 U	550 U
87-86-5	Pentachlorophenol	2100 U	50 U	3000 U	50 U	2700 U
85-01-8	Phenanthrene	430 U	10 U	610 U	10 U	550 U
120-12-7	Anthracene	430 U	10 U	610 U	10 U	550 U
84-74-2	Di-n-butyl phthalate	54 J	10 U	70 J	10 U	63 J
206-44-0	Fluoranthene	430 U	10 U	610 U	10 U	110 J
129-00-0	Pyrene	430 U	10 U	610 U	10 U	110 J
85-68-7	Butyl benzyl phthalate	430 U	10 U	610 U	10 U	550 U
91-94-1	3,3'-Dichlorobenzidine	870 U	20 U	1200 U	20 U	1100 U
56-55-3	Benzo[a]anthracene	430 U	10 U	610 U	10 U	61 J
218-01-9	Chrysene	430 U	10 U	610 U	10 U	94 J
117-81-7	Bis(2-ethylhexyl) phthalate	430 U	3 J	260 J	10 U	550 U
117-84-0	Di-n-octyl phthalate	430 U	10 U	610 U	10 U	550 U
205-99-2	Benzo[b]fluoranthene	430 U	10 U	610 U	10 U	550 U
207-08-9	Benzo[k]fluoranthene	430 U	10 U	610 U	10 U	550 U
50-32-8	Benzo[a]pyrene	430 U	10 U	610 U	10 U	550 U
193-39-5	Indeno(1,2,3-cd)pyrene	430 U	10 U	610 U	10 U	59 J
53-70-3	Dibenz[a,h]anthracene	430 U	10 U	610 U	10 U	550 U
191-24-2	Benzo[ghi]perylene	430 U	10 U	610 U	10 U	550 U
109-06-8	2-Picoline	2100 U	50 U	3000 U	50 U	2700 U
66-27-3	Methyl methanesulfonate	430 U	10 U	610 U	10 U	550 U
62-50-0	Ethyl methanesulfonate	430 U	10 U	610 U	10 U	550 U
98-86-2	Acetophenone	430 U	10 U	610 U	10 U	550 U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SW-2		MPT-B-SW-2		MPT-B-SW-3		MPT-B-SW-3		MPT-2-SD-4	
LOCATION:		WATER		WATER		SOIL		WATER		SOIL	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/22/92	
DATE SAMPLED:		20723		20723		20723		20723		20722	
LAB NUMBER:		20723		20723		20723		20723		20722	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.
100-75-4	N-Nitrosopiperidine	430	U	10	U	610	U	10	U	550	U
122-09-8	Phenyl-tert-butylamine	2100	U	50	U	3000	U	50	U	2700	U
87-65-0	2,6-Dichlorophenol	430	U	10	U	610	U	10	U	550	U
924-16-3	N-Nitrosodi-n-butylamine	430	U	10	U	610	U	10	U	550	U
55-18-5	N-Nitrosodiethylamine	430	U	10	U	610	U	10	U	550	U
930-55-2	N-Nitrosopyrrolidine	430	U	10	U	610	U	10	U	550	U
92-87-5	Benzidine	2100	U	50	U	3000	U	50	U	2700	U
95-94-3	1,2,4,5-Tetrachlorobenzene	2100	U	50	U	3000	U	50	U	2700	U
608-93-5	Pentachlorobenzene	2100	U	50	U	3000	U	50	U	2700	U
134-32-7	1-Naphthylamine	2100	U	50	U	3000	U	50	U	2700	U
91-59-8	2-Naphthylamine	2100	U	50	U	3000	U	50	U	2700	U
58-90-2	2,3,4,6-Tetrachlorophenol	430	U	10	U	610	U	10	U	550	U
122-39-4	Diphenylamine	430	U	10	U	610	U	10	U	550	U
62-44-2	Phenacetin	430	U	10	U	610	U	10	U	550	U
92-67-1	4-Aminobiphenyl	2100	U	50	U	3000	U	50	U	2700	U
82-68-8	Pentachloronitrobenzene	2100	U	50	U	3000	U	50	U	2700	U
23950-58-5	Pronamide	430	U	10	U	610	U	10	U	550	U
60-11-7	p-(Dimethylamino)azobenzene	430	U	10	U	610	U	10	U	550	U
57-97-6	7,12-Dimethylbenz[a]anthracene	430	U	10	U	610	U	10	U	550	U
56-49-5	Methylcholanthrene	430	U	10	U	610	U	10	U	550	U
110-86-1	Pyridine	2100	U	50	U	3000	U	50	U	2700	U
10595-95-6	N-Nitrosomethylethylamine	430	U	10	U	610	U	10	U	550	U
59-89-2	N-Nitrosomorpholine	430	U	10	U	610	U	10	U	550	U
95-53-4	o-Toluidine	430	U	10	U	610	U	10	U	550	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-2		MPT-B-SW-2		MPT-B-SD-3		MPT-B-SW-3		MPT-2-SD-4	
LOCATION:		SOIL		WATER		SOIL		WATER		SOIL	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92		01/22/92	
DATE SAMPLED:		20723		20723		20723		20723		20722	
LAB NUMBER:		20723		20723		20723		20723		20722	
UNITS:		µg/Kg		µg/l		µg/Kg		µg/l		µg/Kg	
CAS RN	Common name	Conc.	Qual.								
108-39-4	3-Methylphenol	430	U	10	U	610	U	10	U	550	U
1888-71-7	Hexachloropropene	2100	U	50	U	3000	U	50	U	2700	U
106-50-3	p-Phenylenediamine	2100	U	50	U	3000	U	50	U	2700	U
94-59-7	Safrole	2100	U	50	U	3000	U	50	U	2700	U
120-58-1	Isosafrole	2100	U	50	U	3000	U	50	U	2700	U
130-15-4	1,4-Naphthoquinone	2100	U	50	U	3000	U	50	U	2700	U
99-65-0	1,3-Dinitrobenzene	430	U	10	U	610	U	10	U	550	U
99-55-8	5-Nitro-o-toluidine	430	U	10	U	610	U	10	U	550	U
99-35-4	1,3,5-Trinitrobenzene	430	U	10	U	610	U	10	U	550	U
56-57-5	4-Nitroquinoline 1-oxide	430	U	10	U	610	U	10	U	550	U
91-80-5	Methapyrene	2100	U	50	U	3000	U	50	U	2700	U
119-93-7	3,3'-Dimethylbenzidine	430	U	10	U	610	U	10	U	550	U
53-96-3	2-Acetylaminofluorene	430	U	10	U	610	U	10	U	550	U
70-30-4	Hexachlorophene	2100	U	50	U	3000	U	50	U	2700	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722	
LAB NUMBER:					
UNITS:		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
62-75-9	N-Nitrosodimethylamine			10	U
108-95-2	Phenol			10	U
62-53-3	Aniline			10	U
111-44-4	bis(2-Chloroethyl)Ether			10	U
95-57-8	2-Chlorophenol			10	U
541-73-1	1,3-Dichlorobenzene			10	U
106-46-7	1,4-Dichlorobenzene			10	U
100-51-6	Benzyl alcohol			10	U
95-50-1	1,2-Dichlorobenzene			10	U
95-48-7	2-Methylphenol			10	U
39638-32-9	bis(2-chloroethyl)Ether			10	U
106-44-5	4-Methylphenol			10	U
621-64-7	N-Nitroso-Di-n-Propylamine			10	U
67-72-1	Hexachloroethane			10	U
98-95-3	Nitrobenzene			10	U
78-59-1	Isophorone			10	U
88-75-5	2-Nitrophenol			10	U
105-67-9	2,4-Dimethylphenol			10	U
65-75-0	Benzoic Acid			50	U
111-91-1	Bis(2-chloroethoxy)methane			10	U
120-83-2	2,4-Dichlorophenol			10	U
120-82-1	1,2,4-Trichlorobenzene			10	U
91-20-3	Naphthalene			10	U
106-47-8	4-Chloroaniline			10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722	
LAB NUMBER:					
UNITS:		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
87-68-3	Hexachlorobutadiene			10	U
59-50-7	4-Chloro-3-Methylphenol			10	U
91-57-6	2-Methylnaphthalene			10	U
77-47-4	Hexachlorocyclopentadiene			10	U
88-06-2	2,4,6-Trichlorophenol			10	U
95-95-4	2,4,5-Trichlorophenol			50	U
91-58-7	2-Chloronaphthalene			10	U
88-74-4	2-Nitroaniline			50	U
131-11-3	Dimethyl phthalate			10	U
208-96-8	Acenaphthylene			10	U
606-20-2	2,6-Dinitrotoluene			10	U
99-09-2	3-Nitroaniline			50	U
83-32-9	Acenaphthene			10	U
51-28-5	2,4-Dinitrophenol			50	U
100-02-7	4-Nitrophenol			50	U
132-64-9	Dibenzofuran			10	U
121-14-2	2,4-Dinitrotoluene			10	U
84-66-2	Diethyl phthalate			10	U
7005-72-3	4-Chlorophenyl phenyl ether			10	U
86-73-7	Fluorene			10	U
100-10-6	4-Nitroaniline			50	U
534-52-1	4,6-Dinitro-2-Methylphenol			50	U
86-30-6	N-Nitrosodiphenylamine			10	U
122-66-7	1,2-Diphenylhydrazine			10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722	
LAB NUMBER:					
UNITS:		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether			10	U
118-74-1	Hexachlorobenzene			10	U
87-86-5	Pentachlorophenol			50	U
85-01-8	Phenanthrene			10	U
120-12-7	Anthracene			10	U
84-74-2	Di-n-butyl phthalate			10	U
206-44-0	Fluoranthene			10	U
129-00-0	Pyrene			10	U
85-68-7	Butyl benzyl phthalate			10	U
91-94-1	3,3'-Dichlorobenzidine			20	U
56-55-3	Benzo[a]anthracene			10	U
218-01-9	Chrysene			10	U
117-81-7	Bis(2-ethylhexyl) phthalate			10	U
117-84-0	Di-n-octyl phthalate			10	U
205-99-2	Benzo[b]fluoranthene			10	U
207-08-9	Benzo[k]fluoranthene			10	U
50-32-8	Benzo[a]pyrene			10	U
193-39-5	Indeno(1,2,3-cd)pyrene			10	U
53-70-3	Dibenz[a,h]anthracene			10	U
191-24-2	Benzo[ghi]perylene			10	U
109-06-8	2-Picoline			50	U
66-27-3	Methyl methanesulfonate			10	U
62-50-0	Ethyl methanesulfonate			10	U
98-86-2	Acetophenone			10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722	
LAB NUMBER:					
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.
100-75-4	N-Nitrosopiperidine			10	U
122-09-8	Phenyl-tert-butylamine			50	U
87-65-0	2,6-Dichlorophenol			10	U
924-16-3	N-Nitrosodi-n-butylamine			10	U
55-18-5	N-Nitrosodiethylamine			10	U
930-55-2	N-Nitrosopyrrolidine			10	U
92-87-5	Benzidine			50	U
95-94-3	1,2,4,5-Tetrachlorobenzene			50	U
608-93-5	Pentachlorobenzene			50	U
134-32-7	1-Naphthylamine			50	U
91-59-8	2-Naphthylamine			50	U
58-90-2	2,3,4,6-Tetrachlorophenol			10	U
122-39-4	Diphenylamine			10	U
62-44-2	Phenacetin			10	U
92-67-1	4-Aminobiphenyl			50	U
82-68-8	Pentachloronitrobenzene			50	U
23950-58-5	Pronamide			10	U
60-11-7	p-(Dimethylamino)azobenzene			10	U
57-97-6	7,12-Dimethylbenz[a]anthracene			10	U
56-49-5	Methylcholanthrene			10	U
110-86-1	Pyridine			50	U
10595-95-6	N-Nitrosomethylethylamine			10	U
59-89-2	N-Nitrosomorpholine			10	U
95-53-4	o-Toluidine			10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722	
LAB NUMBER:					
UNITS:		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
108-39-4	3-Methylphenol			10	U
1888-71-7	Hexachloropropene			50	U
106-50-3	p-Phenylenediamine			50	U
94-59-7	Safrole			50	U
120-58-1	Isosafrole			50	U
130-15-4	1,4-Naphthoquinone			50	U
99-65-0	1,3-Dinitrobenzene			10	U
99-55-8	5-Nitro-o-toluidine			10	U
99-35-4	1,3,5-Trinitrobenzene			10	U
56-57-5	4-Nitroquinoline 1-oxide			10	U
91-80-5	Methapyrilene			50	U
119-93-7	3,3'-Dimethylbenzidine			10	U
53-96-3	2-Acetylaminofluorene			10	U
70-30-4	Hexachlorophene			50	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SD-5		MPT-2-SD-5DL		MPT-2-SW-5		MPT-2-SD-6		MPT-2-SD-6DL	
LOCATION:		SOIL		SOIL		WATER		SOIL		SOIL	
SAMPLE MATRIX:		01/22/92		01/22/92		01/22/92		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722		20722		20722		20722	
LAB NUMBER:		20722		20722		20722		20722		20722	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	690	U								
108-95-2	Phenol	690	U			10	U	940	U		
62-53-3	Aniline	690	U			10	U	940	U		
111-44-4	bis(2-Chloroethyl)Ether	690	U			10	U	940	U		
95-57-8	2-Chlorophenol	690	U			10	U	940	U		
541-73-1	1,3-Dichlorobenzene	690	U			10	U	940	U		
106-46-7	1,4-Dichlorobenzene	690	U			10	U	940	U		
100-51-6	Benzyl alcohol	690	U			10	U	940	U		
95-50-1	1,2-Dichlorobenzene	690	U			10	U	940	U		
95-48-7	2-Methylphenol	690	U			10	U	940	U		
39638-32-9	bis(2-chloroethyl)Ether	690	U			10	U	940	U		
106-44-5	4-Methylphenol	690	U			10	U	940	U		
621-64-7	N-Nitroso-Di-n-Propylamine	690	U			10	U	940	U		
67-72-1	Hexachloroethane	690	U			10	U	940	U		
98-95-3	Nitrobenzene	690	U			10	U	940	U		
78-59-1	Isophorone	690	U			10	U	940	U		
88-75-5	2-Nitrophenol	690	U			10	U	940	U		
105-67-9	2,4-Dimethylphenol	690	U			10	U	940	U		
65-75-0	Benzoic Acid	3300	U			50	U	4600	U		
111-91-1	Bis(2-chloroethoxy)methane	690	U			10	U	940	U		
120-83-2	2,4-Dichlorophenol	690	U			10	U	940	U		
120-82-1	1,2,4-Trichlorobenzene	690	U			10	U	940	U		
91-20-3	Naphthalene	690	U			10	U	940	U		
106-47-8	4-Chloroaniline	690	U			10	U	940	U		

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6	MPT-2-SD-7	MPT-2-SD-7A	MPT-2-SD-7DL	MPT-2-SD-7ADL	
LOCATION:		WATER	SOIL	SOIL	SOIL	SOIL	
SAMPLE MATRIX:		01/22/92	01/23/92	01/23/92	01/23/92	01/23/92	
DATE SAMPLED:		20722	20740	20740	20740	20740	
LAB NUMBER:							
CAS RN	Common name	µg/l	µg/Kg	µg/Kg	µg/Kg	µg/Kg	
		Conc.	Qual.	Conc.	Qual.	Conc.	
						Qual.	
62-75-9	N-Nitrosodimethylamine	10	U	520	U	490	U
108-95-2	Phenol	10	U	520	U	490	U
62-53-3	Aniline	10	U	520	U	490	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	520	U	490	U
95-57-8	2-Chlorophenol	10	U	520	U	490	U
541-73-1	1,3-Dichlorobenzene	10	U	520	U	490	U
106-46-7	1,4-Dichlorobenzene	10	U	520	U	490	U
100-51-6	Benzyl alcohol	10	U	520	U	490	U
95-50-1	1,2-Dichlorobenzene	10	U	520	U	490	U
95-48-7	2-Methylphenol	10	U	520	U	490	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	520	U	490	U
106-44-5	4-Methylphenol	10	U	520	U	490	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	520	U	490	U
67-72-1	Hexachloroethane	10	U	520	U	490	U
98-95-3	Nitrobenzene	10	U	520	U	490	U
78-59-1	Isophorone	10	U	520	U	490	U
88-75-5	2-Nitrophenol	10	U	520	U	490	U
105-67-9	2,4-Dimethylphenol	10	U	520	U	490	U
65-75-0	Benzoic Acid	50	U	2500	U	2400	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	520	U	490	U
120-83-2	2,4-Dichlorophenol	10	U	520	U	490	U
120-82-1	1,2,4-Trichlorobenzene	10	U	520	U	490	U
91-20-3	Naphthalene	10	U	520	U	490	U
106-47-8	4-Chloroaniline	10	U	520	U	490	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
UNITS:		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	10	U
108-95-2	Phenol	10	U	10	U
62-53-3	Aniline	10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	10	U
95-57-8	2-Chlorophenol	10	U	10	U
541-73-1	1,3-Dichlorobenzene	10	U	10	U
106-46-7	1,4-Dichlorobenzene	10	U	10	U
100-51-6	Benzyl alcohol	10	U	10	U
95-50-1	1,2-Dichlorobenzene	10	U	10	U
95-48-7	2-Methylphenol	10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	10	U
106-44-5	4-Methylphenol	10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	10	U
67-72-1	Hexachloroethane	10	U	10	U
98-95-3	Nitrobenzene	10	U	10	U
78-59-1	Isophorone	10	U	10	U
88-75-5	2-Nitrophenol	10	U	10	U
105-67-9	2,4-Dimethylphenol	10	U	10	U
65-75-0	Benzoic Acid	50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	10	U
120-83-2	2,4-Dichlorophenol	10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U	10	U
91-20-3	Naphthalene	10	U	10	U
106-47-8	4-Chloroaniline	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SD-5	MPT-2-SD-5DL	MPT-2-SW-5	MPT-2-SD-6	MPT-2-SD-6DL	
LOCATION:		SOIL	SOIL	WATER	SOIL	SOIL	
SAMPLE MATRIX:		01/22/92	01/22/92	01/22/92	01/22/92	01/22/92	
DATE SAMPLED:		20722	20722	20722	20722	20722	
LAB NUMBER:		20722	20722	20722	20722	20722	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.
100-75-4	N-Nitrosopiperidine	690	U				
122-09-8	Phenyl-tert-butylamine	3300	U				
87-65-0	2,6-Dichlorophenol	690	U	10	U	940	U
924-16-3	N-Nitrosodi-n-butylamine	690	U	50	U	4600	U
55-18-5	N-Nitrosodiethylamine	690	U	10	U	940	U
930-55-2	N-Nitrosopyrrolidine	690	U	10	U	940	U
92-87-5	Benzidine	3300	U	10	U	940	U
95-94-3	1,2,4,5-Tetrachlorobenzene	3300	U	50	U	4600	U
608-93-5	Pentachlorobenzene	3300	U	50	U	4600	U
134-32-7	1-Naphthylamine	3300	U	50	U	4600	U
91-59-8	2-Naphthylamine	3300	U	50	U	4600	U
58-90-2	2,3,4,6-Tetrachlorophenol	690	U	10	U	940	U
122-39-4	Diphenylamine	690	U	10	U	940	U
62-44-2	Phenacetin	690	U	10	U	940	U
92-67-1	4-Aminobiphenyl	3300	U	10	U	940	U
82-68-8	Pentachloronitrobenzene	3300	U	50	U	4600	U
23950-58-5	Pronamide	3300	U	50	U	4600	U
60-11-7	p-(Dimethylamino)azobenzene	690	U	10	U	940	U
57-97-6	7,12-Dimethylbenz[a]anthracene	690	U	10	U	940	U
56-49-5	Methylcholanthrene	690	U	10	U	940	U
110-86-1	Pyridine	3300	U	10	U	940	U
10595-95-6	N-Nitrosomethylethylamine	690	U	50	U	4600	U
59-89-2	N-Nitrosomorpholine	690	U	10	U	940	U
95-53-4	o-Toluidine	690	U	10	U	940	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SD-5	MPT-2-SW-5	MPT-2-SD-6	MPT-2-SD-6DL
LOCATION:		SOIL	WATER	SOIL	SOIL
SAMPLE MATRIX:		01/22/92	01/22/92	01/22/92	01/22/92
DATE SAMPLED:		20722	20722	20722	20722
LAB NUMBER:		20722	20722	20722	20722
CAS RN	Common name	µg/Kg Conc.	µg/l Conc.	µg/Kg Conc.	µg/Kg Conc.
		Qual.	Qual.	Qual.	Qual.
108-39-4	3-Methylphenol	690 U	10 U	940 U	
1888-71-7	Hexachloropropene	3300 U	50 U	4600 U	
106-50-3	p-Phenylenediamine	3300 U	50 U	4600 U	
94-59-7	Safrole	3300 U	50 U	4600 U	
120-58-1	Isosafrole	3300 U	50 U	4600 U	
130-15-4	1,4-Naphthoquinone	3300 U	50 U	4600 U	
99-65-0	1,3-Dinitrobenzene	690 U	10 U	940 U	
99-55-8	5-Nitro-o-toluidine	690 U	10 U	940 U	
99-35-4	1,3,5-Trinitrobenzene	690 U	10 U	940 U	
56-57-5	4-Nitroquinoline 1-oxide	690 U	10 U	940 U	
91-80-5	Methapyrene	3300 U	50 U	4600 U	
119-93-7	3,3'-Dimethylbenzidine	690 U	10 U	940 U	
53-96-3	2-Acetylaminofluorene	690 U	10 U	940 U	
70-30-4	Hexachlorophene	3300 U	50 U	4600 U	

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTIDAT2.WK1		MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL	
LOCATION:		WATER		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/22/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20722		20740		20740		20740		20740	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	520	U	490	U				
108-95-2	Phenol	10	U	520	U	490	U				
62-53-3	Aniline	10	U	520	U	490	U				
111-44-4	bis(2-Chloroethyl)Ether	10	U	520	U	490	U				
95-57-8	2-Chlorophenol	10	U	520	U	490	U				
541-73-1	1,3-Dichlorobenzene	10	U	520	U	490	U				
106-46-7	1,4-Dichlorobenzene	10	U	520	U	490	U				
100-51-6	Benzyl alcohol	10	U	520	U	490	U				
95-50-1	1,2-Dichlorobenzene	10	U	520	U	490	U				
95-48-7	2-Methylphenol	10	U	520	U	490	U				
39638-32-9	bis(2-chloroethyl)Ether	10	U	520	U	490	U				
106-44-5	4-Methylphenol	10	U	520	U	490	U				
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	520	U	490	U				
67-72-1	Hexachloroethane	10	U	520	U	490	U				
98-95-3	Nitrobenzene	10	U	520	U	490	U				
78-59-1	Isophorone	10	U	520	U	490	U				
88-75-5	2-Nitrophenol	10	U	520	U	490	U				
105-67-9	2,4-Dimethylphenol	10	U	520	U	490	U				
65-75-0	Benzoic Acid	50	U	2500	U	2400	U				
111-91-1	Bis(2-chloroethoxy)methane	10	U	520	U	490	U				
120-83-2	2,4-Dichlorophenol	10	U	520	U	490	U				
120-82-1	1,2,4-Trichlorobenzene	10	U	520	U	490	U				
91-20-3	Naphthalene	10	U	520	U	490	U				
106-47-8	4-Chloroaniline	10	U	520	U	490	U				

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL			
LOCATION:		WATER		SOIL		SOIL		SOIL		SOIL			
SAMPLE MATRIX:		01/22/92		01/23/92		01/23/92		01/23/92		01/23/92			
DATE SAMPLED:		20722		20740		20740		20740		20740			
LAB NUMBER:													
CAS RN	Common name	µg/l	Conc.	Qual.	µg/Kg	Conc.	Qual.	µg/Kg	Conc.	Qual.	µg/Kg	Conc.	Qual.
87-68-3	Hexachlorobutadiene	10	U	U	520	U	U	490	U	U			
59-50-7	4-Chloro-3-Methylphenol	10	U	U	520	U	U	490	U	U			
91-57-6	2-Methylnaphthalene	10	U	U	520	U	U	490	U	U			
77-47-4	Hexachlorocyclopentadiene	10	U	U	520	U	U	490	U	U			
88-06-2	2,4,6-Trichlorophenol	10	U	U	520	U	U	490	U	U			
95-95-4	2,4,5-Trichlorophenol	50	U	U	2500	U	U	2400	U	U			
91-58-7	2-Chloronaphthalene	10	U	U	520	U	U	490	U	U			
88-74-4	2-Nitroaniline	50	U	U	2500	U	U	2400	U	U			
131-11-3	Dimethyl phthalate	10	U	U	520	U	U	490	U	U			
208-96-8	Acenaphthylene	10	U	U	520	U	U	490	U	U			
606-20-2	2,6-Dinitrotoluene	10	U	U	520	U	U	490	U	U			
99-09-2	3-Nitroaniline	50	U	U	2500	U	U	2400	U	U			
83-32-9	Acenaphthene	10	U	U	520	U	U	490	U	U			
51-28-5	2,4-Dinitrophenol	50	U	U	2500	U	U	2400	U	U			
100-02-7	4-Nitrophenol	50	U	U	2500	U	U	2400	U	U			
132-64-9	Dibenzofuran	10	U	U	520	U	U	490	U	U			
121-14-2	2,4-Dinitrotoluene	10	U	U	520	U	U	490	U	U			
84-66-2	Diethyl phthalate	10	U	U	520	U	U	490	U	U			
7005-72-3	4-Chlorophenyl phenyl ether	10	U	U	520	U	U	490	U	U			
86-73-7	Fluorene	10	U	U	520	U	U	490	U	U			
100-10-6	4-Nitroaniline	50	U	U	2500	U	U	2400	U	U			
534-52-1	4,6-Dinitro-2-Methylphenol	50	U	U	2500	U	U	2400	U	U			
86-30-6	N-Nitrosodiphenylamine	10	U	U	520	U	U	490	U	U			
122-66-7	1,2-Diphenylhydrazine	10	U	U	520	U	U	490	U	U			

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL	
LOCATION:		WATER		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/22/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20722		20740		20740		20740		20740	
LAB NUMBER:											
UNITS:		µg/l		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether	10	U	520	U	490	U				
118-74-1	Hexachlorobenzene	10	U	520	U	490	U				
87-86-5	Pentachlorophenol	50	U	430	J	2400	U				
85-01-8	Phenanthrene	10	U	520	U	490	U				
120-12-7	Anthracene	10	U	520	U	490	U				
84-74-2	Di-n-butyl phthalate	10	U	520	BU	57	BJ				
206-44-0	Fluoranthene	10	U	520	U	490	U				
129-00-0	Pyrene	10	U	520	U	490	U				
85-68-7	Butyl benzyl phthalate	10	U	520	U	490	U				
91-94-1	3,3'-Dichlorobenzidine	10	U	520	U	490	U				
56-55-3	Benzo[a]anthracene	20	U	1000	U	490	U				
218-01-9	Chrysene	10	U	520	U	490	U				
117-81-7	Bis(2-ethylhexyl) phthalate	10	U	160	J	120	J				
117-84-0	Di-n-octyl phthalate	10	U	520	U	490	U				
205-99-2	Benzo[b]fluoranthene	10	U	520	U	490	U				
207-08-9	Benzo[k]fluoranthene	10	U	520	U	490	U				
50-32-8	Benzo[a]pyrene	10	U	520	U	490	U				
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	520	U	490	U				
53-70-3	Dibenz[a,h]anthracene	10	U	520	U	490	U				
191-24-2	Benzo[ghi]perylene	10	U	520	U	490	U				
109-06-8	2-Picoline	50	U	2500	U	2400	U				
66-27-3	Methyl methanesulfonate	10	U	520	U	490	U				
62-50-0	Ethyl methanesulfonate	10	U	520	U	490	U				
98-86-2	Acetophenone	10	U	520	U	490	U				

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

CAS RN	Common name	MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL	
		WATER	SOIL	WATER	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
		µg/l		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
A:\MPTDAT2.WK1											
	LOCATION:										
	SAMPLE MATRIX:										
	DATE SAMPLED:	01/22/92		01/23/92		01/23/92		01/23/92		01/23/92	
	LAB NUMBER:	20722		20740		20740		20740		20740	
	UNITS:										
	Common name										
100-75-4	N-Nitrosopiperidine	10	U	520	U	490	U				
122-09-8	Phenyl-tert-butylamine	50	U	2500	U	2400	U				
87-65-0	2,6-Dichlorophenol	10	U	520	U	490	U				
924-16-3	N-Nitrosodi-n-butylamine	10	U	520	U	490	U				
55-18-5	N-Nitrosodiethylamine	10	U	520	U	490	U				
930-55-2	N-Nitrosopyrrolidine	10	U	520	U	490	U				
92-87-5	Benzidine	50	U	2500	U	2400	U				
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U	2500	U	2400	U				
608-93-5	Pentachlorobenzene	50	U	2500	U	2400	U				
134-32-7	1-Naphthylamine	50	U	2500	U	2400	U				
91-59-8	2-Naphthylamine	50	U	2500	U	2400	U				
58-90-2	2,3,4,6-Tetrachlorophenol	10	U	520	U	490	U				
122-39-4	Diphenylamine	10	U	520	U	490	U				
62-44-2	Phenacetin	10	U	520	U	490	U				
92-67-1	4-Aminobiphenyl	50	U	2500	U	2400	U				
82-68-8	Pentachloronitrobenzene	50	U	2500	U	2400	U				
23950-58-5	Pronamide	10	U	520	U	490	U				
60-11-7	p-(Dimethylamino)azobenzene	10	U	520	U	490	U				
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U	520	U	490	U				
56-49-5	Methylcholanthrene	10	U	520	U	490	U				
110-86-1	Pyridine	50	U	2500	U	2400	U				
10595-95-6	N-Nitrosomethylethylamine	10	U	520	U	490	U				
59-89-2	N-Nitrosomorpholine	10	U	520	U	490	U				
95-53-4	o-Toluidine	10	U	520	U	490	U				

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL	
LOCATION:		WATER		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/22/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20722		20740		20740		20740		20740	
LAB NUMBER:											
UNITS:		µg/l		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
108-39-4	3-Methylphenol	10	U	520	U	490	U				
1888-71-7	Hexachloropropene	50	U	2500	U	2400	U				
106-50-3	p-Phenylenediamine	50	U	2500	U	2400	U				
94-59-7	Safrole	50	U	2500	U	2400	U				
120-58-1	Isosafrole	50	U	2500	U	2400	U				
130-15-4	1,4-Naphthoquinone	50	U	2500	U	2400	U				
99-65-0	1,3-Dinitrobenzene	10	U	520	U	490	U				
99-55-8	5-Nitro-o-toluidine	10	U	520	U	490	U				
99-35-4	1,3,5-Trinitrobenzene	10	U	520	U	490	U				
56-57-5	4-Nitroquinoline 1-oxide	10	U	520	U	490	U				
91-80-5	Methapyrilene	50	U	2500	U	2400	U				
119-93-7	3,3'-Dimethylberzidine	10	U	520	U	490	U				
53-96-3	2-Acetylaminofluorene	10	U	520	U	490	U				
70-30-4	Hexachlorophene	50	U	2500	U	2400	U				

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
CAS RN	Common name	µg/l		µg/l	
		Conc.	Qual.	Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	10	U
108-95-2	Phenol	10	U	10	U
62-53-3	Aniline	10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	10	U
95-57-8	2-Chlorophenol	10	U	10	U
541-73-1	1,3-Dichlorobenzene	10	U	10	U
106-46-7	1,4-Dichlorobenzene	10	U	10	U
100-51-6	Benzyl alcohol	10	U	10	U
95-50-1	1,2-Dichlorobenzene	10	U	10	U
95-48-7	2-Methylphenol	10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	10	U
106-44-5	4-Methylphenol	10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	10	U
67-72-1	Hexachloroethane	10	U	10	U
98-95-3	Nitrobenzene	10	U	10	U
78-59-1	Isophorone	10	U	10	U
88-75-5	2-Nitrophenol	10	U	10	U
105-67-9	2,4-Dimethylphenol	10	U	10	U
65-75-0	Benzoic Acid	50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	10	U
120-83-2	2,4-Dichlorophenol	10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U	10	U
91-20-3	Naphthalene	10	U	10	U
106-47-8	4-Chloroaniline	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
UNITS:		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
87-68-3	Hexachlorobutadiene	10	U	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U	10	U
91-57-6	2-Methylnaphthalene	10	U	10	U
77-47-4	Hexachlorocyclopentadiene	10	U	10	U
88-06-2	2,4,6-Trichlorophenol	10	U	10	U
95-95-4	2,4,5-Trichlorophenol	50	U	50	U
91-58-7	2-Chloronaphthalene	10	U	10	U
88-74-4	2-Nitroaniline	50	U	50	U
131-11-3	Dimethyl phthalate	10	U	10	U
208-96-8	Acenaphthylene	10	U	10	U
606-20-2	2,6-Dinitrotoluene	10	U	10	U
99-09-2	3-Nitroaniline	50	U	50	U
83-32-9	Acenaphthene	10	U	10	U
51-28-5	2,4-Dinitrophenol	50	U	50	U
100-02-7	4-Nitrophenol	50	U	50	U
132-64-9	Dibenzofuran	10	U	10	U
121-14-2	2,4-Dinitrotoluene	10	U	10	U
84-66-2	Diethyl phthalate	10	U	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U	10	U
86-73-7	Fluorene	10	U	10	U
100-10-6	4-Nitroaniline	50	U	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U	50	U
86-30-6	N-Nitrosodiphenylamine	10	U	10	U
122-66-7	1,2-Diphenylhydrazine	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
UNITS:		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether	10	U	10	U
118-74-1	Hexachlorobenzene	10	U	10	U
87-86-5	Pentachlorophenol	50	U	50	U
85-01-8	Phenanthrene	10	U	10	U
120-12-7	Anthracene	10	U	10	U
84-74-2	Di-n-butyl phthalate	2	BJ	16	B
206-44-0	Fluoranthene	10	U	10	U
129-00-0	Pyrene	10	U	10	U
85-68-7	Butyl benzyl phthalate	10	U	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U	20	U
56-55-3	Benzo[a]anthracene	10	U	10	U
218-01-9	Chrysene	10	U	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	3	J	10	U
117-84-0	Di-n-octyl phthalate	10	U	10	U
205-99-2	Benzo[b]fluoranthene	10	U	10	U
207-08-9	Benzo[k]fluoranthene	10	U	10	U
50-32-8	Benzo[a]pyrene	10	U	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	10	U
53-70-3	Dibenz[a,h]anthracene	10	U	10	U
191-24-2	Benzo[ghi]perylene	10	U	10	U
109-06-8	2-Picoline	50	U	50	U
66-27-3	Methyl methanesulfonate	10	U	10	U
62-50-0	Ethyl methanesulfonate	10	U	10	U
98-86-2	Acetophenone	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
CAS RN	Common name	µg/l Conc.	Qual.	µg/l Conc.	Qual.
100-75-4	N-Nitrosopiperidine	10	U	10	U
122-09-8	Phenyl-tert-butylamine	50	U	50	U
87-65-0	2,6-Dichlorophenol	10	U	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U	10	U
55-18-5	N-Nitrosodiethylamine	10	U	10	U
930-55-2	N-Nitrosopyrrolidine	10	U	10	U
92-87-5	Benzidine	50	U	50	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U	50	U
608-93-5	Pentachlorobenzene	50	U	50	U
134-32-7	1-Naphthylamine	50	U	50	U
91-59-8	2-Naphthylamine	50	U	50	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U	10	U
122-39-4	Diphenylamine	10	U	10	U
62-44-2	Phenacetin	10	U	10	U
92-67-1	4-Aminobiphenyl	50	U	50	U
82-68-8	Pentachloronitrobenzene	50	U	50	U
23950-58-5	Pronamide	10	U	10	U
60-11-7	p-(Dimethylamino)azobenzene	10	U	10	U
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U	10	U
56-49-5	Methylcholanthrene	10	U	10	U
110-86-1	Pyridine	50	U	50	U
10595-95-6	N-Nitrosomethylethylamine	10	U	10	U
59-89-2	N-Nitrosomorpholine	10	U	10	U
95-53-4	o-Toluidine	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
UNITS:		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
108-39-4	3-Methylphenol	10	U	10	U
1888-71-7	Hexachloropropene	50	U	50	U
106-50-3	p-Phenylenediamine	50	U	50	U
94-59-7	Safrole	50	U	50	U
120-58-1	Isosafrole	50	U	50	U
130-15-4	1,4-Naphthoquinone	50	U	50	U
99-65-0	1,3-Dinitrobenzene	10	U	10	U
99-55-8	5-Nitro-o-toluidine	10	U	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U	10	U
56-57-5	4-Nitroquinoline 1-oxide	10	U	10	U
91-80-5	Methapyrilene	50	U	50	U
119-93-7	3,3'-Dimethylbenzidine	10	U	10	U
53-96-3	2-Acetylaminofluorene	10	U	10	U
70-30-4	Hexachlorophene	50	U	50	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8	MPT-2-SD-9	MPT-2-SD-9DL	MPT-2-SW-9	MPT-13-SD-1	
LOCATION:		SOIL	SOIL	SOIL	WATER	SOIL	
SAMPLE MATRIX:		02/12/92	01/23/92	01/23/92	01/23/92	01/23/92	
DATE SAMPLED:		20902	20740	20740	20740	20740	
LAB NUMBER:							
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	520	U	410	U	10	U
108-95-2	Phenol	520	U	410	U	10	U
62-53-3	Aniline	520	U	410	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	520	U	410	U	10	U
95-57-8	2-Chlorophenol	520	U	410	U	10	U
541-73-1	1,3-Dichlorobenzene	520	U	410	U	10	U
106-46-7	1,4-Dichlorobenzene	520	U	410	U	10	U
100-51-6	Benzyl alcohol	520	U	410	U	10	U
95-50-1	1,2-Dichlorobenzene	520	U	410	U	10	U
95-48-7	2-Methylphenol	520	U	410	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	520	U	410	U	10	U
106-44-5	4-Methylphenol	520	U	410	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	520	U	410	U	10	U
67-72-1	Hexachloroethane	520	U	410	U	10	U
98-95-3	Nitrobenzene	520	U	410	U	10	U
78-59-1	Isophorone	520	U	410	U	10	U
88-75-5	2-Nitrophenol	520	U	410	U	10	U
105-67-9	2,4-Dimethylphenol	520	U	410	U	10	U
65-75-0	Benzoic Acid	2500	U	2000	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	520	U	410	U	10	U
120-83-2	2,4-Dichlorophenol	520	U	410	U	10	U
120-82-1	1,2,4-Trichlorobenzene	520	U	410	U	10	U
91-20-3	Naphthalene	520	U	410	U	10	U
106-47-8	4-Chloroaniline	520	U	410	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8		MPT-2-SD-9		MPT-2-SD-9DL		MPT-2-SW-9		MPT-13-SD-1	
LOCATION:		SOIL		SOIL		SOIL		WATER		SOIL	
SAMPLE MATRIX:		02/12/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20902		20740		20740		20740		20740	
LAB NUMBER:											
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/l		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
87-68-3	Hexachlorobutadiene	520	U	410	U			10	U	430	U
59-50-7	4-Chloro-3-Methylphenol	520	U	410	U			10	U	430	U
91-57-6	2-Methylnaphthalene	520	U	410	U			10	U	430	U
77-47-4	Hexachlorocyclopentadiene	520	U	410	U			10	U	430	U
88-06-2	2,4,6-Trichlorophenol	520	U	410	U			10	U	430	U
95-95-4	2,4,5-Trichlorophenol	2500	U	2000	U			50	U	2100	U
91-58-7	2-Chloronaphthalene	520	U	410	U			10	U	430	U
88-74-4	2-Nitroaniline	2500	U	2000	U			50	U	2100	U
131-11-3	Dimethyl phthalate	520	U	410	U			10	U	430	U
208-96-8	Acenaphthylene	520	U	410	U			10	U	430	U
606-20-2	2,6-Dinitrotoluene	520	U	410	U			10	U	430	U
99-09-2	3-Nitroaniline	2500	U	2000	U			50	U	2100	U
83-32-9	Acenaphthene	520	U	410	U			10	U	430	U
51-28-5	2,4-Dinitrophenol	2500	U	2000	U			50	U	2100	U
100-02-7	4-Nitrophenol	2500	U	2000	U			50	U	2100	U
132-64-9	Dibenzofuran	520	U	410	U			10	U	430	U
121-14-2	2,4-Dinitrotoluene	520	U	410	U			10	U	430	U
84-66-2	Diethyl phthalate	520	U	410	U			10	U	430	U
7005-72-3	4-Chlorophenyl phenyl ether	520	U	410	U			10	U	430	U
86-73-7	Fluorene	520	U	410	U			10	U	430	U
100-10-6	4-Nitroaniline	2500	U	2000	U			50	U	2100	U
534-52-1	4,6-Dinitro-2-Methylphenol	2500	U	2000	U			50	U	2100	U
86-30-6	N-Nitrosodiphenylamine	520	U	410	U			10	U	430	U
122-66-7	1,2-Diphenylhydrazine	520	U	410	U			10	U	430	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8		MPT-2-SD-9		MPT-2-SD-9DL		MPT-2-SW-9		MPT-13-SD-1	
LOCATION:		SOIL		SOIL		SOIL		WATER		SOIL	
SAMPLE MATRIX:		02/12/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20902		20740		20740		20740		20740	
LAB NUMBER:											
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/l		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether	520	U	410	U			10	U	430	U
118-74-1	Hexachlorobenzene	520	U	410	U			10	U	430	U
87-86-5	Pentachlorophenol	2500	U	2000	U			50	U	2100	U
85-01-8	Phenanthrene	520	U	100	J			10	U	430	U
120-12-7	Anthracene	520	U	410	U			10	U	430	U
84-74-2	Di-n-butyl phthalate	78	J	410	BU			2	BJ	48	BJ
206-44-0	Fluoranthene	520	U	150	J			10	U	53	J
129-00-0	Pyrene	520	U	100	J			10	U	51	J
85-68-7	Butyl benzyl phthalate	520	U	410	U			10	U	430	U
91-94-1	3,3'-Dichlorobenzidine	1000	U	810	U			20	U	870	U
56-55-3	Benzo[a]anthracene	520	U	410	U			10	U	430	U
218-01-9	Chrysene	520	U	65	J			10	U	59	J
117-81-7	Bis(2-ethylhexyl) phthalate	520	U	55	J			10	U	170	J
117-84-0	Di-n-octyl phthalate	520	U	410	U			10	U	430	U
205-99-2	Benzo[b]fluoranthene	520	U	410	U			10	U	430	U
207-08-9	Benzo[k]fluoranthene	520	U	410	U			10	U	430	U
50-32-8	Benzo[a]pyrene	520	U	410	U			10	U	430	U
193-39-5	Indeno(1,2,3-cd)pyrene	520	U	410	U			10	U	430	U
53-70-3	Dibenz[a,h]anthracene	520	U	410	U			10	U	430	U
191-24-2	Benzo[ghi]perylene	520	U	410	U			10	U	430	U
109-06-8	2-Picoline	2500	U	2000	U			50	U	2100	U
66-27-3	Methyl methanesulfonate	520	U	410	U			10	U	430	U
62-50-0	Ethyl methanesulfonate	520	U	410	U			10	U	430	U
98-86-2	Acetophenone	520	U	410	U			10	U	430	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8		MPT-2-SD-9		MPT-2-SD-9DL		MPT-2-SW-9		MPT-13-SD-1	
LOCATION:		SOIL		SOIL		SOIL		WATER		SOIL	
SAMPLE MATRIX:		02/12/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20902		20740		20740		20740		20740	
LAB NUMBER:											
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.
100-75-4	N-Nitrosopiperidine	520	U	410	U			10	U	430	U
122-09-8	Phenyl-tert-butylamine	2500	U	2000	U			50	U	2100	U
87-65-0	2,6-Dichlorophenol	520	U	410	U			10	U	430	U
924-16-3	N-Nitrosodi-n-butylamine	520	U	410	U			10	U	430	U
55-18-5	N-Nitrosodiethylamine	520	U	410	U			10	U	430	U
930-55-2	N-Nitrosopyrrolidine	520	U	410	U			10	U	430	U
92-87-5	Benzidine	2500	U	2000	U			50	U	2100	U
95-94-3	1,2,4,5-Tetrachlorobenzene	2500	U	2000	U			50	U	2100	U
608-93-5	Pentachlorobenzene	2500	U	2000	U			50	U	2100	U
134-32-7	1-Naphthylamine	2500	U	2000	U			50	U	2100	U
91-59-8	2-Naphthylamine	2500	U	2000	U			50	U	2100	U
58-90-2	2,3,4,6-Tetrachlorophenol	520	U	410	U			10	U	430	U
122-39-4	Diphenylamine	520	U	410	U			10	U	430	U
62-44-2	Phenacetin	520	U	410	U			10	U	430	U
92-67-1	4-Aminobiphenyl	2500	U	2000	U			50	U	2100	U
82-68-8	Pentachloronitrobenzene	2500	U	2000	U			50	U	2100	U
23950-58-5	Pronamide	520	U	410	U			10	U	430	U
60-11-7	p-(Dimethylamino)azobenzene	520	U	410	U			10	U	430	U
57-97-6	7,12-Dimethylbenz[a]anthracene	520	U	410	U			10	U	430	U
56-49-5	Methylcholanthrene	520	U	410	U			10	U	430	U
110-86-1	Pyridine	2500	U	2000	U			50	U	2100	U
10595-95-6	N-Nitrosomethylethylamine	520	U	410	U			10	U	430	U
59-89-2	N-Nitrosomorpholine	520	U	410	U			10	U	430	U
95-53-4	o-Toluidine	520	U	410	U			10	U	430	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8	MPT-2-SD-9	MPT-2-SD-9DL	MPT-2-SW-9	MPT-13-SD-1	
LOCATION:		SOIL	SOIL	SOIL	WATER	SOIL	
SAMPLE MATRIX:		02/12/92	01/23/92	01/23/92	01/23/92	01/23/92	
DATE SAMPLED:		20902	20740	20740	20740	20740	
LAB NUMBER:							
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
108-39-4	3-Methylphenol	520	U	410	U	10	U
1888-71-7	Hexachloropropene	2500	U	2000	U	50	U
106-50-3	p-Phenylenediamine	2500	U	2000	U	50	U
94-59-7	Safrrole	2500	U	2000	U	50	U
120-58-1	Isosafrole	2500	U	2000	U	50	U
130-15-4	1,4-Naphthoquinone	2500	U	2000	U	50	U
99-65-0	1,3-Dinitrobenzene	520	U	410	U	10	U
99-55-8	5-Nitro-o-toluidine	520	U	410	U	10	U
99-35-4	1,3,5-Trinitrobenzene	520	U	410	U	10	U
56-57-5	4-Nitroquinoline 1-oxide	520	U	410	U	10	U
91-80-5	Methapyrene	2500	U	2000	U	50	U
119-93-7	3,3'-Dimethylbenzidine	520	U	410	U	10	U
53-96-3	2-Acetylaminofluorene	520	U	410	U	10	U
70-30-4	Hexachlorophene	2500	U	2000	U	50	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL		MPT-13-SD-2		MPT-13-SD-3		MPT-13-SD-3DL	
LOCATION:		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740		20740		20740	
LAB NUMBER:									
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
62-75-9	N-Nitrosodimethylamine			420	U	430	U		
108-95-2	Phenol			420	U	430	U		
62-53-3	Aniline			420	U	430	U		
111-44-4	bis(2-Chloroethyl)Ether			420	U	430	U		
95-57-8	2-Chlorophenol			420	U	430	U		
541-73-1	1,3-Dichlorobenzene			420	U	430	U		
106-46-7	1,4-Dichlorobenzene			420	U	430	U		
100-51-6	Benzyl alcohol			420	U	430	U		
95-50-1	1,2-Dichlorobenzene			420	U	430	U		
95-48-7	2-Methylphenol			420	U	430	U		
39638-32-9	bis(2-chloroethyl)Ether			420	U	430	U		
106-44-5	4-Methylphenol			420	U	430	U		
621-64-7	N-Nitroso-Di-n-Propylamine			420	U	430	U		
67-72-1	Hexachloroethane			420	U	430	U		
98-95-3	Nitrobenzene			420	U	430	U		
78-59-1	Isophorone			420	U	430	U		
88-75-5	2-Nitrophenol			420	U	430	U		
105-67-9	2,4-Dimethylphenol			420	U	430	U		
65-75-0	Benzoic Acid			2100	U	2100	U		
111-91-1	Bis(2-chloroethoxy)methane			420	U	430	U		
120-83-2	2,4-Dichlorophenol			420	U	430	U		
120-82-1	1,2,4-Trichlorobenzene			420	U	430	U		
91-20-3	Naphthalene			420	U	430	U		
106-47-8	4-Chloroaniline			420	U	430	U		

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL	MPT-13-SD-2	MPT-13-SD-3	MPT-13-SD-3DL
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/23/92	01/23/92	01/23/92	01/23/92
DATE SAMPLED:		20740	20740	20740	20740
LAB NUMBER:					
UNITS:		µg/Kg	µg/Kg	µg/Kg	µg/Kg
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
87-68-3	Hexachlorobutadiene				
59-50-7	4-Chloro-3-Methylphenol				
91-57-6	2-Methylnaphthalene				
77-47-4	Hexachlorocyclopentadiene				
88-06-2	2,4,6-Trichlorophenol				
95-95-4	2,4,5-Trichlorophenol				
91-58-7	2-Chloronaphthalene				
88-74-4	2-Nitroaniline				
131-11-3	Dimethyl phthalate				
208-96-8	Acenaphthylene				
606-20-2	2,6-Dinitrotoluene				
99-09-2	3-Nitroaniline				
83-32-9	Acenaphthene				
51-28-5	2,4-Dinitrophenol				
100-02-7	4-Nitrophenol				
132-64-9	Dibenzofuran				
121-14-2	2,4-Dinitrotoluene				
84-66-2	Diethyl phthalate				
7005-72-3	4-Chlorophenyl phenyl ether				
86-73-7	Fluorene				
100-10-6	4-Nitroaniline				
534-52-1	4,6-Dinitro-2-Methylphenol				
86-30-6	N-Nitrosodiphenylamine				
122-66-7	1,2-Diphenylhydrazine				

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL		MPT-13-SD-2		MPT-13-SD-3		MPT-13-SD-3DL	
LOCATION:		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740		20740		20740	
LAB NUMBER:									
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether			420	U	430	U		
118-74-1	Hexachlorobenzene			420	U	430	U		
87-86-5	Pentachlorophenol			2100	U	2100	U		
85-01-8	Phenanthrene			420	U	430	U		
120-12-7	Anthracene			420	U	430	U		
84-74-2	Di-n-butyl phthalate			49	BJ	51	BJ		
206-44-0	Fluoranthene			420	U	430	U		
129-00-0	Pyrene			420	U	430	U		
85-68-7	Butyl benzyl phthalate			420	U	430	U		
91-94-1	3,3'-Dichlorobenzidine			850	U	860	U		
56-55-3	Benzo[a]anthracene			420	U	430	U		
218-01-9	Chrysene			420	U	430	U		
117-81-7	Bis(2-ethylhexyl) phthalate			420	U	45	J		
117-84-0	Di-n-octyl phthalate			420	U	430	U		
205-99-2	Benzo[b]fluoranthene			420	U	430	U		
207-08-9	Benzo[k]fluoranthene			420	U	430	U		
50-32-8	Benzo[a]pyrene			420	U	430	U		
193-39-5	Indeno(1,2,3-cd)pyrene			420	U	430	U		
53-70-3	Dibenz[a,h]anthracene			420	U	430	U		
191-24-2	Benzo[ghi]perylene			420	U	430	U		
109-06-8	2-Picoline			2100	U	2100	U		
66-27-3	Methyl methanesulfonate			420	U	430	U		
62-50-0	Ethyl methanesulfonate			420	U	430	U		
98-86-2	Acetophenone			420	U	430	U		

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL		MPT-13-SD-2		MPT-13-SD-3		MPT-13-SD-3DL	
LOCATION:		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740		20740		20740	
LAB NUMBER:									
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
100-75-4	N-Nitrosopiperidine			420	U	430	U		
122-09-8	Phenyl-tert-butylamine			2100	U	2100	U		
87-65-0	2,6-Dichlorophenol			420	U	430	U		
924-16-3	N-Nitrosodi-n-butylamine			420	U	430	U		
55-18-5	N-Nitrosodimethylamine			420	U	430	U		
930-55-2	N-Nitrosopyrrolidine			420	U	430	U		
92-87-5	Benzidine			2100	U	2100	U		
95-94-3	1,2,4,5-Tetrachlorobenzene			2100	U	2100	U		
608-93-5	Pentachlorobenzene			2100	U	2100	U		
134-32-7	1-Naphthylamine			2100	U	2100	U		
91-59-8	2-Naphthylamine			2100	U	2100	U		
58-90-2	2,3,4,6-Tetrachlorophenol			420	U	430	U		
122-39-4	Diphenylamine			420	U	430	U		
62-44-2	Phenacetin			420	U	430	U		
92-67-1	4-Aminobiphenyl			420	U	430	U		
82-68-8	Pentachloronitrobenzene			2100	U	2100	U		
23950-58-5	Pronamide			2100	U	2100	U		
60-11-7	p-(Dimethylamino)azobenzene			420	U	430	U		
57-97-6	7,12-Dimethylbenz[a]anthracene			420	U	430	U		
56-49-5	Methylcholanthrene			420	U	430	U		
110-86-1	Pyridine			2100	U	2100	U		
10595-95-6	N-Nitrosomethylethylamine			420	U	430	U		
59-89-2	N-Nitrosomorpholine			420	U	430	U		
95-53-4	o-Toluidine			420	U	430	U		

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL	MPT-13-SD-2	MPT-13-SD-3	MPT-13-SD-3DL
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/23/92	01/23/92	01/23/92	01/23/92
DATE SAMPLED:		20740	20740	20740	20740
LAB NUMBER:					
CAS RN	Common name	µg/Kg Conc.	µg/Kg Conc.	µg/Kg Conc.	µg/Kg Conc.
		Qual.	Qual.	Qual.	Qual.
108-39-4	3-Methylphenol		420 U	430 U	
1888-71-7	Hexachloropropene		2100 U	2100 U	
106-50-3	p-Phenylenediamine		2100 U	2100 U	
94-59-7	Safrole		2100 U	2100 U	
120-58-1	Isosafrole		2100 U	2100 U	
130-15-4	1,4-Naphthoquinone		2100 U	2100 U	
99-65-0	1,3-Dinitrobenzene		420 U	430 U	
99-55-8	5-Nitro-o-toluidine		420 U	430 U	
99-35-4	1,3,5-Trinitrobenzene		420 U	430 U	
56-57-5	4-Nitroquinoline 1-oxide		420 U	430 U	
91-80-5	Methapyrilene		2100 U	2100 U	
119-93-7	3,3'-Dimethylbenzidine		420 U	430 U	
53-96-3	2-Acetylaminofluorene		420 U	430 U	
70-30-4	Hexachlorophene		2100 U	2100 U	

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDATA4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS:		µg/l	Qual.
CAS RN	Common name	Conc.	
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
62-53-3	Aniline	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-75-0	Benzoic Acid	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS:			
CAS RN	Common name	µg/l Conc.	Qual.
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethyl phthalate	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDATA4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS:		µg/l	
CAS RN	Common name	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butyl phthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butyl benzyl phthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo[a]anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	10	U
117-84-0	Di-n-octyl phthalate	10	U
205-99-2	Benzo[b]fluoranthene	10	U
207-08-9	Benzo[k]fluoranthene	10	U
50-32-8	Benzo[a]pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz[a,h]anthracene	10	U
191-24-2	Benzo[ghi]perylene	10	U
109-06-8	2-Picoline	50	U
66-27-3	Methyl methanesulfonate	10	U
62-50-0	Ethyl methanesulfonate	10	U
98-86-2	Acetophenone	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDAT4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS:		µg/l	
CAS RN	Common name	Conc.	Qual.
100-75-4	N-Nitrosopiperidine	10	U
122-09-8	Phenyl-tert-butylamine	50	U
87-65-0	2,6-Dichlorophenol	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U
55-18-5	N-Nitrosodiethylamine	10	U
930-55-2	N-Nitrosopyrrolidine	10	U
92-87-5	Benzidine	50	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U
608-93-5	Pentachlorobenzene	50	U
134-32-7	1-Naphthylamine	50	U
91-59-8	2-Naphthylamine	50	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U
122-39-4	Diphenylamine	10	U
62-44-2	Phenacetin	10	U
92-67-1	4-Aminobiphenyl	50	U
82-68-8	Pentachloronitrobenzene	50	U
23950-58-5	Pronamide	10	U
60-11-7	p-(Dimethylamino)azobenzene	10	U
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U
56-49-5	Methylcholanthrene	10	U
110-86-1	Pyridine	50	U
10595-95-6	N-Nitrosomethylethylamine	10	U
59-89-2	N-Nitrosomorpholine	10	U
95-53-4	o-Toluidine	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SEDIMENTS AND SURFACE WATER

A:\MPTDATA4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS:		µg/l	
CAS RN	Common name	Conc.	Qual.
108-39-4	3-Methylphenol	10	U
1888-71-7	Hexachloropropene	50	U
106-50-3	p-Phenylenediamine	50	U
94-59-7	Safrole	50	U
120-58-1	Isosafrole	50	U
130-15-4	1,4-Naphthoquinone	50	U
99-65-0	1,3-Dinitrobenzene	10	U
99-55-8	5-Nitro-o-toluidine	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U
56-57-5	4-Nitroquinoline 1-oxide	10	U
91-80-5	Methapyrilene	50	U
119-93-7	3,3'-Dimethylbenzidine	10	U
53-96-3	2-Acetylaminofluorene	10	U
70-30-4	Hexachlorophene	50	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS & SURFACE WATER

CAS RN	Common name	MPT-B-SD-1 SOIL		MPTBDDUP1 SOIL		MPTBDDUP1DL SOIL		MPT-B-SW-1 WATER		MPTBWDUP1 WATER	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/l		µg/l	
319-84-6	alpha-BHC	0.5	U	0.8	U	3.9	U	0.01	U	0.01	U
319-85-7	beta-BHC	1.1	U	1.6	U	7.8	U	0.02	U	0.02	U
319-86-8	delta-BHC	0.5	U	0.8	U	3.9	U	0.01	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.5	U	0.8	U	3.9	U	0.01	U	0.01	U
76-44-8	Heptachlor	0.5	U	0.8	U	3.9	U	0.01	U	0.01	U
309-00-2	Aldrin	0.5	U	0.8	U	3.9	U	0.01	U	0.01	U
1024-57-3	Heptachlor epoxide	0.5	U	0.8	U	3.9	U	0.01	U	0.01	U
959-98-8	Endosulfan I	1.1	U	1.6	U	7.8	U	0.02	U	0.02	U
60-57-1	Dieldrin	1.1	U	1.6	U	7.8	U	0.02	U	0.02	U
72-55-9	4,4'-DDE	3	U	1.6	U	7.8	U	0.02	U	0.02	U
72-20-8	Endrin	1.1	U	1.6	U	7.8	U	0.02	U	0.02	U
33213-65-9	Endosulfan II	1.1	U	1.6	U	7.8	U	0.02	U	0.02	U
72-54-8	4,4'-DDD	1.1	U	1.6	U	7.8	U	0.02	U	0.02	U
7421-93-4	Endrin aldehyde	NR		NR		NR		NR		NR	
1031-07-8	Endosulfan sulfate	1.1	U	1.6	U	7.8	U	0.02	U	0.02	U
50-29-3	4,4'-DOT	0.8	JX	1.6	U	7.8	U	0.02	U	0.02	U
72-43-5	Methoxychlor	2.1	U	3.1	U	16	U	0.04	U	0.04	U
53494-70-5	Endrin Ketone	1.1	U	1.6	U	7.8	U	0.02	U	0.02	U
57-74-09	Chlordane	5	U	8	U	39	U	0.1	U	0.1	U
8001-35-2	Toxaphene	27	U	39	U	200	U	0.5	U	0.5	U
12674-11-2	Aroclor-1016	43	U	63	U	310	U	0.8	U	0.8	U
11104-28-2	Aroclor-1221	110	U	160	U	780	U	2	U	2	U
11141-16-5	Aroclor-1232	110	U	160	U	780	U	2	U	2	U
53469-21-9	Aroclor-1242	43	U	63	U	310	U	0.8	U	0.8	U

* Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS & SURFACE WATER

A:IMPTDAT1.WK1		MPT-B-SD-1		MPTBSDDUP1		MPT-B-SW-1		MPTBSWDUP1	
LOCATION:		SOIL		SOIL		WATER		WATER	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/21/92	
DATE SAMPLED:		20723		20723		20723		20723	
LAB NUMBER:		20723		20723		20723		20723	
UNITS:		µg/Kg		µg/Kg		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
12672-29-6	Aroclor-1248	21	U	31	U	160	U	0.4	U
11097-69-1	Aroclor-1254	11	U	16	U	78	U	0.2	U
11096-82-5	Aroclor-1260	11	U	16	U	78	U	0.2	U
510-15-6	Chlorobenzilate	27	U	39	U	20	U	0.5	U
2303-16-4	Diallate	53	U	78	U	390	U	1	U
465-73-6	Isodrin	1.1	U	1.6	U	7.8	U	0.02	U
143-50-0	Kepona	NR		NR		NR		NR	

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SW-2		MPT-B-SW-3		MPT-B-SW-3		MPT-2-SD-4	
LOCATION:		WATER		WATER		WATER		SOIL	
SAMPLE MATRIX:		01/21/92		01/21/92		01/21/92		01/22/92	
DATE SAMPLED:		20723		20723		20723		20722	
LAB NUMBER:		20723		20723		20723		20722	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
319-84-6	alpha-BHC	0.5	U	0.01	U	3.7	U	0.01	U
319-85-7	beta-BHC	1	U	0.02	U	7.4	U	0.02	U
319-86-8	delta-BHC	0.5	U	0.01	U	3.7	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.5	U	0.01	U	3.7	U	0.01	U
76-44-8	Heptachlor	0.5	U	0.01	U	3.7	U	0.01	U
309-00-2	Aldrin	0.5	U	0.01	U	3.7	U	0.01	U
1024-57-3	Heptachlor epoxide	0.5	U	0.01	U	3.7	U	0.01	U
959-98-8	Endosulfan I	1	U	0.02	U	7.4	U	0.02	U
60-57-1	Dieldrin	1	U	0.02	U	7.4	U	0.02	U
72-55-9	4,4'-DDE	1	U	0.02	U	7.4	U	0.02	U
72-20-8	Endrin	1	U	0.02	U	7.4	U	0.02	U
33213-65-9	Endosulfan II	1	U	0.02	U	7.4	U	0.02	U
72-54-8	4,4'-DDD	1	U	0.02	U	7.4	U	0.02	U
7421-93-4	Endrin aldehyde	NR		NR		NR		NR	
1031-07-8	Endosulfan sulfate	1	U	0.02	U	7.4	U	0.02	U
50-29-3	4,4'-DDT	1	U	0.02	U	7.4	U	0.02	U
72-43-5	Methoxychlor	2.1	U	0.04	U	15	U	0.04	U
53494-70-5	Endrin Ketone	1	U	0.02	U	7.4	U	0.02	U
57-74-09	Chlordane	5	U	0.1	U	37	U	0.1	U
8001-35-2	Toxaphene	26	U	0.5	U	180	U	0.5	U
12674-11-2	Aroclor-1016	42	U	0.8	U	300	U	0.8	U
11104-28-2	Aroclor-1221	100	U	2	U	740	U	2	U
11141-16-5	Aroclor-1232	100	U	2	U	740	U	2	U
53469-21-9	Aroclor-1242	42	U	0.8	U	300	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-2	MPT-B-SW-2	MPT-B-SD-3	MPT-B-SW-3	MPT-2-SD-4
LOCATION:		SOIL	WATER	SOIL	WATER	SOIL
SAMPLE MATRIX:		01/21/92	01/21/92	01/21/92	01/21/92	01/22/92
DATE SAMPLED:		20723	20723	20723	20723	20722
LAB NUMBER:		20723	20723	20723	20723	20722
CAS RN	Common name	µg/Kg	µg/l	µg/Kg	µg/l	µg/Kg
		Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
12672-29-6	Aroclor-1248	21	0.4	150	0.4	27
11097-69-1	Aroclor-1254	10	0.2	74	0.2	13
11096-82-5	Aroclor-1260	10	0.2	74	0.2	13
510-15-6	Chlorobenzilate	26	0.5	180	0.5	33
2303-16-4	Diallate	53	1	370	1	67
465-73-6	Isodrin	1	0.02	7.4	0.02	1.3
143-50-0	Kepone	NR	NR	NR	NR	NR

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		DATE SAMPLED:		DATE SAMPLED:	
LAB NUMBER:		20722		20722	
UNITS:		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
319-84-6	alpha-BHC	3.3	U	0.01	U
319-85-7	beta-BHC	6.7	U	0.02	U
319-86-8	delta-BHC	3.3	U	0.01	U
58-89-9	gamma-BHC; Lindane	3.3	U	0.01	U
76-44-8	Heptachlor	3.3	U	0.01	U
309-00-2	Aldrin	3.3	U	0.01	U
1024-57-3	Heptachlor epoxide	3.3	U	0.01	U
959-98-8	Endosulfan I	6.7	U	0.02	U
60-57-1	Dieldrin	6.7	U	0.02	U
72-55-9	4,4'-DDE	6.7	U	0.02	U
72-20-8	Endrin	6.7	U	0.02	U
33213-65-9	Endosulfan II	6.7	U	0.02	U
72-54-8	4,4'-DDD	6.7	U	0.02	U
7421-93-4	Endrin aldehyde	NR		NR	
1031-07-8	Endosulfan sulfate	6.7	U	0.02	U
50-29-3	4,4'-DDT	6.7	U	0.02	U
72-43-5	Methoxychlor	13	U	0.04	U
53494-70-5	Endrin Ketone	6.7	U	0.02	U
57-74-09	Chlordane	33	U	0.1	U
8001-35-2	Toxaphene	170	U	0.5	U
12674-11-2	Aroclor-1016	270	U	0.8	U
11104-28-2	Aroclor-1221	670	U	2	U
11141-16-5	Aroclor-1232	670	U	2	U
53469-21-9	Aroclor-1242	270	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722	
LAB NUMBER:					
UNITS:		µg/Kg		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
12672-29-6	Aroclor-1248	130	U	0.4	U
11097-69-1	Aroclor-1254	67	U	0.2	U
11096-82-5	Aroclor-1260	67	U	0.2	U
510-15-6	Chlorobenzilate	170	U	0.5	U
2303-16-4	Diallate	330	U	1	U
465-73-6	Isodrin	6.7	U	0.02	U
143-50-0	Kepona	NR		NR	

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SD-5		MPT-2-SD-5DL		MPT-2-SW-5		MPT-2-SD-6		MPT-2-SD-6DL	
LOCATION:		SOIL		SOIL		WATER		SOIL		SOIL	
SAMPLE MATRIX:		01/22/92		01/22/92		01/22/92		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722		20722		20722		20722	
LAB NUMBER:		20722		20722		20722		20722		20722	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
12672-29-6	Aroclor-1248	67	U	170	U	0.4	U	46	U	230	U
11097-69-1	Aroclor-1254	33	U	83	U	0.2	U	23	U	110	U
11096-82-5	Aroclor-1260	33	U	83	U	0.2	U	23	U	110	U
510-15-6	Chlorobenzilate	83	U	210	U	0.5	U	57	U	280	U
2303-16-4	Diallate	170	U	420	U	1	U	110	U	570	U
465-73-6	Isodrin	3.3	U	8.3	U	0.02	U	2.3	U	11	U
143-50-0	Kepona		NR		NR		NR		NR		NR

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

CAS RN	Common name	MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
UNITS:		µg/l	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
319-84-6	alpha-BHC	0.01	U	0.6	U	0.6	U	3.2	U	3.2	U
319-85-7	beta-BHC	0.02	U	1.3	U	1.2	U	6.3	U	6.3	U
319-86-8	delta-BHC	0.01	U	0.6	U	0.6	U	3.2	U	3.2	U
58-89-9	gamma-BHC; Lindane	0.01	U	0.6	U	0.6	U	3.2	U	3.2	U
76-44-8	Heptachlor	0.01	U	0.6	U	0.6	U	3.2	U	3.2	U
309-00-2	Aldrin	0.01	U	0.6	U	0.6	U	3.2	U	3.2	U
1024-57-3	Heptachlor epoxide	0.01	U	0.6	U	0.6	U	3.2	U	3.2	U
959-98-8	Endosulfan I	0.02	U	1.3	U	1.2	U	6.3	U	6.3	U
60-57-1	Dieldrin	0.02	U	1.3	U	1.2	U	6.3	U	6.3	U
72-55-9	4,4'-DDE	0.02	U	3.4	U	3.6	U	3.5	JX	4.1	JX
72-20-8	Endrin	0.02	U	1.3	U	1.2	U	6.3	U	6.3	U
33213-65-9	Endosulfan II	0.02	U	1.3	U	1.2	U	6.3	U	6.3	U
72-54-8	4,4'-DDD	0.02	U	1.3	JX	1.5	U	6.3	U	6.3	U
7421-93-4	Endrin aldehyde		NR		NR		NR		NR		NR
1031-07-8	Endosulfan sulfate	0.02	U	1.3	U	1.2	U	6.3	U	6.3	U
50-29-3	4,4'-DDT	0.02	U	1.3	U	1.2	U	6.3	U	6.3	U
72-43-5	Methoxychlor	0.04	U	2.5	U	2.4	U	13	U	12	U
53494-70-5	Endrin Ketone	0.02	U	1.3	U	1.2	U	6.3	U	6.3	U
57-74-09	Chlordane	0.1	U	6.3	U	6	U	32	U	30	U
8001-35-2	Toxaphene	0.5	U	32	U	30	U	160	U	150	U
12674-11-2	Aroclor-1016	0.8	U	51	U	48	U	250	U	240	U
11104-28-2	Aroclor-1221	2	U	130	U	120	U	630	U	600	U
11141-16-5	Aroclor-1232	2	U	130	U	120	U	630	U	600	U
53469-21-9	Aroclor-1242	0.8	U	51	U	48	U	250	U	240	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6	MPT-2-SD-7	MPT-2-SD-7A	MPT-2-SD-7DL	MPT-2-SD-7ADL	
LOCATION:		WATER	SOIL	SOIL	SOIL	SOIL	
SAMPLE MATRIX:		01/22/92	01/23/92	01/23/92	01/23/92	01/23/92	
DATE SAMPLED:		20722	20740	20740	20740	20740	
LAB NUMBER:							
CAS RN	Common name	µg/l	µg/Kg	µg/Kg	µg/Kg	µg/Kg	
		Conc.	Qual.	Conc.	Qual.	Conc.	
						Qual.	
12672-29-6	Aroclor-1248	0.4	U	25	U	130	U
11097-69-1	Aroclor-1254	0.2	U	13	U	63	U
11096-82-5	Aroclor-1260	0.2	U	13	U	63	U
510-15-6	Chlorobenzilate	0.5	U	32	U	160	U
2303-16-4	Diallate	1	U	63	U	320	U
465-73-6	Isodrin	0.02	U	1.3	U	6.3	U
143-50-0	Kepona		NR		NR		NR

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
UNITS:		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
319-84-6	alpha-BHC	0.01	U	0.01	U
319-85-7	beta-BHC	0.02	U	0.02	U
319-86-8	delta-BHC	0.01	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U	0.01	U
76-44-8	Heptachlor	0.01	U	0.01	U
309-00-2	Aldrin	0.01	U	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U	0.01	U
959-98-8	Endosulfan I	0.02	U	0.02	U
60-57-1	Dieldrin	0.02	U	0.02	U
72-55-9	4,4'-DDE	0.02	U	0.02	U
72-20-8	Endrin	0.02	U	0.02	U
33213-65-9	Endosulfan II	0.02	U	0.02	U
72-54-8	4,4'-DDD	0.02	U	0.02	U
7421-93-4	Endrin aldehyde		NR		NR
1031-07-8	Endosulfan sulfate	0.02	U	0.02	U
50-29-3	4,4'-DDT	0.02	U	0.02	U
72-43-5	Methoxychlor	0.04	U	0.04	U
53494-70-5	Endrin Ketone	0.02	U	0.02	U
57-74-09	Chlordane	0.1	U	0.1	U
8001-35-2	Toxaphene	0.5	U	0.5	U
12674-11-2	Aroclor-1016	0.8	U	0.8	U
11104-28-2	Aroclor-1221	2	U	2	U
11141-16-5	Aroclor-1232	2	U	2	U
53469-21-9	Aroclor-1242	0.8	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
UNITS:					
CAS RN	Common name	µg/l	µg/l	Qual.	Qual.
12672-29-6	Aroclor-1248	0.4	0.4	U	U
11097-69-1	Aroclor-1254	0.2	0.2	U	U
11096-82-5	Aroclor-1260	0.2	0.2	U	U
510-15-6	Chlorobenzilate	0.5	0.5	U	U
2303-16-4	Diallate	1	1	U	U
465-73-6	Isodrin	0.02	0.02	U	U
143-50-0	Kepon			NR	NR

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8		MPT-2-SD-9		MPT-2-SD-9DL		MPT-2-SW-9		MPT-13-SD-1	
LOCATION:		SOIL		SOIL		SOIL		WATER		SOIL	
SAMPLE MATRIX:		02/12/92		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20902		20740		20740		20740		20740	
LAB NUMBER:											
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/l Conc.	Qual.	µg/Kg Conc.	Qual.
319-84-6	alpha-BHC	0.6	U	0.5	U	2.5	U	0.01	U	0.5	U
319-85-7	beta-BHC	1.2	U	1	U	4.9	U	0.02	U	1.1	U
319-86-8	delta-BHC	0.6	U	0.5	U	2.5	U	0.01	U	0.5	U
58-89-9	gamma-BHC; Lindane	0.6	U	0.5	U	2.5	U	0.01	U	0.5	U
76-44-8	Heptachlor	0.6	U	0.5	U	2.5	U	0.01	U	0.5	U
309-00-2	Aldrin	0.6	U	0.5	U	2.5	U	0.01	U	0.5	U
1024-57-3	Heptachlor epoxide	0.6	U	0.5	U	2.5	U	0.01	U	0.5	U
959-98-8	Endosulfan I	1.2	U	1	U	4.9	U	0.02	U	1.1	U
60-57-1	Dieldrin	1.2	U	1	U	4.9	U	0.02	U	1.1	U
72-55-9	4,4'-DDE	1.2	U	1.5	U	4.9	U	0.02	U	1.2	U
72-20-8	Endrin	1.2	U	1	U	4.9	U	0.02	U	1.1	U
33213-65-9	Endosulfan II	1.2	U	1	U	4.9	U	0.02	U	1.1	U
72-54-8	4,4'-DDD	1.2	U	1.7	JX	2.6	JX	0.02	U	1.1	U
7421-93-4	Endrin aldehyde	1.2	U	1	U	4.9	U	0.02	U	1.1	U
1031-07-8	Endosulfan sulfate	1.2	U	1	U	4.9	U	0.02	U	1.1	U
50-29-3	4,4'-DDT	1.2	U	1	U	4.9	U	0.02	U	1.1	U
72-43-5	Methoxychlor	2.5	U	4	U	9.8	U	0.04	U	2.2	U
53494-70-5	Endrin Ketone	1.2	U	1	U	4.9	U	0.02	U	1.1	U
57-74-09	Chlordane	6	U	4.9	U	25	U	0.1	U	9.4	U
8001-35-2	Toxaphene	31	U	25	U	120	U	0.5	U	26	U
12674-11-2	Aroclor-1016	50	U	40	U	200	U	0.8	U	42	U
11104-28-2	Aroclor-1221	120	U	99	U	490	U	2	U	110	U
11141-16-5	Aroclor-1232	120	U	99	U	490	U	2	U	110	U
53469-21-9	Aroclor-1242	50	U	40	U	200	U	0.8	U	42	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:IMPTDAT3.WK1		MPT-2-SD-8	MPT-2-SD-9	MPT-2-SD-9DL	MPT-2-SW-9	MPT-13-SD-1
LOCATION:		SOIL	SOIL	SOIL	WATER	SOIL
SAMPLE MATRIX:		02/12/92	01/23/92	01/23/92	01/23/92	01/23/92
DATE SAMPLED:		20902	20740	20740	20740	20740
LAB NUMBER:						
CAS RN	UNITS:	µg/Kg	µg/Kg	µg/Kg	µg/l	µg/Kg
	Common name	Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
12672-29-6	Aroclor-1248	25 U	20 U	99 U	0.4 U	21 U
11097-69-1	Aroclor-1254	12 U	9.9 U	49 U	0.2 U	11 U
11096-82-5	Aroclor-1260	12 U	9.9 U	49 U	0.2 U	11 U
510-15-6	Chlorobenzilate	31 U	25 U	123 U	0.5 U	26 U
2303-16-4	Diallate	62 U	49 U	250 U	1 U	53 U
465-73-6	Isodrin	1.2 U	1 U	4.9 U	0.02 U	1.1 U
143-50-0	Kepona	NR	NR	NR	NR	NR

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL	MPT-13-SD-2	MPT-13-SD-3	MPT-13-SD-3DL		
LOCATION:		SOIL	SOIL	SOIL	SOIL		
SAMPLE MATRIX:		01/23/92	01/23/92	01/23/92	01/23/92		
DATE SAMPLED:		20740	20740	20740	20740		
LAB NUMBER:		20740	20740	20740	20740		
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
319-84-6	alpha-BHC	2.6	U	0.5	U	0.5	U
319-85-7	beta-BHC	5.3	U	1.3	U	1.1	U
319-86-8	delta-BHC	2.6	U	0.5	U	0.5	U
58-89-9	gamma-BHC; Lindane	2.6	U	0.5	U	0.5	U
76-44-8	Heptachlor	2.6	U	0.5	U	0.5	U
309-00-2	Aldrin	2.6	U	0.5	U	0.5	U
1024-57-3	Heptachlor epoxide	2.6	U	0.5	U	0.5	U
959-98-8	Endosulfan I	5.3	U	1.3	U	1.1	U
60-57-1	Dieldrin	5.3	U	1.3	U	1.1	U
72-55-9	4,4'-DDE	5.3	U	1.3	U	2.4	JX
72-20-8	Endrin	5.3	U	1.3	U	1.1	U
33213-65-9	Endosulfan II	5.3	U	1.3	U	1.1	U
72-54-8	4,4'-DDD	5.3	U	1.3	U	2.8	JX
7421-93-4	Endrin aldehyde	5.3	U	1.3	U	1.1	U
1031-07-8	Endosulfan sulfate	5.3	U	1.3	U	1.1	U
50-29-3	4,4'-DDT	5.3	U	1.3	U	1.1	U
72-43-5	Methoxychlor	11	U	2.6	U	2.1	U
53494-70-5	Endrin Ketone	5.3	U	1.3	U	1.1	U
57-74-09	Chlordane	26	U	5.1	U	11	U
8001-35-2	Toxaphene	130	U	26	U	226	U
12674-11-2	Aroclor-1016	210	U	41	U	42	U
11104-28-2	Aroclor-1221	530	U	100	U	110	U
11141-16-5	Aroclor-1232	530	U	100	U	110	U
53469-21-9	Aroclor-1242	210	U	41	U	42	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1

LOCATION:

SAMPLE MATRIX:

DATE SAMPLED:

LAB NUMBER:

MPT-13-SD-1DL MPT-13-SD-2 MPT-13-SD-3 MPT-13-SD-3DL
 SOIL SOIL SOIL SOIL
 01/23/92 01/23/92 01/23/92 01/23/92
 20740 20740 20740 20740

UNITS:

Common name

CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
12672-29-6	Aroclor-1248	110	U	21	U	21	U	110	U
11097-69-1	Aroclor-1254	53	U	10	U	11	U	53	U
11096-82-5	Aroclor-1260	53	U	10	U	11	U	53	U
510-15-6	Chlorobenzilate	130	U	26	U	26	U	130	U
2303-16-4	Diallate	260	U	51	U	53	U	260	U
465-73-6	Isodrin	5.3	U	1	U	1.1	U	5.3	U
143-50-0	Kepone	NR		NR		NR		NR	

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
CAS RN	Common name	µg/l Conc.	Qual.
319-84-6	alpha-BHC	0.01	U
319-85-7	beta-BHC	0.02	U
319-86-8	delta-BHC	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U
76-44-8	Heptachlor	0.01	U
309-00-2	Aldrin	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U
959-98-8	Endosulfan I	0.02	U
60-57-1	Dieldrin	0.02	U
72-55-9	4,4'-DDE	0.02	U
72-20-8	Endrin	0.02	U
33213-65-9	Endosulfan II	0.02	U
72-54-8	4,4'-DDD	0.02	U
7421-93-4	Endrin aldehyde	0.02	U
1031-07-8	Endosulfan sulfate	0.02	U
50-29-3	4,4'-DDT	0.02	U
72-43-5	Methoxychlor	0.04	U
53494-70-5	Endrin Ketone	0.02	U
57-74-09	Chlordane	0.1	U
8001-35-2	Toxaphene	0.5	U
12674-11-2	Aroclor-1016	0.8	U
11104-28-2	Aroclor-1221	2	U
11141-16-5	Aroclor-1232	2	U
53469-21-9	Aroclor-1242	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SEDIMENTS AND SURFACE WATER

A:\MPTDAT4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
UNITS: $\mu\text{g/l}$			
CAS RN	Common name	Conc.	Qual.
12672-29-6	Aroclor-1248	0.4	U
11097-69-1	Aroclor-1254	0.2	U
11096-82-5	Aroclor-1260	0.2	U
510-15-6	Chlorobenzilate	0.5	U
2303-16-4	Diallate	1	U
465-73-6	Isodrin	0.02	U
143-50-0	Kepona	NR	

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-1	MPTBSDDUP1	MPTBSDDUP1DL	MPT-B-SW-1	MPTBSWDUP1	
LOCATION:		SOIL	SOIL	SOIL	WATER	WATER	
SAMPLE MATRIX:		01/21/92	01/21/92		01/21/92	01/21/92	
DATE SAMPLED:		20723	20723		20723	20723	
LAB NUMBER:		20723	20723		20723	20723	
CAS RN	Common name	mg/Kg Conc.	Qual.	mg/Kg Conc.	Qual.	mg/Kg Conc.	Qual.
7440-36-0	Antimony	11.4	U	16.4	U	40	U
7440-38-2	Arsenic	0.68	B	6.6	B	1.2	B
7440-39-3	Barium	3.6	B	15.2	B	11.1	B
7440-41-7	Beryllium	0.059	B	0.54	B	0.1	U
7440-43-9	Cadmium	0.46	U	0.66	U	1.6	U
7440-47-3	Chromium	2.5	B	26.6	B	1.9	U
7440-48-4	Cobalt	2.1	B	4.9	B	5.1	U
7440-50-8	Copper	2	B	3.5	B	1.4	U
7440-92-1	Lead	3.4	U	10	U	1.3	B
7440-97-6	Mercury	0.078	U	0.13	U	0.16	U
7440-02-0	Nickel	2	U	6.4	B	7	U
7440-49-2	Selenium	0.39	B	0.62	B	2.6	B
7440-22-4	Silver	0.66	U	0.95	U	2.3	U
7440-28-0	Thallium	0.4	U	0.58	U	1.4	U
7440-31-5	Tin	59.1	U	85.4	U	208	U
7440-62-2	Vanadium	2.2	B	26.2	B	3.6	B
7440-66-6	Zinc	7.7	U	32.1	U	6.1	B
	Cyanide		NR		NR	3	B

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-B-SD-2	MPT-B-SW-2	MPT-B-SD-3	MPT-B-SW-3	MPT-2-SD-4
LOCATION:		SOIL	WATER	SOIL	WATER	SOIL
SAMPLE MATRIX:		01/21/92	01/21/92	01/21/92	01/21/92	01/22/92
DATE SAMPLED:		20723	20723	20723	20723	20722
LAB NUMBER:		20723	20723	20723	20723	20722
CAS RN	Common name	mg/Kg	µg/l	mg/Kg	µg/l	mg/Kg
		Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
7440-36-0	Antimony	11	40	18.2	57.5	18.8
7440-38-2	Arsenic	0.21	0.86	4.2	1.2	5.1
7440-39-3	Barium	7.4	12.3	16.1	15.4	15.9
7440-41-7	Beryllium	0.045	0.1	0.59	0.1	0.35
7440-43-9	Cadmium	0.44	1.6	0.82	1.6	0.55
7440-47-3	Chromium	4.4	1.9	28.1	1.9	24
7440-48-4	Cobalt	1.5	5.6	6.4	9.7	5
7440-50-8	Copper	2.3	37.2	3.1	2.4	14.2
7440-92-1	Lead	3	0.78	8.5	0.91	29.1
7440-97-6	Mercury	0.068	0.16	0.15	0.16	0.39
7440-02-0	Nickel	5.5	19.8	7.1	7	7.5
7440-49-2	Selenium	0.32	1.1	0.52	1.8	0.43
7440-22-4	Silver	0.64	2.3	1.1	2.3	0.79
7440-28-0	Thallium	0.39	1.4	0.64	1.4	0.48
7440-31-5	Tin	57.3	208	94.8	208	71.2
7440-62-2	Vanadium	3.7	2.7	28.4	2.7	24.4
7440-66-6	Zinc	6.1	23.5	26.7	10.7	59.7
	Cyanide	NR	1.8	NR	1.8	NR

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SEDIMENTS & SURFACE WATER

A:\MPTDAT1.WK1		MPT-2-SD-4DL		MPT-2-SW-4	
LOCATION:		SOIL		WATER	
SAMPLE MATRIX:		DATE SAMPLED:		DATE SAMPLED:	
DATE SAMPLED:		20722		01/22/92	
LAB NUMBER:		20722		20722	
CAS RN	Common name	mg/Kg Conc.	Qual.	µg/l Conc.	Qual.
7440-36-0	Antimony			43.1	B
7440-38-2	Arsenic			1	B
7440-39-3	Barium			12.4	B
7440-41-7	Beryllium			0.1	U
7440-43-9	Cadmium			1.6	U
7440-47-3	Chromium			1.9	U
7440-48-4	Cobalt			8.1	B
7440-50-8	Copper			24.5	B
7440-92-1	Lead			1.1	B
7440-97-6	Mercury			0.16	U
7440-02-0	Nickel			16.2	B
7440-49-2	Selenium			1.1	U
7440-22-4	Silver			2.3	U
7440-28-0	Thallium			1.4	U
7440-31-5	Tin			208	U
7440-62-2	Vanadium			2.7	U
7440-66-6	Zinc			13.4	B
	Cyanide			3.9	B

*Blank entries indicate that sample was not analyzed for that analyte group

METALS AND CYANIDE: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SD-5		MPT-2-SD-5DL		MPT-2-SW-5		MPT-2-SD-6		MPT-2-SD-6DL	
LOCATION:		SOIL		SOIL		WATER		SOIL		SOIL	
SAMPLE MATRIX:		01/22/92		01/22/92		01/22/92		01/22/92		01/22/92	
DATE SAMPLED:		20722		20722		20722		20722		20722	
LAB NUMBER:		20722		20722		20722		20722		20722	
UNITS:		mg/Kg		mg/Kg		µg/l		mg/Kg		mg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
7440-36-0	Antimony	15.8	U			66.7		23.1	U		
7440-38-2	Arsenic	8.9				1.7	B	10.8			
7440-39-3	Barium	25.8	B			10.9	B	33.7	B		
7440-41-7	Beryllium	0.5	B			0.96	B	0.96	B		
7440-43-9	Cadmium	0.64	U			1.6	U	0.93	U		
7440-47-3	Chromium	30.9				2	B	50.1			
7440-48-4	Cobalt	6.2	B			6.8	B	11.3	B		
7440-50-8	Copper	15.6				1.4	U	15.7			
7440-92-1	Lead	27.9				2.2	B	27.9			
7440-97-6	Mercury	0.11	B			0.16	U	0.18	U		
7440-02-0	Nickel	13.3	B			7	U	12.2	B		
7440-49-2	Selenium	0.5	B			5.1		0.76	B		
7440-22-4	Silver	0.91	U			2.3	U	1.3	U		
7440-28-0	Thallium	0.56	U			1.4	U	0.81	U		
7440-31-5	Tin	82.2	U			208	U	120	U		
7440-62-2	Vanadium	32.9				2.7	U	56.5			
7440-66-6	Zinc	80.6				3.7	U	96.5			
	Cyanide		NR			5	B		NR		

*Blank entries indicate that sample was not analyzed for that analyte group

METALS AND CYANIDE: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-6		MPT-2-SD-7		MPT-2-SD-7A		MPT-2-SD-7DL		MPT-2-SD-7ADL			
LOCATION:		WATER		SOIL		SOIL		SOIL		SOIL			
SAMPLE MATRIX:		01/22/92		01/23/92		01/23/92		01/23/92		01/23/92			
DATE SAMPLED:		20722		20740		20740		20740		20740			
LAB NUMBER:		20722		20740		20740		20740		20740			
CAS RN	Common name	µg/l	Conc.	Qual.	mg/Kg	Conc.	Qual.	mg/Kg	Conc.	Qual.	mg/Kg	Conc.	Qual.
7440-36-0	Antimony		40	U		15.5	U		15.4	B			
7440-38-2	Arsenic		1.5	B		1.1	B		0.98	B			
7440-39-3	Barium		9.7	B		8.1	B		6.8	B			
7440-41-7	Beryllium		0.1	U		0.041	U		0.032	U			
7440-43-9	Cadmium		1.6	U		0.63	U		0.49	U			
7440-47-3	Chromium		2	B		3.3	B		2.9	B			
7440-48-4	Cobalt		5.1	U		2.4	B		1.6	U			
7440-50-8	Copper		1.4	U		4	B		4.6	B			
7440-92-1	Lead		1.6	B		4.9	B		3.8	B			
7440-97-6	Mercury		0.16	U		0.1	U		0.044	U			
7440-02-0	Nickel		7	U		2.7	U		2.4	B			
7440-49-2	Selenium		1.4	B		0.5	U		0.39	U			
7440-22-4	Silver		2.3	U		0.9	U		0.7	U			
7440-28-0	Thallium		1.4	U		0.55	U		0.43	U			
7440-31-5	Tin		208	U		80.8	U		63.3	U			
7440-62-2	Vanadium		3.8	B		2.9	B		2.5	B			
7440-66-6	Zinc		3.7	U		48.6	U		49.3	B			
	Cyanide		7.4	B			NR			NR			

*Blank entries indicate that sample was not analyzed for that analyte group

METALS AND CYANIDE: SEDIMENTS AND SURFACE WATER

A:\MPTDAT2.WK1		MPT-2-SW-7		MPT-2-SW-7A	
LOCATION:		WATER		WATER	
SAMPLE MATRIX:		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740	
LAB NUMBER:					
CAS RN	Common name	µg/l Conc.	Qual.	µg/l Conc.	Qual.
7440-36-0	Antimony	40	U	40	U
7440-38-2	Arsenic	2.6	B	2.2	B
7440-39-3	Barium	22.3	B	21.3	B
7440-41-7	Beryllium	0.1	U	0.1	U
7440-43-9	Cadmium	1.6	U	1.6	U
7440-47-3	Chromium	1.9	U	1.9	U
7440-48-4	Cobalt	5.1	U	5.1	U
7440-50-8	Copper	8.7	B	3.8	B
7440-92-1	Lead	3.3		3.3	
7440-97-6	Mercury	0.16	U	0.16	U
7440-02-0	Nickel	7	U	7	U
7440-49-2	Selenium	1.4	B	7.7	
7440-22-4	Silver	2.3	U	2.3	U
7440-28-0	Thallium	1.4	U	1.4	U
7440-31-5	Tin	208	U	208	U
7440-62-2	Vanadium	2.7	U	2.7	U
7440-66-6	Zinc	34.4		25.7	
	Cyanide	4.7	B	5.3	B

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-2-SD-8	MPT-2-SD-9	MPT-2-SD-9DL	MPT-2-SW-9	MPT-13-SD-1
LOCATION:		SOIL	SOIL	SOIL	WATER	SOIL
SAMPLE MATRIX:		02/12/92	01/23/92	01/23/92	01/23/92	01/23/92
DATE SAMPLED:		20902	20740	20740	20740	20740
LAB NUMBER:						
CAS RN	Common name	mg/Kg Conc.	mg/Kg Conc.	mg/Kg Conc.	µg/l Conc.	mg/Kg Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
7440-36-0	Antimony	3.3 U	9.8 U		40 U	11.7 U
7440-38-2	Arsenic	1.2 B	0.51 B		4.3 B	0.42 B
7440-39-3	Barium	4.7 B	3.8 B		11.7 B	4.1 B
7440-41-7	Beryllium	0.16 B	0.026 U		0.1 U	0.031 U
7440-43-9	Cadmium	0.89 U	0.39 U		2.6 B	1.1 B
7440-47-3	Chromium	4.7	2.7		1.9 U	3.3
7440-48-4	Cobalt	2.1 B	1.4 B		5.1 U	2.5 B
7440-50-8	Copper	4.5 B	1.6 B		24.1 B	4.1 B
7440-92-1	Lead	2.8	3.5		3.2	5.3
7440-97-6	Mercury	0 U	0.048 U		0.16 U	0.058 U
7440-02-0	Nickel	4 B	1.7 U		7 U	2 U
7440-49-2	Selenium	0.37 U	0.31 U		2.3 B	0.38 U
7440-22-4	Silver	0.59 B	0.56 U		2.3 U	0.68 U
7440-28-0	Thallium	0.5 U	0.34 U		1.4 U	0.41 U
7440-31-5	Tin	8 U	50.8 U		208 U	60.9 U
7440-62-2	Vanadium	4.5 B	1.4 B		2.7 U	3.1 B
7440-66-6	Zinc	12.5	12		3.7 U	37.6
	Cyanide	NR	NR		5.4 B	NR

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SEDIMENTS AND SURFACE WATER

A:\MPTDAT3.WK1		MPT-13-SD-1DL		MPT-13-SD-2		MPT-13-SD-3		MPT-13-SD-3DL	
LOCATION:		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/23/92		01/23/92		01/23/92		01/23/92	
DATE SAMPLED:		20740		20740		20740		20740	
LAB NUMBER:		20740		20740		20740		20740	
CAS RN	Common name	mg/Kg Conc.	Qual.	mg/Kg Conc.	Qual.	mg/Kg Conc.	Qual.	mg/Kg Conc.	Qual.
7440-36-0	Antimony			11.1	U	10.5	U		
7440-38-2	Arsenic			0.33	B	0.69	B		
7440-39-3	Barium			1.8	B	5.2	B		
7440-41-7	Beryllium			0.029	U	0.027	U		
7440-43-9	Cadmium			0.45	U	0.66	B		
7440-47-3	Chromium			1.7	B	3.7	B		
7440-48-4	Cobalt			1.4	U	1.7	B		
7440-50-8	Copper			0.43	B	5.4	B		
7440-92-1	Lead			0.97	B	7.5	B		
7440-97-6	Mercury			0.092	U	0.076	U		
7440-02-0	Nickel			1.9	U	1.8	U		
7440-49-2	Selenium			0.36	U	0.34	U		
7440-22-4	Silver			0.64	U	0.6	U		
7440-28-0	Thallium			0.39	U	0.37	U		
7440-31-5	Tin			58	U	54.5	U		
7440-62-2	Vanadium			1	B	3.7	B		
7440-66-6	Zinc			4.6	B	17.2	B		
	Cyanide				NR		NR		

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SEDIMENTS AND SURFACE WATER

A:\MPTDAT4.WK1		MPT-2-SW-8	
LOCATION:		WATER	
SAMPLE MATRIX:		02/12/92	
DATE SAMPLED:		20902	
LAB NUMBER:			
CAS RN	Common name	µg/l Conc.	Qual.
7440-36-0	Antimony	29.8	B
7440-38-2	Arsenic	1.3	B
7440-39-3	Barium	11.6	B
7440-41-7	Beryllium	0.3	U
7440-43-9	Cadmium	1	U
7440-70-2	Calcium	181000	
7440-47-3	Chromium	2	U
7440-48-4	Cobalt	3.1	U
7440-50-8	Copper	1.4	U
7440-89-6	Iron	4830	
7440-92-1	Lead	0.7	U
7440-95-4	Magnesium	317000	
7440-96-5	Manganese	247	
7440-97-6	Mercury	0.1	U
7440-02-0	Nickel	6.5	U
7440-49-2	Selenium	6	U
7440-22-4	Silver	1.2	U
7440-23-5	Sodium	2720000	
7440-28-0	Thallium	0.9	U
7440-62-2	Vanadium	6.1	B
7440-66-6	Zinc	6.3	B
7440-31-5	Tin	14.5	U
	Cyanide	3	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/09/92		02/10/92	
DATE SAMPLED:		20884		20884		20864		20866		20877	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
74-87-3	Chloromethane	10	U	10	U	10	U	10	U	10	U
74-83-9	Bromomethane	10	U	10	U	10	U	10	U	10	U
75-01-4	Vinyl chloride	10	U	10	U	10	U	10	U	10	U
75-00-3	Chloroethane	10	U	10	U	10	U	10	U	10	U
75-09-2	Methylene chloride	8	B	3	J	5	B	6	B	2	BJ
67-64-1	Acetone	8	BJ	5	BJ	9	BJ	10	B	14	B
75-15-0	Carbon disulfide	5	U	5	U	5	U	2	J	3	J
75-69-4	Trichlorofluoromethane	5	U	5	U	5	U	5	U	5	U
75-35-4	1,1-Dichloroethylene	5	U	5	U	5	U	5	U	5	U
75-34-3	1,1-Dichloroethane	5	U	5	U	5	U	5	U	5	U
540-59-0	1,2-Dichloroethene (total)	5	U	5	U	5	U	5	U	5	U
67-66-3	Chloroform	5	U	5	U	5	U	5	U	5	U
107-06-2	1,2-Dichloroethane	5	U	5	U	5	U	5	U	5	U
78-93-3	2-Butanone	5	U	5	U	5	U	5	U	5	U
71-55-6	1,1,1-Trichloroethane	10	U	10	U	10	U	10	U	10	U
56-23-5	Carbon tetrachloride	5	U	5	U	5	U	5	U	5	U
108-05-4	Vinyl acetate	10	U	10	U	10	U	10	U	10	U
75-27-4	Bromodichloromethane	5	U	5	U	5	U	5	U	5	U
78-87-5	1,2-Dichloropropane	5	U	5	U	5	U	5	U	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U	5	U	5	U	5	U	5	U
79-01-6	Trichloroethene	5	U	5	U	5	U	5	U	5	U
124-48-1	Dibromochloromethane	5	U	5	U	5	U	5	U	5	U
79-00-5	1,1,2-Trichloroethane	5	U	5	U	5	U	5	U	5	U
71-43-2	Benzene	5	U	5	U	5	U	5	U	2	J

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW1-1	MPT-2-MW2-1	MPT-2-MW2-1D	MPT-2-MW3-1	MPT-2-MW4-1
LOCATION:		WATER	WATER	WATER	WATER	WATER
SAMPLE MATRIX:		02/11/92	02/11/92	02/11/92	02/09/92	02/10/92
DATE SAMPLED:		20884	20884	20884	20866	20877
LAB NUMBER:						
CAS RN	Common name	µg/l	µg/l	µg/l	µg/l	µg/l
		Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	5	5	5	5
110-75-8	2-Chloroethylvinylether	10	10	10	10	10
75-25-2	Bromoform	5	5	5	5	5
591-78-6	2-Hexanone	10	10	10	10	10
108-10-1	4-Methyl-2-Pentanone	10	10	10	10	10
127-18-4	Tetrachloroethene	5	5	5	5	5
79-34-5	1,1,2,2-Tetrachloroethane	5	5	5	5	5
108-88-3	Toluene	5	5	5	5	5
108-90-7	Chlorobenzene	5	5	5	5	5
100-41-4	Ethylbenzene	5	5	5	5	5
100-42-5	Styrene	5	5	5	5	5
1330-20-7	Xylene (total)	5	5	5	5	5
541-73-1	1,3-Dichlorobenzene	5	5	5	5	5
106-46-7	1,4-Dichlorobenzene	5	5	5	5	5
95-50-1	1,2-Dichlorobenzene	5	5	5	5	5
107-02-8	Acrolein	100	100	100	100	100
74-88-4	Iodomethane	10	10	10	10	10
107-13-1	Acrylonitrile	100	100	100	100	100
74-95-3	Dibromomethane	5	5	5	5	5
97-63-2	Ethyl Methacrylate	5	5	5	5	5
96-18-4	1,2,3-Trichloropropane	5	5	5	5	5
110-57-6	trans-1,4-Dichloro-2-butene	5	5	5	5	5
75-05-8	Acetonitrile	100	100	100	100	100
107-05-1	3-Chloropropene	5	5	5	5	5

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:IMPTDATA4.WK1		MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/09/92		02/10/92	
DATE SAMPLED:		20884		20884		20884		20866		20877	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
107-12-0	Propionitrile	100	U	100	U	100	U	100	U	100	U
126-98-7	Methacrylonitrile	5	U	5	U	5	U	5	U	5	U
123-91-1	1,4-Dioxane	200	U	200	U	200	U	200	U	200	U
80-62-6	Methyl methacrylate	10	U	10	U	10	U	10	U	10	U
106-93-4	1,2-Dibromoethane	5	U	5	U	5	U	5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U	5	U	5	U	5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U	10	U	10	U	10	U	10	U
76-01-7	Pentachloroethane	10	U	10	U	10	U	10	U	10	U
78-83-1	Isobutyl alcohol	200	U	200	U	200	U	200	U	200	U
126-99-8	Chloroprene	200	U	200	U	200	U	200	U	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:		20877		20877		20884		20884		20884	
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
74-87-3	Chloromethane	10	U	10	U	10	U	10	U	10	U
74-83-9	Bromomethane	10	U	10	U	10	U	10	U	10	U
75-01-4	Vinyl chloride	10	U	10	U	10	U	10	U	10	U
75-00-3	Chloroethane	10	U	10	U	10	U	10	U	10	U
75-09-2	Methylene chloride	2	BJ	2	BJ	3	BJ	2	BJ	5	U
67-64-1	Acetone	22	B	13	B	5	BJ	4	BJ	14	B
75-15-0	Carbon disulfide	5	U	5	U	5	U	5	U	5	U
75-69-4	Trichlorofluoromethane	5	U	5	U	5	U	5	U	5	U
75-35-4	1,1-Dichloroethylene	5	U	5	U	5	U	5	U	5	U
75-34-3	1,1-Dichloroethane	5	U	5	U	5	U	5	U	5	U
540-59-0	1,2-Dichloroethene (total)	5	U	5	U	5	U	5	U	5	U
67-66-3	Chloroform	5	U	5	U	5	U	5	U	5	U
107-06-2	1,2-Dichloroethane	5	U	5	U	5	U	5	U	5	U
78-93-3	2-Butanone	10	U	10	U	10	U	10	U	10	U
71-55-6	1,1,1-Trichloroethane	5	U	5	U	5	U	5	U	5	U
56-23-5	Carbon tetrachloride	5	U	5	U	5	U	5	U	5	U
108-05-4	Vinyl acetate	10	U	10	U	10	U	10	U	10	U
75-27-4	Bromodichloromethane	5	U	5	U	5	U	5	U	5	U
78-87-5	1,2-Dichloropropane	5	U	5	U	5	U	5	U	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U	5	U	5	U	5	U	5	U
79-01-6	Trichloroethene	5	U	5	U	5	U	5	U	5	U
124-48-1	Dibromochloromethane	5	U	5	U	5	U	5	U	5	U
79-00-5	1,1,2-Trichloroethane	5	U	5	U	5	U	5	U	5	U
71-43-2	Benzene	5	U	5	U	5	U	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:		20877		20877		20884		20884		20884	
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U	5	U	5	U	5	U	5	U
110-75-8	2-Chloroethylvinylether	10	U	10	U	10	U	10	U	10	U
75-25-2	Bromoform	5	U	5	U	5	U	5	U	5	U
591-78-6	2-Hexanone	10	U	10	U	10	U	10	U	10	U
108-10-1	4-Methyl-2-Pentanone	10	U	10	U	10	U	10	U	10	U
127-18-4	Tetrachloroethene	5	U	5	U	5	U	5	U	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U	5	U	5	U	5	U	5	U
108-88-3	Toluene	5	U	5	U	5	U	5	U	5	U
108-90-7	Chlorobenzene	5	U	5	U	5	U	5	U	5	U
100-41-4	Ethylbenzene	5	U	5	U	5	U	5	U	5	U
100-42-5	Styrene	5	U	5	U	5	U	5	U	5	U
1330-20-7	Xylene (total)	5	U	5	U	5	U	5	U	5	U
541-73-1	1,3-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
106-46-7	1,4-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
95-50-1	1,2-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
107-02-8	Acrolein	100	U	100	U	100	U	100	U	100	U
74-88-4	Iodomethane	10	U	10	U	10	U	10	U	10	U
107-13-1	Acrylonitrile	100	U	100	U	100	U	100	U	100	U
74-95-3	Dibromomethane	5	U	5	U	5	U	5	U	5	U
97-63-2	Ethyl Methacrylate	5	U	5	U	5	U	5	U	5	U
96-18-4	1,2,3-Trichloropropane	5	U	5	U	5	U	5	U	5	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U	5	U	5	U	5	U	5	U
75-05-8	Acetonitrile	100	U	100	U	100	U	100	U	100	U
107-05-1	3-Chloropropene	5	U	5	U	5	U	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:		20877		20877		20884		20884		20884	
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
107-12-0	Propionitrile	100	U	100	U	100	U	100	U	100	U
126-98-7	Methacrylonitrile	5	U	5	U	5	U	5	U	5	U
123-91-1	1,4-Dioxane	200	U	200	U	200	U	200	U	200	U
80-62-6	Methyl methacrylate	10	U	10	U	10	U	10	U	10	U
106-93-4	1,2-Dibromoethane	5	U	5	U	5	U	5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U	5	U	5	U	5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U	10	U	10	U	10	U	10	U
76-01-7	Pentachloroethane	10	U	10	U	10	U	10	U	10	U
78-83-1	Isobutyl alcohol	200	U	200	U	200	U	200	U	200	U
126-99-8	Chloroprene	200	U	200	U	200	U	200	U	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/09/92		02/09/92		02/10/92		02/05/92		02/05/92	
DATE SAMPLED:		20866		20866		20877		20837		20837	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
74-87-3	Chloromethane	10	U	10	U	10	U	10	U	10	U
74-83-9	Bromomethane	10	U	10	U	10	U	10	U	10	U
75-01-4	Vinyl chloride	10	U	10	U	10	U	10	U	10	U
75-00-3	Chloroethane	10	U	10	U	10	U	10	U	10	U
75-09-2	Methylene chloride	6	B	6	B	15	B	3	J	2	J
67-64-1	Acetone	6	BJ	29	B	20	B	15	B	41	B
75-15-0	Carbon disulfide	5	U	2	J	1	J	5	U	5	U
75-69-4	Trichlorofluoromethane	5	U	5	U	5	U	5	U	5	U
75-35-4	1,1-Dichloroethylene	5	U	5	U	5	U	5	U	5	U
75-34-3	1,1-Dichloroethane	5	U	5	U	5	U	5	U	5	U
540-59-0	1,2-Dichloroethene (total)	5	U	5	U	5	U	5	U	5	U
67-66-3	Chloroform	5	U	5	U	5	U	5	U	5	U
107-06-2	1,2-Dichloroethane	5	U	5	U	5	U	5	U	5	U
78-93-3	2-Butanone	10	U	9	J	10	U	10	U	10	U
71-55-6	1,1,1-Trichloroethane	5	U	5	U	5	U	5	U	5	U
56-23-5	Carbon tetrachloride	5	U	5	U	5	U	5	U	5	U
108-05-4	Vinyl acetate	10	U	10	U	10	U	10	U	10	U
75-27-4	Bromodichloromethane	5	U	5	U	5	U	5	U	5	U
78-87-5	1,2-Dichloropropane	5	U	5	U	5	U	5	U	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U	5	U	5	U	5	U	5	U
79-01-6	Trichloroethene	5	U	5	U	5	U	5	U	5	U
124-48-1	Dibromochloromethane	5	U	5	U	5	U	5	U	5	U
79-00-5	1,1,2-Trichloroethane	5	U	5	U	5	U	5	U	5	U
71-43-2	Benzene	5	U	5	U	5	U	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/09/92		02/09/92		02/10/92		02/05/92		02/05/92	
DATE SAMPLED:		20866		20866		20877		20837		20837	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U	5	U	5	U	5	U	5	U
110-75-8	2-Chloroethylvinylether	10	U	10	U	10	U	10	U	10	U
75-25-2	Bromoform	5	U	5	U	5	U	5	U	5	U
591-78-6	2-Hexanone	10	U	10	U	10	U	10	U	10	U
108-10-1	4-Methyl-2-Pentanone	10	U	10	U	10	U	10	U	10	U
127-18-4	Tetrachloroethene	5	U	5	U	5	U	5	U	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U	5	U	5	U	5	U	5	U
108-88-3	Toluene	5	U	5	U	5	U	5	U	5	U
108-90-7	Chlorobenzene	5	U	5	U	5	U	5	U	5	U
100-41-4	Ethylbenzene	5	U	5	U	5	U	5	U	5	U
100-42-5	Styrene	5	U	5	U	5	U	5	U	5	U
1330-20-7	Xylene (total)	5	U	5	U	5	U	5	U	5	U
541-73-1	1,3-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
106-46-7	1,4-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
95-50-1	1,2-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
107-02-8	Acrolein	100	U	100	U	100	U	100	U	100	U
74-88-4	Iodomethane	10	U	10	U	10	U	10	U	10	U
107-13-1	Acrylonitrile	100	U	100	U	100	U	100	U	100	U
74-95-3	Dibromomethane	5	U	5	U	5	U	5	U	5	U
97-63-2	Ethyl Methacrylate	5	U	5	U	5	U	5	U	5	U
96-18-4	1,2,3-Trichloropropane	5	U	5	U	5	U	5	U	5	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U	5	U	5	U	5	U	5	U
75-05-8	Acetonitrile	100	U	100	U	100	U	100	U	100	U
107-05-1	3-Chloropropene	5	U	5	U	5	U	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

CAS RN	Common name	MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile	100	U	100	U	100	U	100	U	100	U
126-98-7	Methacrylonitrile	5	U	5	U	5	U	5	U	5	U
123-91-1	1,4-Dioxane	200	U	200	U	200	U	200	U	200	U
80-62-6	Methyl methacrylate	10	U	10	U	10	U	10	U	10	U
106-93-4	1,2-Dibromoethane	5	U	5	U	5	U	5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U	5	U	5	U	5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U	10	U	10	U	10	U	10	U
76-01-7	Pentachloroethane	10	U	10	U	10	U	10	U	10	U
78-83-1	Isobutyl alcohol	200	U	200	U	200	U	200	U	200	U
126-99-8	Chloroprene	200	U	200	U	200	U	200	U	200	U

A:\MPTDAT5.WK1
 LOCATION:
 SAMPLE MATRIX:
 DATE SAMPLED:
 LAB NUMBER:

WATER
 02/09/92
 20866

WATER
 02/09/92
 20866

WATER
 02/10/92
 20877

WATER
 02/05/92
 20837

WATER
 02/05/92
 20837

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92		02/10/92	
DATE SAMPLED:		20837		20902		20877		20877		20877	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
74-87-3	Chloromethane	10	U	10	U	10	U	10	U	10	U
74-83-9	Bromomethane	10	U	10	U	10	U	10	U	10	U
75-01-4	Vinyl chloride	10	U	10	U	10	U	10	U	10	U
75-00-3	Chloroethane	10	U	10	U	10	U	10	U	10	U
75-09-2	Methylene chloride	3	J	16	B	4	BJ	6	B	6	B
67-64-1	Acetone	38	B	68	B	9	BJ	51	B	51	B
75-15-0	Carbon disulfide	5	U	10	U	5	U	3	J	3	J
75-69-4	Trichlorofluoromethane	5	U	5	U	5	U	5	U	5	U
75-35-4	1,1-Dichloroethylene	5	U	5	U	5	U	5	U	5	U
75-34-3	1,1-Dichloroethane	5	U	5	U	5	U	5	U	5	U
540-59-0	1,2-Dichloroethene (total)	5	U	5	U	5	U	5	U	5	U
67-66-3	Chloroform	5	U	5	U	5	U	5	U	5	U
107-06-2	1,2-Dichloroethane	5	U	5	U	5	U	5	U	5	U
78-93-3	2-Butanone	10	U	13	U	10	U	10	U	10	U
71-55-6	1,1,1-Trichloroethane	5	U	5	U	5	U	5	U	5	U
56-23-5	Carbon tetrachloride	5	U	5	U	5	U	5	U	5	U
108-05-4	Vinyl acetate	10	U	10	U	10	U	10	U	10	U
75-27-4	Bromodichloromethane	5	U	5	U	5	U	5	U	5	U
78-87-5	1,2-Dichloropropane	5	U	5	U	5	U	5	U	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U	5	U	5	U	5	U	5	U
79-01-6	Trichloroethene	5	U	5	U	5	U	5	U	5	U
124-48-1	Dibromochloromethane	5	U	5	U	5	U	5	U	5	U
79-00-5	1,1,2-Trichloroethane	5	U	5	U	5	U	5	U	5	U
71-43-2	Benzene	5	U	5	U	5	U	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1R	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92	
DATE SAMPLED:		20837		20902		20877		20877	
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U	5	U	5	U	5	U
110-75-8	2-Chloroethylvinylether	10	U	10	U	10	U	10	U
75-25-2	Bromoform	5	U	5	U	5	U	5	U
591-78-6	2-Hexanone	10	U	10	U	10	U	10	U
108-10-1	4-Methyl-2-Pentanone	10	U	10	U	10	U	10	U
127-18-4	Tetrachloroethene	5	U	5	U	5	U	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U	5	U	5	U	5	U
108-88-3	Toluene	5	U	5	U	5	U	16	
108-90-7	Chlorobenzene	5	U	5	U	5	U	5	U
100-41-4	Ethylbenzene	5	U	5	U	5	U	5	U
100-42-5	Styrene	5	U	5	U	5	U	5	U
1330-20-7	Xylene (total)	5	U	5	U	5	U	5	U
541-73-1	1,3-Dichlorobenzene	5	U	5	U	5	U	2	J
106-46-7	1,4-Dichlorobenzene	5	U	5	U	5	U	5	U
95-50-1	1,2-Dichlorobenzene	5	U	5	U	5	U	5	U
107-02-8	Acrolein	100	U	100	U	100	U	100	U
74-88-4	Iodomethane	10	U	10	U	10	U	10	U
107-13-1	Acrylonitrile	100	U	100	U	100	U	100	U
74-95-3	Dibromomethane	5	U	5	U	5	U	5	U
97-63-2	Ethyl Methacrylate	5	U	5	U	5	U	5	U
96-18-4	1,2,3-Trichloropropane	5	U	5	U	5	U	5	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U	5	U	5	U	5	U
75-05-8	Acetonitrile	100	U	100	U	100	U	100	U
107-05-1	3-Chloropropene	5	U	5	U	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92		02/10/92	
DATE SAMPLED:		20837		20902		20877		20877		20877	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile	100	U	100	U	100	U	100	U	100	U
126-98-7	Methacrylonitrile	5	U	5	U	5	U	5	U	5	U
123-91-1	1,4-Dioxane	200	U	200	U	200	U	200	U	200	U
80-62-6	Methyl methacrylate	10	U	10	U	10	U	10	U	10	U
106-93-4	1,2-Dibromoethane	5	U	5	U	5	U	5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U	5	U	5	U	5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U	10	U	10	U	10	U	10	U
76-01-7	Pentachloroethane	10	U	10	U	10	U	10	U	10	U
78-83-1	Isobutyl alcohol	200	U	200	U	200	U	200	U	200	U
126-99-8	Chloroprene	200	U	200	U	200	U	200	U	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92		02/12/92	
DATE SAMPLED:		20877		20931		20902		20902	
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
74-87-3	Chloromethane	10	U	10	U	10	U	10	U
74-83-9	Bromomethane	10	U	10	U	10	U	10	U
75-01-4	Vinyl chloride	10	U	10	U	10	U	10	U
75-00-3	Chloroethane	10	U	10	U	10	U	10	U
75-09-2	Methylene chloride	5	B	4	J	7			
67-64-1	Acetone	9	BJ	28	B	5	BJ		
75-15-0	Carbon disulfide	5	U	5	U	5	U		
75-69-4	Trichlorofluoromethane	5	U	5	U	5	U		
75-35-4	1,1-Dichloroethylene	5	U	5	U	5	U		
75-34-3	1,1-Dichloroethane	5	U	5	U	5	U		
540-59-0	1,2-Dichloroethene (total)	5	U	5	U	5	U		
67-66-3	Chloroform	5	U	1	J	5	U		
107-06-2	1,2-Dichloroethane	5	U	5	U	5	U		
78-93-3	2-Butanone	10	U	10	U	10	U		
71-55-6	1,1,1-Trichloroethane	5	U	5	U	5	U		
56-23-5	Carbon tetrachloride	5	U	5	U	5	U		
108-05-4	Vinyl acetate	10	U	10	U	10	U		
75-27-4	Bromodichloromethane	5	U	5	U	5	U		
78-87-5	1,2-Dichloropropane	5	U	5	U	5	U		
10061-01-5	cis-1,3-Dichloropropene	5	U	5	U	5	U		
79-01-6	Trichloroethene	5	U	5	U	5	U		
124-48-1	Dibromochloromethane	5	U	5	U	5	U		
79-00-5	1,1,2-Trichloroethane	5	U	5	U	5	U		
71-43-2	Benzene	5	U	5	U	5	U		

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1		
LOCATION:		WATER		WATER		WATER		WATER		
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92		02/12/92		
DATE SAMPLED:		20877		20931		20902		20902		
LAB NUMBER:										
CAS RN	Common name	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U	5	U	5	U	5	U	
110-75-8	2-Chloroethylvinylether	10	U	10	U	10	U	10	U	
75-25-2	Bromoform	5	U	5	U	5	U	5	U	
591-78-6	2-Hexanone	10	U	10	U	10	U	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	10	U	10	U	10	U	
127-18-4	Tetrachloroethene	5	U	5	U	5	U	5	U	
79-34-5	1,1,2,2-Tetrachloroethane	5	U	5	U	5	U	5	U	
108-88-3	Toluene	5	U	5	U	5	U	5	U	
108-90-7	Chlorobenzene	5	U	5	U	5	U	5	U	
100-41-4	Ethylbenzene	5	U	5	U	5	U	5	U	
100-42-5	Styrene	5	U	5	U	5	U	5	U	
1330-20-7	Xylene (total)	5	U	5	U	5	U	5	U	
541-73-1	1,3-Dichlorobenzene	5	U	5	U	5	U	5	U	
106-46-7	1,4-Dichlorobenzene	5	U	5	U	5	U	5	U	
95-50-1	1,2-Dichlorobenzene	5	U	5	U	5	U	5	U	
107-02-8	Acrolein	100	U	100	U	100	U	100	U	
74-88-4	Iodomethane	10	U	10	U	10	U	10	U	
107-13-1	Acrylonitrile	100	U	100	U	100	U	100	U	
74-95-3	Dibromomethane	5	U	5	U	5	U	5	U	
97-63-2	Ethyl Methacrylate	5	U	5	U	5	U	5	U	
96-18-4	1,2,3-Trichloropropane	5	U	5	U	5	U	5	U	
110-57-6	trans-1,4-Dichloro-2-butene	5	U	5	U	5	U	5	U	
75-05-8	Acetonitrile	100	U	100	U	100	U	100	U	
107-05-1	3-Chloropropene	5	U	5	U	5	U	5	U	

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92		02/12/92	
DATE SAMPLED:		20877		20931		20902		20902	
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile	100	U	100	U	100	U	100	U
126-98-7	Methacrylonitrile	5	U	5	U	5	U	5	U
123-91-1	1,4-Dioxane	200	U	200	U	200	U	200	U
80-62-6	Methyl methacrylate	10	U	10	U	10	U	10	U
106-93-4	1,2-Dibromoethane	5	U	5	U	5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U	5	U	5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U	10	U	10	U	10	U
76-01-7	Pentachloroethane	10	U	10	U	10	U	10	U
78-83-1	Isobutyl alcohol	200	U	200	U	200	U	200	U
126-99-8	Chloroprene	200	U	200	U	200	U	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1	MPT-13-MW2-1	MPT-13-MW3-1	MPT-13-MW4-1	MPT-13-MW5-1
LOCATION:		WATER	WATER	WATER	WATER	WATER
SAMPLE MATRIX:		02/11/92	02/11/92	02/11/92	02/05/92	02/05/92
DATE SAMPLED:		20884	20884	20884	20850	20850
LAB NUMBER:		20884	20884	20884	20850	20850
CAS RN	Common name	µg/l	µg/l	µg/l	µg/l	µg/l
		Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
74-87-3	Chloromethane	10	10	10	10	10
74-83-9	Bromomethane	10	10	10	10	10
75-01-4	Vinyl chloride	10	10	10	10	10
75-00-3	Chloroethane	10	10	10	10	10
75-09-2	Methylene chloride	8	10	11	4	2
67-64-1	Acetone	6	5	7	61	10
75-15-0	Carbon disulfide	5	5	1	5	5
75-69-4	Trichlorofluoromethane	5	5	5	5	5
75-35-4	1,1-Dichloroethylene	5	5	5	5	5
75-34-3	1,1-Dichloroethane	5	5	5	5	5
540-59-0	1,2-Dichloroethene (total)	5	5	5	5	5
67-66-3	Chloroform	5	5	5	5	5
107-06-2	1,2-Dichloroethane	5	5	5	5	5
78-93-3	2-Butanone	10	10	10	10	10
71-55-6	1,1,1-Trichloroethane	5	5	5	5	5
56-23-5	Carbon tetrachloride	5	5	5	5	5
108-05-4	Vinyl acetate	10	10	10	10	10
75-27-4	Bromodichloromethane	5	5	5	5	5
78-87-5	1,2-Dichloropropane	5	5	5	5	5
10061-01-5	cis-1,3-Dichloropropene	5	5	5	5	5
79-01-6	Trichloroethene	5	5	5	5	5
124-48-1	Dibromochloromethane	5	5	5	5	5
79-00-5	1,1,2-Trichloroethane	5	5	5	5	5
71-43-2	Benzene	5	5	5	5	5

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:		20884		20884		20884		20850		20850	
CAS RN	Common name	µg/l	Qual.								
10061-02-6	trans-1,3-Dichloropropene	5	U	5	U	5	U	5	U	5	U
110-75-8	2-Chloroethylvinylether	10	U								
75-25-2	Bromoform	5	U	5	U	5	U	5	U	5	U
591-78-6	2-Hexanone	10	U								
108-10-1	4-Methyl-2-Pentanone	10	U								
127-18-4	Tetrachloroethene	5	U	5	U	5	U	5	U	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U	5	U	5	U	5	U	5	U
108-88-3	Toluene	5	U	5	U	5	U	5	U	5	U
108-90-7	Chlorobenzene	5	U	5	U	5	U	5	U	5	U
100-41-4	Ethylbenzene	5	U	5	U	5	U	5	U	5	U
100-42-5	Styrene	5	U	5	U	5	U	5	U	5	U
1330-20-7	Xylene (total)	5	U	5	U	5	U	5	U	5	U
541-73-1	1,3-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
106-46-7	1,4-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
95-50-1	1,2-Dichlorobenzene	5	U	5	U	5	U	5	U	5	U
107-02-8	Acrolein	100	U								
74-88-4	Iodomethane	10	U								
107-13-1	Acrylonitrile	100	U								
74-95-3	Dibromomethane	5	U	5	U	5	U	5	U	5	U
97-63-2	Ethyl Methacrylate	5	U	5	U	5	U	5	U	5	U
96-18-4	1,2,3-Trichloropropane	5	U	5	U	5	U	5	U	5	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U	5	U	5	U	5	U	5	U
75-05-8	Acetonitrile	100	U								
107-05-1	3-Chloropropene	5	U	5	U	5	U	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:		20884		20884		20884		20850		20850	
CAS RN	Common name	µg/l									
		Conc.	Qual.								
107-12-0	Propionitrile	100	U								
126-98-7	Methacrylonitrile	5	U	5	U	5	U	5	U	5	U
123-91-1	1,4-Dioxane	200	U								
80-62-6	Methyl methacrylate	10	U								
106-93-4	1,2-Dibromoethane	5	U	5	U	5	U	5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U	5	U	5	U	5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U								
76-01-7	Pentachloroethane	10	U								
78-83-1	Isobutyl alcohol	200	U								
126-99-8	Chloroprene	200	U								

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1	MPT-22-MW1-1	MPT-1-MW1-1	MPT-S-1-1
LOCATION:		WATER	WATER	WATER	WATER
SAMPLE MATRIX:		02/11/92	02/05/92	02/12/92	02/12/92
DATE SAMPLED:		20884	20937	20902	20902
LAB NUMBER:					
CAS RN	Common name	µg/l	µg/l	µg/l	µg/l
		Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.
74-87-3	Chloromethane	10	10	10	10
		U	U	U	U
74-83-9	Bromomethane	10	10	10	10
		U	U	U	U
75-01-4	Vinyl chloride	10	2	10	10
		U	U	U	U
75-00-3	Chloroethane	10	10	10	10
		U	U	U	U
75-09-2	Methylene chloride	7	3	7	7
		B	J	B	B
67-64-1	Acetone	16	8	3	5
		B	BJ	BJ	BJ
75-15-0	Carbon disulfide	5	5	5	1
		U	U	U	J
75-69-4	Trichlorofluoromethane	5	5	5	5
		U	U	U	U
75-35-4	1,1-Dichloroethylene	5	5	5	5
		U	U	U	U
75-34-3	1,1-Dichloroethane	5	5	5	5
		U	U	U	U
540-59-0	1,2-Dichloroethene (total)	5	5	5	5
		U	U	U	U
67-66-3	Chloroform	5	5	5	5
		U	U	U	U
107-06-2	1,2-Dichloroethane	5	5	5	5
		U	U	U	U
78-93-3	2-Butanone	10	10	10	10
		U	U	U	U
71-55-6	1,1,1-Trichloroethane	5	5	5	5
		U	U	U	U
56-23-5	Carbon tetrachloride	5	3	5	5
		U	U	U	U
108-05-4	Vinyl acetate	10	10	10	10
		U	U	U	U
75-27-4	Bromodichloromethane	5	5	5	5
		U	U	U	U
78-87-5	1,2-Dichloropropane	5	5	5	5
		U	U	U	U
10061-01-5	cis-1,3-Dichloropropene	5	5	5	5
		U	U	U	U
79-01-6	Trichloroethene	5	5	5	5
		U	U	U	U
124-48-1	Dibromochloromethane	5	5	5	5
		U	U	U	U
79-00-5	1,1,2-Trichloroethane	5	5	5	5
		U	U	U	U
71-43-2	Benzene	5	1	5	5
		U	U	U	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1		MPT-22-MW1-1		MPT-1-MW1-1		MPT-S-1-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/05/92		02/12/92		02/12/92	
DATE SAMPLED:		20884		20837		20902		20902	
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U	5	U	5	U	5	U
110-75-8	2-Chloroethylvinylether	10	U	10	U	10	U	10	U
75-25-2	Bromoform	5	U	5	U	5	U	5	U
591-78-6	2-Hexanone	10	U	10	U	10	U	10	U
108-10-1	4-Methyl-2-Pentanone	10	U	10	U	10	U	10	U
127-18-4	Tetrachloroethene	5	U	3	U	5	U	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U	5	U	5	U	5	U
108-88-3	Toluene	5	U	5	U	5	U	5	U
108-90-7	Chlorobenzene	5	U	5	U	5	U	5	U
100-41-4	Ethylbenzene	5	U	5	U	5	U	5	U
100-42-5	Styrene	5	U	5	U	5	U	5	U
1330-20-7	Xylene (total)	5	U	5	U	5	U	5	U
541-73-1	1,3-Dichlorobenzene	5	U	5	U	5	U	5	U
106-46-7	1,4-Dichlorobenzene	5	U	5	U	5	U	5	U
95-50-1	1,2-Dichlorobenzene	5	U	5	U	5	U	5	U
107-02-8	Acrolein	100	U	100	U	100	U	100	U
74-88-4	Iodomethane	10	U	10	U	10	U	10	U
107-13-1	Acrylonitrile	100	U	100	U	100	U	100	U
74-95-3	Dibromomethane	5	U	5	U	5	U	5	U
97-63-2	Ethyl Methacrylate	5	U	5	U	5	U	5	U
96-18-4	1,2,3-Trichloropropane	5	U	5	U	5	U	5	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U	5	U	5	U	5	U
75-05-8	Acetonitrile	100	U	100	U	100	U	100	U
107-05-1	3-Chloropropene	5	U	5	U	5	U	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA6.WK1		MPT-13-MW6-1		MPT-22-MW1-1		MPT-1-MW1-1		MPT-S-1-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/05/92		02/12/92		02/12/92	
DATE SAMPLED:		20884		20837		20902		20902	
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile	100	U	100	U	100	U	100	U
126-98-7	Methacrylonitrile	5	U	5	U	5	U	5	U
123-91-1	1,4-Dioxane	200	U	200	U	200	U	200	U
80-62-6	Methyl methacrylate	10	U	10	U	10	U	10	U
106-93-4	1,2-Dibromoethane	5	U	5	U	5	U	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U	5	U	5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U	10	U	10	U	10	U
76-01-7	Pentachloroethane	10	U	10	U	10	U	10	U
78-83-1	Isobutyl alcohol	200	U	200	U	200	U	200	U
126-99-8	Chloroprene	200	U	200	U	200	U	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:		µg/l	Qual.
CAS RN	Common name	Conc.	
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene chloride	4	BJ
67-64-1	Acetone	7	BJ
75-15-0	Carbon disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethylene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon tetrachloride	5	U
108-05-4	Vinyl acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U

*Blank values indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:		µg/l	
CAS RN	Common name	Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	5	U
110-75-8	2-Chloroethylvinylether	10	U
75-25-2	Bromoform	5	U
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
107-02-8	Acrolein	100	U
74-88-4	Iodomethane	10	U
107-13-1	Acrylonitrile	100	U
74-95-3	Dibromomethane	5	U
97-63-2	Ethyl Methacrylate	5	U
96-18-4	1,2,3-Trichloropropane	5	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U
75-05-8	Acetonitrile	100	U
107-05-1	3-Chloropropene	5	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:			
CAS RN	Common name	µg/l Conc.	Qual.
107-12-0	Propionitrile	100	U
126-98-7	Methacrylonitrile	5	U
123-91-1	1,4-Dioxane	200	U
80-62-6	Methyl methacrylate	10	U
106-93-4	1,2-Dibromoethane	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U
76-01-7	Pentachloroethane	10	U
78-83-1	Isobutyl alcohol	200	U
126-99-8	Chloroprene	200	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/09/92		02/10/92	
DATE SAMPLED:		20884		20884		20884		20866		20877	
LAB NUMBER:		20884		20884		20884		20866		20877	
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	10	U	10	U	10	U	10	U
108-95-2	Phenol	10	U	10	U	10	U	10	U	10	U
62-53-3	Aniline	10	U	10	U	10	U	10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	10	U	10	U	10	U	10	U
95-57-8	2-Chlorophenol	10	U	10	U	10	U	10	U	10	U
541-73-1	1,3-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
106-46-7	1,4-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
100-51-6	Benzyl alcohol	10	U	10	U	10	U	10	U	10	U
95-50-1	1,2-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
95-48-7	2-Methylphenol	10	U	10	U	10	U	10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	10	U	10	U	10	U	10	U
106-44-5	4-Methylphenol	10	U	10	U	10	U	10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	10	U	10	U	10	U	10	U
67-72-1	Hexachloroethane	10	U	10	U	10	U	10	U	10	U
98-95-3	Nitrobenzene	10	U	10	U	10	U	10	U	10	U
78-59-1	Isophorone	10	U	10	U	10	U	10	U	10	U
88-75-5	2-Nitrophenol	10	U	10	U	10	U	10	U	10	U
105-67-9	2,4-Dimethylphenol	10	U	10	U	10	U	10	U	10	U
65-75-0	Benzoic Acid	50	U	50	U	50	U	50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	10	U	10	U	10	U	10	U
120-83-2	2,4-Dichlorophenol	10	U	10	U	10	U	10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U	10	U
91-20-3	Naphthalene	10	U	10	U	10	U	10	U	10	U
106-47-8	4-Chloroaniline	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/09/92		02/10/92	
DATE SAMPLED:		20884		20884		20884		20866		20877	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
87-68-3	Hexachlorobutadiene	10	U	10	U	10	U	10	U	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U	10	U	10	U	10	U	10	U
91-57-6	2-Methylnaphthalene	10	U	10	U	10	U	10	U	10	U
77-47-4	Hexachlorocyclopentadiene	10	U	10	U	10	U	10	U	10	U
88-06-2	2,4,6-Trichlorophenol	10	U	10	U	10	U	10	U	10	U
95-95-4	2,4,5-Trichlorophenol	50	U	50	U	50	U	50	U	50	U
91-58-7	2-Chloronaphthalene	10	U	10	U	10	U	10	U	10	U
88-74-4	2-Nitroaniline	50	U	50	U	50	U	50	U	50	U
131-11-3	Dimethyl phthalate	10	U	10	U	10	U	10	U	10	U
208-96-8	Acenaphthylene	10	U	10	U	10	U	10	U	10	U
606-20-2	2,6-Dinitrotoluene	10	U	10	U	10	U	10	U	10	U
99-09-2	3-Nitroaniline	50	U	50	U	50	U	50	U	50	U
83-32-9	Acenaphthene	10	U	39	U	52	U	10	U	10	U
51-28-5	2,4-Dinitrophenol	50	U	50	U	50	U	50	U	50	U
100-02-7	4-Nitrophenol	50	U	50	U	50	U	50	U	50	U
132-64-9	Dibenzofuran	10	U	10	U	10	U	10	U	10	U
121-14-2	2,4-Dinitrotoluene	10	U	10	U	10	U	10	U	10	U
84-66-2	Diethyl phthalate	10	U	10	U	10	U	10	U	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U	10	U	10	U	10	U	10	U
86-73-7	Fluorene	10	U	3	J	4	J	10	U	10	U
100-10-6	4-Nitroaniline	50	U	50	U	50	U	50	U	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U	50	U	50	U	50	U	50	U
86-30-6	N-Nitrosodiphenylamine	10	U	10	U	10	U	10	U	10	U
122-66-7	1,2-Diphenylhydrazine	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

CAS RN	Common name	MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
UNITS:		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
101-55-3	4-Bromophenyl phenyl ether	10	U	10	U	10	U	10	U	10	U
118-74-1	Hexachlorobenzene	10	U	10	U	10	U	10	U	10	U
87-86-5	Pentachloropheno	50	U	50	U	50	U	50	U	50	U
85-01-8	Phenanthrene	10	U	10	U	10	U	10	U	10	U
120-12-7	Anthracene	10	U	10	U	10	U	10	U	10	U
84-74-2	Di-n-butyl phthalate	3	BJ	6	BJ	4	BJ	5	BJ	3	J
206-44-0	Fluoranthene	10	U	10	U	10	U	10	U	10	U
129-00-0	Pyrene	10	U	10	U	10	U	10	U	10	U
85-68-7	Butyl benzyl phthalate	10	U	10	U	10	U	10	U	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U	20	U	20	U	20	U	20	U
56-55-3	Benzo[<i>a</i>]anthracene	10	U	10	U	10	U	10	U	10	U
218-01-9	Chrysene	10	U	10	U	10	U	10	U	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	4	J	7	J	5	J	8	J	8	J
117-84-0	Di-n-octyl phthalate	10	U	10	U	10	U	10	U	10	U
205-99-2	Benzo[<i>b</i>]fluoranthene	10	U	10	U	10	U	10	U	10	U
207-08-9	Benzo[<i>k</i>]fluoranthene	10	U	10	U	10	U	10	U	10	U
50-32-8	Benzo[<i>a</i>]pyrene	10	U	10	U	10	U	10	U	10	U
193-39-5	Indeno(1,2,3- <i>cd</i>)pyrene	10	U	10	U	10	U	10	U	10	U
53-70-3	Dibenz[<i>a,h</i>]anthracene	10	U	10	U	10	U	10	U	10	U
191-24-2	Benzo[<i>ghi</i>]perylene	10	U	10	U	10	U	10	U	10	U
109-06-8	2-Picoline	50	U	50	U	50	U	50	U	50	U
66-27-3	Methyl methanesulfonate	10	U	10	U	10	U	10	U	10	U
62-50-0	Ethyl methanesulfonate	10	U	10	U	10	U	10	U	10	U
98-86-2	Acetophenone	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/09/92		02/10/92	
DATE SAMPLED:		20884		20884		20884		20866		20877	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
100-75-4	N-Nitrosopiperidine	10	U	10	U	10	U	10	U	10	U
122-09-8	Phenyl-tert-butylamine	50	U	50	U	50	U	50	U	50	U
87-65-0	2,6-Dichlorophenol	10	U	10	U	10	U	10	U	10	U
924-16-3	N-Nitrosodl-n-butylamine	10	U	10	U	10	U	10	U	10	U
55-18-5	N-Nitrosodiethylamine	10	U	10	U	10	U	10	U	10	U
930-55-2	N-Nitrosopyrrolidine	10	U	10	U	10	U	10	U	10	U
92-87-5	Benzidine	50	U	50	U	50	U	50	U	50	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U	50	U	50	U	50	U	50	U
608-93-5	Pentachlorobenzene	50	U	50	U	50	U	50	U	50	U
134-32-7	1-Naphthylamine	50	U	50	U	50	U	50	U	50	U
91-59-8	2-Naphthylamine	50	U	50	U	50	U	50	U	50	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U	10	U	10	U	10	U	10	U
122-39-4	Diphenylamine	10	U	10	U	10	U	10	U	10	U
62-44-2	Phenacetin	10	U	10	U	10	U	10	U	10	U
92-67-1	4-Aminobiphenyl	50	U	50	U	50	U	50	U	50	U
82-68-8	Pentachloronitrobenzene	50	U	50	U	50	U	50	U	50	U
23950-58-5	Pronamide	10	U	10	U	10	U	10	U	10	U
60-11-7	p-(Dimethylamino)azobenzene	10	U	10	U	10	U	10	U	10	U
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U	10	U	10	U	10	U	10	U
56-49-5	Methylolanthrene	10	U	10	U	10	U	10	U	10	U
110-86-1	Pyridine	50	U	50	U	50	U	50	U	50	U
10595-95-6	N-Nitrosomethylethylamine	10	U	10	U	10	U	10	U	10	U
59-89-2	N-Nitrosomorpholine	10	U	10	U	10	U	10	U	10	U
95-53-4	o-Toluidine	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/09/92		02/10/92	
DATE SAMPLED:		20884		20884		20884		20866		20877	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
108-39-4	3-Methylphenol	10	U	10	U	10	U	10	U	10	U
1888-71-7	Hexachloropropene	50	U	50	U	50	U	50	U	50	U
106-50-3	p-Phenylenediamine	50	U	50	U	50	U	50	U	50	U
94-59-7	Safrole	50	U	50	U	50	U	50	U	50	U
120-58-1	Isosafrole	50	U	50	U	50	U	50	U	50	U
130-15-4	1,4-Naphthoquinone	50	U	50	U	50	U	50	U	50	U
99-65-0	1,3-Dinitrobenzene	10	U	10	U	10	U	10	U	10	U
99-55-8	5-Nitro-o-toluidine	10	U	10	U	10	U	10	U	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U	10	U	10	U	10	U	10	U
56-57-5	4-Nitroquinoline 1-oxide	10	U	10	U	10	U	10	U	10	U
91-80-5	Methapyrene	50	U	50	U	50	U	50	U	50	U
119-93-7	3,3'-Dimethylbenzidine	10	U	10	U	10	U	10	U	10	U
53-96-3	2-Acetylaminofluorene	10	U	10	U	10	U	10	U	10	U
70-30-4	Hexachlorophene	50	U	50	U	50	U	50	U	50	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	10	U	10	U	10	U	10	U
108-95-2	Phenol	10	U	10	U	10	U	10	U	10	U
62-53-3	Aniline	10	U	10	U	10	U	10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	10	U	10	U	10	U	10	U
95-57-8	2-Chlorophenol	10	U	10	U	10	U	10	U	10	U
541-73-1	1,3-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
106-46-7	1,4-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
100-51-6	Benzyl alcohol	10	U	10	U	10	U	10	U	10	U
95-50-1	1,2-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
95-48-7	2-Methylphenol	10	U	10	U	10	U	10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	10	U	10	U	10	U	10	U
106-44-5	4-Methylphenol	10	U	10	U	10	U	10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	10	U	10	U	10	U	10	U
67-72-1	Hexachloroethane	10	U	10	U	10	U	10	U	10	U
98-95-3	Nitrobenzene	10	U	10	U	10	U	10	U	10	U
78-59-1	Isophorone	10	U	10	U	10	U	10	U	10	U
88-75-5	2-Nitrophenol	10	U	10	U	10	U	10	U	10	U
105-67-9	2,4-Dimethylphenol	10	U	10	U	10	U	10	U	10	U
65-75-0	Benzoic Acid	50	U	50	U	50	U	50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	10	U	10	U	10	U	10	U
120-83-2	2,4-Dichlorophenol	10	U	10	U	10	U	10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U	10	U
91-20-3	Naphthalene	10	U	10	U	10	U	10	U	10	U
106-47-8	4-Chloroaniline	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
87-68-3	Hexachlorobutadiene	10	U	10	U	10	U	10	U	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U	10	U	10	U	10	U	10	U
91-57-6	2-Methylnaphthalene	10	U	10	U	10	U	10	U	10	U
77-47-4	Hexachlorocyclopentadiene	10	U	10	U	10	U	10	U	10	U
88-06-2	2,4,6-Trichlorophenol	10	U	10	U	10	U	10	U	10	U
95-95-4	2,4,5-Trichlorophenol	50	U	50	U	50	U	50	U	50	U
91-58-7	2-Chloronaphthalene	10	U	10	U	10	U	10	U	10	U
88-74-4	2-Nitroaniline	50	U	50	U	50	U	50	U	50	U
131-11-3	Dimethyl phthalate	10	U	10	U	10	U	10	U	10	U
208-96-8	Acenaphthylene	10	U	10	U	10	U	10	U	10	U
606-20-2	2,6-Dinitrotoluene	10	U	10	U	10	U	10	U	10	U
99-09-2	3-Nitroaniline	50	U	50	U	50	U	50	U	50	U
83-32-9	Acenaphthene	10	U	10	U	10	U	10	U	10	U
51-28-5	2,4-Dinitrophenol	50	U	50	U	50	U	50	U	50	U
100-02-7	4-Nitrophenol	50	U	50	U	50	U	50	U	50	U
132-64-9	Dibenzofuran	10	U	10	U	10	U	10	U	10	U
121-14-2	2,4-Dinitrotoluene	10	U	10	U	10	U	10	U	10	U
84-66-2	Diethyl phthalate	10	U	10	U	10	U	10	U	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U	10	U	10	U	10	U	10	U
86-73-7	Fluorene	10	U	10	U	10	U	10	U	10	U
100-10-6	4-Nitroaniline	50	U	50	U	50	U	50	U	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U	50	U	50	U	50	U	50	U
86-30-6	N-Nitrosodiphenylamine	10	U	10	U	10	U	10	U	10	U
122-66-7	1,2-Diphenylhydrazine	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:		20877		20877		20884		20884		20884	
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether	10	U	10	U	10	U	10	U	10	U
118-74-1	Hexachlorobenzene	10	U	10	U	10	U	10	U	10	U
87-86-5	Pentachlorophenol	50	U	50	U	50	U	50	U	50	U
85-01-8	Phenanthrene	10	U	10	U	10	U	10	U	10	U
120-12-7	Anthracene	10	U	10	U	10	U	10	U	10	U
84-74-2	Di-n-butyl phthalate	2	BJ	10	U	3	J	10	U	3	BJ
206-44-0	Fluoranthene	10	U	10	U	10	U	10	U	10	U
129-00-0	Pyrene	10	U	10	U	10	U	10	U	10	U
85-68-7	Butyl benzyl phthalate	10	U	10	U	10	U	10	U	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U	10	U	10	U	10	U	10	U
56-55-3	Benzo[a]anthracene	20	U	20	U	20	U	20	U	20	U
218-01-9	Chrysene	10	U	10	U	10	U	10	U	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	2	BJ	10	U	17	J	10	U	6	J
117-84-0	Di-n-octyl phthalate	10	U	10	U	10	U	10	U	10	U
205-99-2	Benzo[b]fluoranthene	10	U	10	U	10	U	10	U	10	U
207-08-9	Benzo[k]fluoranthene	10	U	10	U	10	U	10	U	10	U
50-32-8	Benzo[a]pyrene	10	U	10	U	10	U	10	U	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	10	U	10	U	10	U	10	U
53-70-3	Dibenz[a,h]anthracene	10	U	10	U	10	U	10	U	10	U
191-24-2	Benzo[ghi]perylene	10	U	10	U	10	U	10	U	10	U
109-06-8	2-Picoline	50	U	50	U	50	U	50	U	50	U
66-27-3	Methyl methanesulfonate	10	U	10	U	10	U	10	U	10	U
62-50-0	Ethyl methanesulfonate	10	U	10	U	10	U	10	U	10	U
98-86-2	Acetophenone	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:		20877		20877		20884		20884		20884	
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
100-75-4	N-Nitrosopiperidine	10	U	10	U	10	U	10	U	10	U
122-09-8	Phenyl-tert-butylamine	50	U	50	U	50	U	50	U	50	U
87-65-0	2,6-Dichlorophenol	10	U	10	U	10	U	10	U	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U	10	U	10	U	10	U	10	U
55-18-5	N-Nitrosodiethylamine	10	U	10	U	10	U	10	U	10	U
930-55-2	N-Nitrosopyrrolidine	10	U	10	U	10	U	10	U	10	U
92-87-5	Benzidine	50	U	50	U	50	U	50	U	50	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U	50	U	50	U	50	U	50	U
608-93-5	Pentachlorobenzene	50	U	50	U	50	U	50	U	50	U
134-32-7	1-Naphthylamine	50	U	50	U	50	U	50	U	50	U
91-59-8	2-Naphthylamine	50	U	50	U	50	U	50	U	50	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U	10	U	10	U	10	U	10	U
122-39-4	Diphenylamine	10	U	10	U	10	U	10	U	10	U
62-44-2	Phenacetin	10	U	10	U	10	U	10	U	10	U
92-67-1	4-Aminobiphenyl	50	U	50	U	50	U	50	U	50	U
82-68-8	Pentachloronitrobenzene	50	U	50	U	50	U	50	U	50	U
23950-58-5	Pronamide	10	U	10	U	10	U	10	U	10	U
60-11-7	p-(Dimethylamino)azobenzene	10	U	10	U	10	U	10	U	10	U
57-97-6	7,12-Dimethylbenzo[<i>a</i>]anthracene	10	U	10	U	10	U	10	U	10	U
56-49-5	Methylcholanthrene	10	U	10	U	10	U	10	U	10	U
110-86-1	Pyridine	50	U	50	U	50	U	50	U	50	U
10595-95-6	N-Nitrosomethylethylamine	10	U	10	U	10	U	10	U	10	U
59-89-2	N-Nitrosomorpholine	10	U	10	U	10	U	10	U	10	U
95-53-4	o-Toluidine	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMI-VOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
108-39-4	3-Methylphenol	10	U	10	U	10	U	10	U	10	U
1888-71-7	Hexachloropropene	50	U	50	U	50	U	50	U	50	U
106-50-3	p-Phenylenediamine	50	U	50	U	50	U	50	U	50	U
94-59-7	Saifrole	50	U	50	U	50	U	50	U	50	U
120-58-1	Isosafrole	50	U	50	U	50	U	50	U	50	U
130-15-4	1,4-Naphthoquinone	50	U	50	U	50	U	50	U	50	U
99-65-0	1,3-Dinitrobenzene	10	U	10	U	10	U	10	U	10	U
99-55-8	5-Nitro-o-toluidine	10	U	10	U	10	U	10	U	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U	10	U	10	U	10	U	10	U
56-57-5	4-Nitroquinoline 1-oxide	10	U	10	U	10	U	10	U	10	U
91-80-5	Methapyrilene	50	U	50	U	50	U	50	U	50	U
119-93-7	3,3'-Dimethylbenzidine	10	U	10	U	10	U	10	U	10	U
53-96-3	2-Acetylaminofluorene	10	U	10	U	10	U	10	U	10	U
70-30-4	Hexachlorophene	50	U	50	U	50	U	50	U	50	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:		µg/l	
CAS RN	Common name	Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
62-53-3	Aniline	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	13	U
65-75-0	Benzoic Acid	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:		µg/l	Qual.
CAS RN	Common name	Conc.	
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethyl phthalate	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:		µg/l	Qual.
CAS RN	Common name	Conc.	
101-55-3	4-Bromophenyl phenyl ether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-butyl phthalate	3	BJ
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butyl benzyl phthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo[a]anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	4	BJ
117-84-0	Di-n-octyl phthalate	10	U
205-99-2	Benzo[b]fluoranthene	10	U
207-08-9	Benzo[k]fluoranthene	10	U
50-32-8	Benzo[a]pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz[a,h]anthracene	10	U
191-24-2	Benzo[ghi]perylene	10	U
109-06-8	2-Picoline	50	U
66-27-3	Methyl methanesulfonate	10	U
62-50-0	Ethyl methanesulfonate	10	U
98-86-2	Acetophenone	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:			
CAS RN	Common name	µg/l Conc.	Qual.
100-75-4	N-Nitrosopiperidine	10	U
122-09-8	Phenyl-tert-butylamine	50	U
87-65-0	2,6-Dichlorophenol	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U
55-18-5	N-Nitrosodiethylamine	10	U
930-55-2	N-Nitrosopyrrolidine	10	U
92-87-5	Benzidine	50	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U
608-93-5	Pentachlorobenzene	50	U
134-32-7	1-Naphthylamine	50	U
91-59-8	2-Naphthylamine	50	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U
122-39-4	Diphenylamine	10	U
62-44-2	Phenacetin	10	U
92-67-1	4-Aminobiphenyl	50	U
82-68-8	Pentachloronitrobenzene	50	U
23950-58-5	Pronamide	10	U
60-11-7	p-(Dimethylamino)azobenzene	10	U
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U
56-49-5	Methylcholanthrene	10	U
110-86-1	Pyridine	50	U
10595-95-6	N-Nitrosomethylethylamine	10	U
59-89-2	N-Nitrosomorpholine	10	U
95-53-4	o-Toluidine	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:			
CAS RN	Common name	µg/l	Qual.
108-39-4	3-Methylphenol	10	U
1888-71-7	Hexachloropropene	50	U
106-50-3	p-Phenylenediamine	50	U
94-59-7	Saifrole	50	U
120-58-1	Isosafrole	50	U
130-15-4	1,4-Naphthoquinone	50	U
99-65-0	1,3-Dinitrobenzene	10	U
99-55-8	5-Nitro-o-toluidine	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U
56-57-5	4-Nitroquinoline 1-oxide	10	U
91-80-5	Methapyrilene	50	U
119-93-7	3,3'-Dimethylbenzidine	10	U
53-96-3	2-Acetylaminofluorene	10	U
70-30-4	Hexachlorophene	50	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/09/92		02/09/92		02/10/92		02/05/92		02/05/92	
DATE SAMPLED:		20866		20866		20877		20837		20837	
LAB NUMBER:		20866		20866		20877		20837		20837	
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	10	U	10	U	10	U	10	U
108-95-2	Phenol	10	U	10	U	10	U	10	U	10	U
62-53-3	Aniline	10	U	10	U	10	U	10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	10	U	10	U	10	U	10	U
95-57-8	2-Chlorophenol	10	U	10	U	10	U	10	U	10	U
541-73-1	1,3-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
106-46-7	1,4-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
100-51-6	Benzyl alcohol	10	U	10	U	10	U	10	U	10	U
95-50-1	1,2-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
95-48-7	2-Methylphenol	10	U	10	U	10	U	10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	10	U	10	U	10	U	10	U
106-44-5	4-Methylphenol	10	U	10	U	10	U	10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	10	U	10	U	10	U	10	U
67-72-1	Hexachloroethane	10	U	10	U	10	U	10	U	10	U
98-95-3	Nitrobenzene	10	U	10	U	10	U	10	U	10	U
78-59-1	Isophorone	10	U	10	U	10	U	10	U	10	U
88-75-5	2-Nitrophenol	10	U	10	U	10	U	10	U	10	U
105-67-9	2,4-Dimethylphenol	10	U	10	U	10	U	10	U	10	U
65-75-0	Benzoic Acid	50	U	50	U	50	U	50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	10	U	10	U	10	U	10	U
120-83-2	2,4-Dichlorophenol	10	U	10	U	10	U	10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U	10	U
91-20-3	Naphthalene	10	U	10	U	10	U	10	U	10	U
106-47-8	4-Chloroaniline	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A: \MPTDAT5.WK1		MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/09/92		02/09/92		02/10/92		02/05/92		02/05/92	
DATE SAMPLED:		20866		20866		20877		20837		20837	
LAB NUMBER:		20866		20866		20877		20837		20837	
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
87-68-3	Hexachlorobutadiene	10	U	10	U	10	U	10	U	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U	10	U	10	U	10	U	10	U
91-57-6	2-Methylnaphthalene	10	U	10	U	10	U	10	U	10	U
77-47-4	Hexachlorocyclopentadiene	10	U	10	U	10	U	10	U	10	U
88-06-2	2,4,6-Trichlorophenol	10	U	10	U	10	U	10	U	10	U
95-95-4	2,4,5-Trichlorophenol	50	U	50	U	50	U	50	U	50	U
91-58-7	2-Chloronaphthalene	10	U	10	U	10	U	10	U	10	U
88-74-4	2-Nitroaniline	50	U	50	U	50	U	50	U	50	U
131-11-3	Dimethyl phthalate	10	U	10	U	10	U	10	U	10	U
208-96-8	Acenaphthylene	10	U	10	U	10	U	10	U	10	U
606-20-2	2,6-Dinitrotoluene	10	U	10	U	10	U	10	U	10	U
99-09-2	3-Nitroaniline	50	U	50	U	50	U	50	U	50	U
83-32-9	Acenaphthene	10	U	10	U	10	U	10	U	10	U
51-28-5	2,4-Dinitrophenol	50	U	50	U	50	U	50	U	50	U
100-02-7	4-Nitrophenol	50	U	50	U	50	U	50	U	50	U
132-64-9	Dibenzofuran	10	U	10	U	10	U	10	U	10	U
121-14-2	2,4-Dinitrotoluene	10	U	10	U	10	U	10	U	10	U
84-66-2	Diethyl phthalate	10	U	10	U	10	U	10	U	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U	10	U	10	U	10	U	10	U
86-73-7	Fluorene	10	U	10	U	10	U	10	U	10	U
100-10-6	4-Nitroaniline	50	U	50	U	50	U	50	U	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U	50	U	50	U	50	U	50	U
86-30-6	N-Nitrosodiphenylamine	10	U	10	U	10	U	10	U	10	U
122-66-7	1,2-Diphenylhydrazine	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/09/92		02/09/92		02/10/92		02/05/92		02/05/92	
DATE SAMPLED:		20866		20866		20877		20837		20837	
LAB NUMBER:		20866		20866		20877		20837		20837	
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
101-55-3	4-Bromophenyl phenyl ether	10	U	10	U	10	U	10	U	10	U
118-74-1	Hexachlorobenzene	10	U	10	U	10	U	10	U	10	U
87-86-5	Pentachlorophenol	50	U	50	U	50	U	50	U	50	U
85-01-8	Phenanthrene	10	U	10	U	10	U	10	U	10	U
120-12-7	Anthracene	10	U	10	U	10	U	10	U	10	U
84-74-2	Di-n-butyl phthalate	2	BJ	6	BJ	10	U	6	BJ	3	BJ
206-44-0	Fluoranthene	10	U	10	U	10	U	10	U	10	U
129-00-0	Pyrene	10	U	10	U	10	U	10	U	10	U
85-68-7	Butyl benzyl phthalate	10	U	10	U	10	U	10	U	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U	20	U	20	U	20	U	20	U
56-55-3	Benzo[a]anthracene	10	U	10	U	10	U	10	U	10	U
218-01-9	Chrysene	10	U	10	U	10	U	10	U	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	6	J	10	U	3	BJ	10	U	10	U
117-84-0	Di-n-octyl phthalate	10	U	10	U	10	U	10	U	10	U
205-99-2	Benzo[b]fluoranthene	10	U	10	U	10	U	10	U	10	U
207-08-9	Benzo[k]fluoranthene	10	U	10	U	10	U	10	U	10	U
50-32-8	Benzo[a]pyrene	10	U	10	U	10	U	10	U	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	10	U	10	U	10	U	10	U
53-70-3	Dibenz[a,h]anthracene	10	U	10	U	10	U	10	U	10	U
191-24-2	Benzo[ghi]perylene	10	U	10	U	10	U	10	U	10	U
109-06-8	2-Picoline	50	U	50	U	50	U	50	U	50	U
66-27-3	Methyl methanesulfonate	10	U	10	U	10	U	10	U	10	U
62-50-0	Ethyl methanesulfonate	10	U	10	U	10	U	10	U	10	U
98-86-2	Acetophenone	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/09/92		02/09/92		02/10/92		02/05/92		02/05/92	
DATE SAMPLED:		20866		20866		20877		20837		20837	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
100-75-4	N-Nitrosopiperidine	10	U	10	U	10	U	10	U	10	U
122-09-8	Phenyl-tert-butylamine	50	U	50	U	50	U	50	U	50	U
87-65-0	2,6-Dichlorophenol	10	U	10	U	10	U	10	U	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U	10	U	10	U	10	U	10	U
55-18-5	N-Nitrosodiethylamine	10	U	10	U	10	U	10	U	10	U
930-55-2	N-Nitrosopyrrolidine	10	U	10	U	10	U	10	U	10	U
92-87-5	Benzidine	50	U	50	U	50	U	50	U	50	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U	50	U	50	U	50	U	50	U
608-93-5	Pentachlorobenzene	50	U	50	U	50	U	50	U	50	U
134-32-7	1-Naphthylamine	50	U	50	U	50	U	50	U	50	U
91-59-8	2-Naphthylamine	50	U	50	U	50	U	50	U	50	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U	10	U	10	U	10	U	10	U
122-39-4	Diphenylamine	10	U	10	U	10	U	10	U	10	U
62-44-2	Phenacetin	10	U	10	U	10	U	10	U	10	U
92-67-1	4-Aminobiphenyl	50	U	50	U	50	U	50	U	50	U
82-68-8	Pentachloronitrobenzene	50	U	50	U	50	U	50	U	50	U
23950-58-5	Pronamide	10	U	10	U	10	U	10	U	10	U
60-11-7	p-(Dimethylamino)azobenzene	10	U	10	U	10	U	10	U	10	U
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U	10	U	10	U	10	U	10	U
56-49-5	Methylcholanthrene	10	U	10	U	10	U	10	U	10	U
110-86-1	Pyridine	50	U	50	U	50	U	50	U	50	U
10595-95-6	N-Nitrosomethylethylamine	10	U	10	U	10	U	10	U	10	U
59-89-2	N-Nitrosomorpholine	10	U	10	U	10	U	10	U	10	U
95-53-4	o-Toluidine	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW9S-1	MPT-2-MW9D-1	MPT-2-MW10-1	MPT-2-MW11-1	MPT-2-MW12S-1
LOCATION:		WATER	WATER	WATER	WATER	WATER
SAMPLE MATRIX:		02/09/92	02/09/92	02/10/92	02/05/92	02/05/92
DATE SAMPLED:		20866	20866	20877	20837	20837
LAB NUMBER:		20866	20866	20877	20837	20837
CAS RN	Common name	µg/l	µg/l	µg/l	µg/l	µg/l
		Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
108-39-4	3-Methylphenol	10	10	10	10	10
1888-71-7	Hexachloropropene	50	50	50	50	50
106-50-3	p-Phenylenediamine	50	50	50	50	50
94-59-7	Safrrole	50	50	50	50	50
120-58-1	Isosafrole	50	50	50	50	50
130-15-4	1,4-Naphthoquinone	50	50	50	50	50
99-65-0	1,3-Dinitrobenzene	10	10	10	10	10
99-55-8	5-Nitro-o-toluidine	10	10	10	10	10
99-35-4	1,3,5-Trinitrobenzene	10	10	10	10	10
56-57-5	4-Nitroquinoline 1-oxide	10	10	10	10	10
91-80-5	Methapyrilene	50	50	50	50	50
119-93-7	3,3'-Dimethylbenzidine	10	10	10	10	10
53-96-3	2-Acetylaminofluorene	10	10	10	10	10
70-30-4	Hexachlorophene	50	50	50	50	50

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92		02/10/92	
DATE SAMPLED:		20837		20902		20877		20877		20877	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	10	U	10	U	10	U	10	U
108-95-2	Phenol	10	U	10	U	10	U	10	U	10	U
62-53-3	Aniline	10	U	10	U	10	U	10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	10	U	10	U	10	U	10	U
95-57-8	2-Chlorophenol	10	U	10	U	10	U	10	U	10	U
541-73-1	1,3-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
106-46-7	1,4-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
100-51-6	Benzyl alcohol	10	U	10	U	10	U	10	U	10	U
95-50-1	1,2-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U
95-48-7	2-Methylphenol	10	U	10	U	10	U	10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	10	U	10	U	10	U	10	U
106-44-5	4-Methylphenol	10	U	10	U	10	U	10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	10	U	10	U	10	U	10	U
67-72-1	Hexachloroethane	10	U	10	U	10	U	10	U	10	U
98-95-3	Nitrobenzene	10	U	10	U	10	U	10	U	10	U
78-59-1	Isophorone	10	U	10	U	10	U	10	U	10	U
88-75-5	2-Nitrophenol	10	U	10	U	10	U	10	U	10	U
105-67-9	2,4-Dimethylphenol	10	U	10	U	10	U	10	U	10	U
65-75-0	Benzoic Acid	50	U	50	U	50	U	50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	10	U	10	U	10	U	10	U
120-83-2	2,4-Dichlorophenol	10	U	10	U	10	U	10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U	10	U
91-20-3	Naphthalene	10	U	10	U	10	U	10	U	10	U
106-47-8	4-Chloroaniline	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92		02/10/92	
DATE SAMPLED:		20837		20902		20877		20877		20877	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
87-68-3	Hexachlorobutadiene	10	U	10	U	10	U	10	U	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U	10	U	10	U	10	U	10	U
91-57-6	2-Methylnaphthalene	10	U	10	U	10	U	10	U	10	U
77-47-4	Hexachlorocyclopentadiene	10	U	10	U	10	U	10	U	10	U
88-06-2	2,4,6-Trichlorophenol	10	U	10	U	10	U	10	U	10	U
95-95-4	2,4,5-Trichlorophenol	50	U	50	U	50	U	50	U	50	U
91-58-7	2-Chloronaphthalene	10	U	10	U	10	U	10	U	10	U
88-74-4	2-Nitroaniline	50	U	50	U	50	U	50	U	50	U
131-11-3	Dimethyl phthalate	10	U	10	U	10	U	10	U	10	U
208-96-8	Acenaphthylene	10	U	10	U	10	U	10	U	10	U
606-20-2	2,6-Dinitrotoluene	10	U	10	U	10	U	10	U	10	U
99-09-2	3-Nitroaniline	50	U	50	U	50	U	50	U	50	U
83-32-9	Acenaphthene	10	U	10	U	10	U	10	U	10	U
51-28-5	2,4-Dinitrophenol	50	U	50	U	50	U	50	U	50	U
100-02-7	4-Nitrophenol	50	U	50	U	50	U	50	U	50	U
132-64-9	Dibenzofuran	10	U	10	U	10	U	10	U	10	U
121-14-2	2,4-Dinitrotoluene	10	U	10	U	10	U	10	U	10	U
84-66-2	Diethyl phthalate	10	U	10	U	10	U	10	U	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U	10	U	10	U	10	U	10	U
86-73-7	Fluorene	10	U	10	U	10	U	10	U	10	U
100-10-6	4-Nitroaniline	50	U	50	U	50	U	50	U	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U	50	U	50	U	50	U	50	U
86-30-6	N-Nitrosodiphenylamine	10	U	10	U	10	U	10	U	10	U
122-66-7	1,2-Diphenylhydrazine	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92		02/10/92	
DATE SAMPLED:		20837		20902		20877		20877		20877	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.
101-55-3	4-Bromophenyl phenyl ether	10	U	10	U	10	U	10	U	10	U
118-74-1	Hexachlorobenzene	10	U	10	U	10	U	10	U	10	U
87-86-5	Pentachlorophenol	50	U	50	U	50	U	50	U	50	U
85-01-8	Phenanthrene	10	U	10	U	10	U	10	U	10	U
120-12-7	Anthracene	10	U	10	U	10	U	10	U	10	U
84-74-2	Di-n-butyl phthalate	6	BJ	3	BJ	10	U	10	U	10	U
206-44-0	Fluoranthene	10	U	10	U	10	U	10	U	10	U
129-00-0	Pyrene	10	U	10	U	10	U	10	U	10	U
85-68-7	Butyl benzyl phthalate	10	U	10	U	10	U	10	U	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U	10	U	10	U	10	U	10	U
56-55-3	Benzo[a]anthracene	20	U	20	U	20	U	20	U	20	U
218-01-9	Chrysene	10	U	10	U	10	U	10	U	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	2	BJ	4	J	10	U	10	U	10	U
117-84-0	Di-n-octyl phthalate	10	U	10	U	10	U	10	U	10	U
205-99-2	Benzo[b]fluoranthene	10	U	10	U	10	U	10	U	10	U
207-08-9	Benzo[k]fluoranthene	10	U	10	U	10	U	10	U	10	U
50-32-8	Benzo[a]pyrene	10	U	10	U	10	U	10	U	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	10	U	10	U	10	U	10	U
53-70-3	Dibenz[a,h]anthracene	10	U	10	U	10	U	10	U	10	U
191-24-2	Benzo[ghi]perylene	10	U	10	U	10	U	10	U	10	U
109-06-8	2-Picoline	50	U	50	U	50	U	50	U	50	U
66-27-3	Methyl methanesulfonate	10	U	10	U	10	U	10	U	10	U
62-50-0	Ethyl methanesulfonate	10	U	10	U	10	U	10	U	10	U
98-86-2	Acetophenone	10	U	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\IMPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R			
LOCATION:		WATER		WATER		WATER		WATER		WATER			
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92		02/10/92			
DATE SAMPLED:		20837		20902		20877		20877		20877			
LAB NUMBER:													
CAS RN	Common name	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.
100-75-4	N-Nitrosopiperidine	10	U	U	10	U	U	10	U	U	10	U	U
122-09-8	Phenyl-tert-butylamine	50	U	U	50	U	U	50	U	U	50	U	U
87-65-0	2,6-Dichlorophenol	10	U	U	10	U	U	10	U	U	10	U	U
924-16-3	N-Nitrosodi-n-butylamine	10	U	U	10	U	U	10	U	U	10	U	U
55-18-5	N-Nitrosodiethylamine	10	U	U	10	U	U	10	U	U	10	U	U
930-55-2	N-Nitrosopyrrolidine	10	U	U	10	U	U	10	U	U	10	U	U
92-87-5	Benzidine	50	U	U	50	U	U	50	U	U	50	U	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U	U	50	U	U	50	U	U	50	U	U
608-93-5	Pentachlorobenzene	50	U	U	50	U	U	50	U	U	50	U	U
134-32-7	1-Naphthylamine	50	U	U	50	U	U	50	U	U	50	U	U
91-59-8	2-Naphthylamine	50	U	U	50	U	U	50	U	U	50	U	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U	U	10	U	U	10	U	U	10	U	U
122-39-4	Diphenylamine	10	U	U	10	U	U	10	U	U	10	U	U
62-44-2	Phenacetin	10	U	U	10	U	U	10	U	U	10	U	U
92-67-1	4-Aminobiphenyl	50	U	U	50	U	U	50	U	U	50	U	U
82-68-8	Pentachloronitrobenzene	50	U	U	50	U	U	50	U	U	50	U	U
23950-58-5	Pronamide	10	U	U	10	U	U	10	U	U	10	U	U
60-11-7	p-(Dimethylamino)azobenzene	10	U	U	10	U	U	10	U	U	10	U	U
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U	U	10	U	U	10	U	U	10	U	U
56-49-5	Methylcholanthrene	10	U	U	10	U	U	10	U	U	10	U	U
110-86-1	Pyridine	50	U	U	50	U	U	50	U	U	50	U	U
10595-95-6	N-Nitrosomethylethylamine	10	U	U	10	U	U	10	U	U	10	U	U
59-89-2	N-Nitrosomorpholine	10	U	U	10	U	U	10	U	U	10	U	U
95-53-4	o-Toluidine	10	U	U	10	U	U	10	U	U	10	U	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

CAS RN	Common name	MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R	
		Conc. µg/l	Qual.	Conc. µg/l	Qual.	Conc. µg/l	Qual.	Conc. µg/l	Qual.	Conc. µg/l	Qual.
108-39-4	3-Methylphenol	10	U	10	U	10	U	10	U	10	U
1888-71-7	Hexachloropropene	50	U	50	U	50	U	50	U	50	U
106-50-3	p-Phenylenediamine	50	U	50	U	50	U	50	U	50	U
94-59-7	Safrole	50	U	50	U	50	U	50	U	50	U
120-58-1	Isosafrole	50	U	50	U	50	U	50	U	50	U
130-15-4	1,4-Naphthoquinone	50	U	50	U	50	U	50	U	50	U
99-65-0	1,3-Dinitrobenzene	10	U	10	U	10	U	10	U	10	U
99-55-8	5-Nitro-o-toluidine	10	U	10	U	10	U	10	U	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U	10	U	10	U	10	U	10	U
56-57-5	4-Nitroquinoline 1-oxide	10	U	10	U	10	U	10	U	10	U
91-80-5	Methapyrilene	50	U	50	U	50	U	50	U	50	U
119-93-7	3,3'-Dimethylbenzidine	10	U	10	U	10	U	10	U	10	U
53-96-3	2-Acetylaminofluorene	10	U	10	U	10	U	10	U	10	U
70-30-4	Hexachlorophene	50	U	50	U	50	U	50	U	50	U

A:\MPTDAT5.WK1
 LOCATION: MPT-2-MW15D-1 MPT-2-MW15D-1 MPT-2-MW15D-1R
 SAMPLE MATRIX: WATER WATER WATER
 DATE SAMPLED: 02/05/92 02/12/92 02/10/92
 LAB NUMBER: 20837 20902 20877 20877 20877

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92		02/12/92	
DATE SAMPLED:		20877		20931		20902		20902	
LAB NUMBER:									
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	10	U	10	U	10	U
108-95-2	Phenol	10	U	10	U	10	U	10	U
62-53-3	Aniline	10	U	10	U	10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	10	U	10	U	10	U
95-57-8	2-Chlorophenol	10	U	10	U	10	U	10	U
541-73-1	1,3-Dichlorobenzene	10	U	10	U	10	U	10	U
106-46-7	1,4-Dichlorobenzene	10	U	10	U	10	U	10	U
100-51-6	Benzyl alcohol	10	U	10	U	10	U	10	U
95-50-1	1,2-Dichlorobenzene	10	U	10	U	10	U	10	U
95-48-7	2-Methylphenol	10	U	10	U	10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	10	U	10	U	10	U
106-44-5	4-Methylphenol	10	U	10	U	10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	10	U	10	U	10	U
67-72-1	Hexachloroethane	10	U	10	U	10	U	10	U
98-95-3	Nitrobenzene	10	U	10	U	10	U	10	U
78-59-1	Isophorone	10	U	10	U	10	U	10	U
88-75-5	2-Nitrophenol	10	U	10	U	10	U	10	U
105-67-9	2,4-Dimethylphenol	10	U	10	U	10	U	10	U
65-75-0	Benzoic Acid	50	U	50	U	50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	10	U	10	U	10	U
120-83-2	2,4-Dichlorophenol	10	U	10	U	10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U
91-20-3	Naphthalene	10	U	10	U	10	U	10	U
106-47-8	4-Chloroaniline	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1		
LOCATION:		WATER		WATER		WATER		WATER		
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92		02/12/92		
DATE SAMPLED:		20877		20931		20902		20902		
LAB NUMBER:										
CAS RN	Common name	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.
87-68-3	Hexachlorobutadiene	10	U	10	U	10	U	10	U	
59-50-7	4-Chloro-3-Methylphenol	10	U	10	U	10	U	10	U	
91-57-6	2-Methylnaphthalene	10	U	10	U	10	U	10	U	
77-47-4	Hexachlorocyclopentadiene	10	U	10	U	10	U	10	U	
88-06-2	2,4,6-Trichlorophenol	10	U	10	U	10	U	10	U	
95-95-4	2,4,5-Trichlorophenol	50	U	50	U	50	U	50	U	
91-58-7	2-Chloronaphthalene	10	U	10	U	10	U	10	U	
88-74-4	2-Nitroaniline	50	U	50	U	50	U	50	U	
131-11-3	Dimethyl phthalate	10	U	10	U	10	U	10	U	
208-96-8	Acenaphthylene	10	U	10	U	10	U	10	U	
606-20-2	2,6-Dinitrotoluene	10	U	10	U	10	U	10	U	
99-09-2	3-Nitroaniline	50	U	50	U	50	U	50	U	
83-32-9	Acenaphthene	10	U	10	U	10	U	10	U	
51-28-5	2,4-Dinitrophenol	50	U	50	U	50	U	50	U	
100-02-7	4-Nitrophenol	50	U	50	U	50	U	50	U	
132-64-9	Dibenzofuran	10	U	10	U	10	U	10	U	
121-14-2	2,4-Dinitrotoluene	10	U	10	U	10	U	10	U	
84-66-2	Diethyl phthalate	10	U	10	U	10	U	10	U	
7005-72-3	4-Chlorophenyl phenyl ether	10	U	10	U	10	U	10	U	
86-73-7	Fluorene	10	U	10	U	10	U	10	U	
100-10-6	4-Nitroaniline	50	U	50	U	50	U	50	U	
534-52-1	4,6-Dinitro-2-Methylphenol	50	U	50	U	50	U	50	U	
86-30-6	N-Nitrosodiphenylamine	10	U	10	U	10	U	10	U	
122-66-7	1,2-Diphenylhydrazine	10	U	10	U	10	U	10	U	

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92		02/12/92	
DATE SAMPLED:		20877		20931		20902		20902	
LAB NUMBER:									
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
101-55-3	4-Bromophenyl phenyl ether	10	U	10	U	10	U	10	U
118-74-1	Hexachlorobenzene	10	U	10	U	10	U	10	U
87-86-5	Pentachlorophenol	50	U	50	U	50	U	50	U
85-01-8	Phenanthrene	10	U	10	U	10	U	10	U
120-12-7	Anthracene	10	U	10	U	10	U	10	U
84-74-2	Di-n-butyl phthalate	10	U	2	BJ	2	BJ	2	BJ
206-44-0	Fluoranthene	10	U	10	U	10	U	10	U
129-00-0	Pyrene	10	U	10	U	10	U	10	U
85-68-7	Butyl benzyl phthalate	10	U	10	U	10	U	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U	20	U	20	U	20	U
56-55-3	Benzo[a]anthracene	10	U	10	U	10	U	10	U
218-01-9	Chrysene	10	U	10	U	10	U	10	U
117-81-7	Bis(2-ethylhexyl) phthalate	10	U	2	J	2	J	2	J
117-84-0	Di-n-octyl phthalate	10	U	10	U	10	U	10	U
205-99-2	Benzo[b]fluoranthene	10	U	10	U	10	U	10	U
207-08-9	Benzo[k]fluoranthene	10	U	10	U	10	U	10	U
50-32-8	Benzo[a]pyrene	10	U	10	U	10	U	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	10	U	10	U	10	U
53-70-3	Dibenz[a,h]anthracene	10	U	10	U	10	U	10	U
191-24-2	Benzo[ghi]perylene	10	U	10	U	10	U	10	U
108-06-8	2-Picoline	50	U	50	U	50	U	50	U
66-27-3	Methyl methanesulfonate	10	U	10	U	10	U	10	U
62-50-0	Ethyl methanesulfonate	10	U	10	U	10	U	10	U
98-86-2	Acetophenone	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92		02/12/92	
DATE SAMPLED:		20877		20931		20902		20902	
LAB NUMBER:									
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
100-75-4	N-Nitrosopiperidine	10	U	10	U	10	U	10	U
122-09-8	Phenyl-tert-butylamine	50	U	50	U	50	U	50	U
87-65-0	2,6-Dichlorophenol	10	U	10	U	10	U	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U	10	U	10	U	10	U
55-18-5	N-Nitrosodiethylamine	10	U	10	U	10	U	10	U
930-55-2	N-Nitrosopyrrolidine	10	U	10	U	10	U	10	U
92-87-5	Benzidine	50	U	50	U	50	U	50	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U	50	U	50	U	50	U
608-93-5	Pentachlorobenzene	50	U	50	U	50	U	50	U
134-32-7	1-Naphthylamine	50	U	50	U	50	U	50	U
91-59-8	2-Naphthylamine	50	U	50	U	50	U	50	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U	10	U	10	U	10	U
122-39-4	Diphenylamine	10	U	10	U	10	U	10	U
62-44-2	Phenacetin	10	U	10	U	10	U	10	U
92-67-1	4-Aminobiphenyl	50	U	50	U	50	U	50	U
82-68-8	Pentachloronitrobenzene	50	U	50	U	50	U	50	U
23950-58-5	Pronamide	10	U	10	U	10	U	10	U
60-11-7	p-(Dimethylamino)azobenzene	10	U	10	U	10	U	10	U
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U	10	U	10	U	10	U
56-49-5	Methylcholanthrene	10	U	10	U	10	U	10	U
110-86-1	Pyridine	50	U	50	U	50	U	50	U
10595-95-6	N-Nitrosomethylethylamine	10	U	10	U	10	U	10	U
59-89-2	N-Nitrosomorpholine	10	U	10	U	10	U	10	U
95-53-4	o-Toluidine	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1		
LOCATION:		WATER		WATER		WATER		WATER		
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92				
DATE SAMPLED:		20877		20931		20902				
LAB NUMBER:										
CAS RN	Common name	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.
108-39-4	3-Methylphenol	10	U	10	U	10	U			
1888-71-7	Hexachloropropene	50	U	50	U	50	U			
106-50-3	p-Phenylenediamine	50	U	50	U	50	U			
94-59-7	Safrole	50	U	50	U	50	U			
120-58-1	Isosafrole	50	U	50	U	50	U			
130-15-4	1,4-Naphthoquinone	50	U	50	U	50	U			
99-65-0	1,3-Dinitrobenzene	10	U	10	U	10	U			
99-55-8	5-Nitro-o-toluidine	10	U	10	U	10	U			
99-35-4	1,3,5-Trinitrobenzene	10	U	10	U	10	U			
56-57-5	4-Nitroquinoline 1-oxide	10	U	10	U	10	U			
91-80-5	Methapyrilene	50	U	50	U	50	U			
119-93-7	3,3'-Dimethylbenzidine	10	U	10	U	10	U			
53-96-3	2-Acetylaminofluorene	10	U	10	U	10	U			
70-30-4	Hexachlorophene	50	U	50	U	50	U			

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.								
62-75-9	N-Nitrosodimethylamine	10	U								
108-95-2	Phenol	10	U								
62-53-3	Aniline	10	U								
111-44-4	bis(2-Chloroethyl)Ether	10	U								
95-57-8	2-Chlorophenol	10	U								
541-73-1	1,3-Dichlorobenzene	10	U								
106-46-7	1,4-Dichlorobenzene	10	U								
100-51-6	Benzyl alcohol	10	U								
95-50-1	1,2-Dichlorobenzene	10	U								
95-48-7	2-Methylphenol	10	U								
39638-32-9	bis(2-chloroethyl)Ether	10	U								
106-44-5	4-Methylphenol	10	U								
621-64-7	N-Nitroso-Di-n-Propylamine	10	U								
67-72-1	Hexachloroethane	10	U								
98-95-3	Nitrobenzene	10	U								
78-59-1	Isophorone	10	U								
88-75-5	2-Nitrophenol	10	U								
105-67-9	2,4-Dimethylphenol	10	U								
65-75-0	Benzoic Acid	50	U								
111-91-1	Bis(2-chloroethoxy)methane	10	U								
120-83-2	2,4-Dichlorophenol	10	U								
120-82-1	1,2,4-Trichlorobenzene	10	U								
91-20-3	Naphthalene	10	U								
106-47-8	4-Chloroaniline	10	U								

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.								
87-68-3	Hexachlorobutadiene	10	U								
59-50-7	4-Chloro-3-Methylphenol	10	U								
91-57-6	2-Methylnaphthalene	10	U								
77-47-4	Hexachlorocyclopentadiene	10	U								
88-06-2	2,4,6-Trichlorophenol	10	U								
95-95-4	2,4,5-Trichlorophenol	50	U								
91-58-7	2-Chloronaphthalene	10	U								
88-74-4	2-Nitroaniline	50	U								
131-11-3	Dimethyl phthalate	10	U								
208-96-8	Acenaphthylene	10	U								
606-20-2	2,6-Dinitrotoluene	10	U								
99-09-2	3-Nitroaniline	50	U								
83-32-9	Acenaphthene	10	U								
51-28-5	2,4-Dinitrophenol	50	U								
100-02-7	4-Nitrophenol	50	U								
132-64-9	Dibenzofuran	10	U								
121-14-2	2,4-Dinitrotoluene	10	U								
84-66-2	Diethyl phthalate	10	U								
7005-72-3	4-Chlorophenyl phenyl ether	10	U								
86-73-7	Fluorene	10	U								
100-10-6	4-Nitroaniline	50	U								
534-52-1	4,6-Dinitro-2-Methylphenol	50	U								
86-30-6	N-Nitrosodiphenylamine	10	U								
122-66-7	1,2-Diphenylhydrazine	10	U								

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPT\DAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.								
100-75-4	N-Nitrosopiperidine	10	U								
122-09-8	Phenyl-tert-butylamine	50	U								
87-65-0	2,6-Dichlorophenol	10	U								
924-16-3	N-Nitrosodl-n-butylamine	10	U								
55-18-5	N-Nitrosodiethylamine	10	U								
930-55-2	N-Nitrosopyrrolidine	10	U								
92-87-5	Benzidine	50	U								
95-94-3	1,2,4,5-Tetrachlorobenzene	50	U								
608-93-5	Pentachlorobenzene	50	U								
134-32-7	1-Naphthylamine	50	U								
91-59-8	2-Naphthylamine	50	U								
58-90-2	2,3,4,6-Tetrachlorophenol	10	U								
122-39-4	Diphenylamine	10	U								
62-44-2	Phenacetyl	10	U								
92-67-1	4-Aminobiphenyl	50	U								
82-68-8	Pentachloronitrobenzene	50	U								
23950-58-5	Pronamide	10	U								
60-11-7	p-(Dimethylamino)azobenzene	10	U								
57-97-6	7,12-Dimethylbenz[a]anthracene	10	U								
56-49-5	Methylcholanthrene	10	U								
110-86-1	Pyridine	50	U								
10595-95-6	N-Nitrosomethylethylamine	10	U								
59-89-2	N-Nitrosomorpholine	10	U								
95-53-4	o-Toluidine	10	U								

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:		20884		20884		20884		20850		20850	
CAS RN	Common name	µg/l	Qual.								
108-39-4	3-Methylphenol	10	U								
1888-71-7	Hexachloropropene	50	U								
106-50-3	p-Phenylenediamine	50	U								
94-59-7	Safrole	50	U								
120-58-1	Isosafrole	50	U								
130-15-4	1,4-Naphthoquinone	50	U								
99-65-0	1,3-Dinitrobenzene	10	U								
99-55-8	5-Nitro-o-toluidine	10	U								
99-35-4	1,3,5-Trinitrobenzene	10	U								
56-57-5	4-Nitroquinoline 1-oxide	10	U								
91-80-5	Methapyrilene	50	U								
119-93-7	3,3'-Dimethylbenzidine	10	U								
53-96-3	2-Acetylaminofluorene	10	U								
70-30-4	Hexachlorophene	50	U								

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1		MPT-22-MW1-1		MPT-1-MW1-1		MPT-S-1-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/05/92		02/12/92		02/12/92	
DATE SAMPLED:		20884		20837		20902		20902	
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
62-75-9	N-Nitrosodimethylamine	10	U	10	U	10	U	10	U
108-95-2	Phenol	10	U	10	U	10	U	10	U
62-53-3	Aniline	10	U	10	U	10	U	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U	10	U	10	U	10	U
95-57-8	2-Chlorophenol	10	U	10	U	10	U	10	U
541-73-1	1,3-Dichlorobenzene	10	U	10	U	10	U	10	U
106-46-7	1,4-Dichlorobenzene	10	U	10	U	10	U	10	U
100-51-6	Benzyl alcohol	10	U	10	U	10	U	10	U
95-50-1	1,2-Dichlorobenzene	10	U	10	U	10	U	10	U
95-48-7	2-Methylphenol	10	U	10	U	10	U	10	U
39638-32-9	bis(2-chloroethyl)Ether	10	U	10	U	10	U	10	U
106-44-5	4-Methylphenol	10	U	10	U	10	U	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U	10	U	10	U	10	U
67-72-1	Hexachloroethane	10	U	10	U	10	U	10	U
98-95-3	Nitrobenzene	10	U	10	U	10	U	10	U
78-59-1	Isophorone	10	U	10	U	10	U	10	U
88-75-5	2-Nitrophenol	10	U	10	U	10	U	10	U
105-67-9	2,4-Dimethylphenol	10	U	10	U	10	U	10	U
65-75-0	Benzoic Acid	50	U	50	U	50	U	50	U
111-91-1	Bis(2-chloroethoxy)methane	10	U	10	U	10	U	10	U
120-83-2	2,4-Dichlorophenol	10	U	10	U	10	U	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U
91-20-3	Naphthalene	10	U	10	U	10	U	10	U
106-47-8	4-Chloroaniline	10	U	10	U	10	U	10	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1	MPT-22-MW1-1	MPT-1-MW1-1	MPT-S-1-1
LOCATION:		WATER	WATER	WATER	WATER
SAMPLE MATRIX:		02/11/92	02/05/92	02/12/92	02/12/92
DATE SAMPLED:		20884	20837	20902	20902
LAB NUMBER:					
CAS RN	Common name	µg/l	µg/l	µg/l	µg/l
		Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.
87-68-3	Hexachlorobutadiene	10	10	10	10
59-50-7	4-Chloro-3-Methylphenol	10	10	10	10
91-57-6	2-Methylnaphthalene	10	10	10	10
77-47-4	Hexachlorocyclopentadiene	10	10	10	10
88-06-2	2,4,6-Trichlorophenol	10	10	10	10
95-95-4	2,4,5-Trichlorophenol	50	50	50	50
91-58-7	2-Chloronaphthalene	10	10	10	10
88-74-4	2-Nitroaniline	50	50	50	50
131-11-3	Dimethyl phthalate	10	10	10	10
208-96-8	Acenaphthylene	10	10	10	10
606-20-2	2,6-Dinitrotoluene	10	10	10	10
99-09-2	3-Nitroaniline	50	50	50	50
83-32-9	Acenaphthene	10	10	10	10
51-28-5	2,4-Dinitrophenol	50	50	50	50
100-02-7	4-Nitrophenol	50	50	50	50
132-64-9	Dibenzofuran	10	10	10	10
121-14-2	2,4-Dinitrotoluene	10	10	10	10
84-66-2	Diethyl phthalate	10	10	10	10
7005-72-3	4-Chlorophenyl phenyl ether	10	10	10	10
86-73-7	Fluorene	10	10	10	10
100-10-6	4-Nitroaniline	50	50	50	50
534-52-1	4,6-Dinitro-2-Methylphenol	50	50	50	50
86-30-6	N-Nitrosodiphenylamine	10	10	10	10
122-66-7	1,2-Diphenylhydrazine	10	10	10	10

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1	MPT-22-MW1-1	MPT-1-MW1-1	MPT-S-1-1
LOCATION:		WATER	WATER	WATER	WATER
SAMPLE MATRIX:		02/11/92	02/05/92	02/12/92	02/12/92
DATE SAMPLED:		20884	20837	20902	20902
LAB NUMBER:					
CAS RN	Common name	µg/l	µg/l	µg/l	µg/l
		Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.
101-55-3	4-Bromophenyl phenyl ether	10	10	10	10
118-74-1	Hexachlorobenzene	10	10	10	10
87-86-5	Pentachlorophenol	50	50	7	8
85-01-8	Phenanthrene	10	10	10	10
120-12-7	Anthracene	10	10	10	10
84-74-2	Di-n-butyl phthalate	3	2	4	3
206-44-0	Fluoranthene	10	10	10	10
129-00-0	Pyrene	10	10	10	10
85-68-7	Butyl benzyl phthalate	10	10	10	10
91-94-1	3,3'-Dichlorobenzidine	20	20	20	20
56-55-3	Benzo[a]anthracene	10	10	10	2
218-01-9	Chrysene	10	10	10	10
117-81-7	Bis(2-ethylhexyl) phthalate	41	10	7	6
117-84-0	Di-n-octyl phthalate	10	10	10	10
205-99-2	Benzo[b]fluoranthene	10	10	10	10
207-08-9	Benzo[k]fluoranthene	10	10	10	10
50-32-8	Benzo[a]pyrene	10	10	10	10
193-39-5	Indeno(1,2,3-cd)pyrene	10	10	10	10
53-70-3	Dibenz[a,h]anthracene	10	10	10	10
191-24-2	Benzo[ghi]perylene	10	10	10	10
109-06-8	2-Picoline	50	50	50	50
66-27-3	Methyl methanesulfonate	10	10	10	10
62-50-0	Ethyl methanesulfonate	10	10	10	10
98-86-2	Acetophenone	10	10	10	10

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1	MPT-22-MW1-1	MPT-1-MW1-1	MPT-S-1-1
LOCATION:		WATER	WATER	WATER	WATER
SAMPLE MATRIX:		02/11/92	02/05/92	02/12/92	02/12/92
DATE SAMPLED:		20884	20837	20902	20902
LAB NUMBER:					
CAS RN	Common name	µg/l	µg/l	µg/l	µg/l
		Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.
100-75-4	N-Nitrosopiperidine	10 U	10 U	10 U	10 U
122-09-8	Phenyl-tert-butylamine	50 U	50 U	50 U	50 U
87-65-0	2,6-Dichlorophenol	10 U	10 U	10 U	10 U
924-16-3	N-Nitrosodi-n-butylamine	10 U	10 U	10 U	10 U
55-18-5	N-Nitrosodiethylamine	10 U	10 U	10 U	10 U
930-55-2	N-Nitrosopyrrolidine	10 U	10 U	10 U	10 U
92-87-5	Benzidine	50 U	50 U	50 U	50 U
95-94-3	1,2,4,5-Tetrachlorobenzene	50 U	50 U	50 U	50 U
608-93-5	Pentachlorobenzene	50 U	50 U	50 U	50 U
134-32-7	1-Naphthylamine	50 U	50 U	50 U	50 U
91-59-8	2-Naphthylamine	50 U	50 U	50 U	50 U
58-90-2	2,3,4,6-Tetrachlorophenol	10 U	10 U	10 U	10 U
122-39-4	Diphenylamine	10 U	10 U	10 U	10 U
62-44-2	Phenacetin	10 U	10 U	10 U	10 U
92-67-1	4-Aminobiphenyl	50 U	50 U	50 U	50 U
82-68-8	Pentachloronitrobenzene	50 U	50 U	50 U	50 U
23950-58-5	Pronamide	10 U	10 U	10 U	10 U
60-11-7	p-(Dimethylamino)azobenzene	10 U	10 U	10 U	10 U
57-97-6	7,12-Dimethylbenz[a]anthracene	10 U	10 U	10 U	10 U
56-49-5	Methylcholanthrene	10 U	10 U	10 U	10 U
110-86-1	Pyridine	50 U	50 U	50 U	50 U
10595-95-6	N-Nitrosomethylethylamine	10 U	10 U	10 U	10 U
59-89-2	N-Nitrosomorpholine	10 U	10 U	10 U	10 U
95-53-4	o-Toluidine	10 U	10 U	10 U	10 U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1		MPT-22-MW1-1		MPT-1-MW1-1		MPT-S-1-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/05/92		02/12/92		02/12/92	
DATE SAMPLED:		20884		20837		20902		20902	
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
108-39-4	3-Methylphenol	10	U	10	U	10	U	10	U
1888-71-7	Hexachloropropene	50	U	50	U	50	U	50	U
106-50-3	p-Phenylenediamine	50	U	50	U	50	U	50	U
94-59-7	Safrole	50	U	50	U	50	U	50	U
120-58-1	Isosafrole	50	U	50	U	50	U	50	U
130-15-4	1,4-Naphthoquinone	50	U	50	U	50	U	50	U
99-65-0	1,3-Dinitrobenzene	10	U	10	U	10	U	10	U
99-55-8	5-Nitro-o-toluidine	10	U	10	U	10	U	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U	10	U	10	U	10	U
56-57-5	4-Nitroquinoline 1-oxide	10	U	10	U	10	U	10	U
91-80-5	Methapyrilene	50	U	50	U	50	U	50	U
119-93-7	3,3'-Dimethylbenzidine	10	U	10	U	10	U	10	U
53-96-3	2-Acetylaminofluorene	10	U	10	U	10	U	10	U
70-30-4	Hexachlorophene	50	U	50	U	50	U	50	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:IMPTDAT4.WK1		MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/09/92		02/10/92	
DATE SAMPLED:		20884		20884		20884		20866		20877	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
319-84-6	alpha-BHC	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
319-85-7	beta-BHC	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
319-86-8	delta-BHC	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
76-44-8	Heptachlor	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
309-00-2	Aldrin	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
959-98-8	Endosulfan I	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
60-57-1	Dieldrin	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-55-9	4,4'-DDE	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-20-8	Endrin	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
33213-65-9	Endosulfan II	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-54-8	4,4'-DDD	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
7421-93-4	Endrin aldehyde	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
1031-07-8	Endosulfan sulfate	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
50-29-3	4,4'-DDT	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-43-5	Methoxychlor	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
53494-70-5	Endrin Ketone	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
57-74-09	Chlordane	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
8001-35-2	Toxaphene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
12674-11-2	Aroclor-1016	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
11104-28-2	Aroclor-1221	2	U	2	U	2	U	2	U	2	U
11141-16-5	Aroclor-1232	2	U	2	U	2	U	2	U	2	U
53469-21-9	Aroclor-1242	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/09/92		02/10/92	
DATE SAMPLED:		20884		20884		20884		20866		20877	
LAB NUMBER:											
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
12672-29-6	Aroclor-1248	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
11097-69-1	Aroclor-1254	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
11096-82-5	Aroclor-1260	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
510-15-6	Chlorobenzilate	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2303-16-4	Diallate	1	U	1	U	1	U	1	U	1	U
465-73-6	Isodrin	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
143-50-0	Kepona	NR		NR		NR		NR		NR	

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
319-84-6	alpha-BHC	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
319-85-7	beta-BHC	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
319-86-8	delta-BHC	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
76-44-8	Heptachlor	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
309-00-2	Aldrin	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
959-98-8	Endosulfan I	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
60-57-1	Dieldrin	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-55-9	4,4'-DDE	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-20-8	Endrin	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
33213-65-9	Endosulfan II	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-54-8	4,4'-DDD	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
7421-93-4	Endrin aldehyde	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
1031-07-8	Endosulfan sulfate	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
50-29-3	4,4'-DDT	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-43-5	Methoxychlor	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
53494-70-5	Endrin Ketone	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
57-74-09	Chlordane	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
8001-35-2	Toxaphene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
12674-11-2	Aroclor - 1016	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
11104-28-2	Aroclor - 1221	2	U	2	U	2	U	2	U	2	U
11141-16-5	Aroclor - 1232	2	U	2	U	2	U	2	U	2	U
53469-21-9	Aroclor - 1242	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDATA4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1			
LOCATION:		WATER		WATER		WATER		WATER		WATER			
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92			
DATE SAMPLED:		20877		20877		20884		20884		20884			
LAB NUMBER:													
CAS RN	Common name	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.
12672-29-6	Aroclor-1248	0.4	U	U	0.4	U	U	0.4	U	U	0.4	U	U
11097-69-1	Aroclor-1254	0.2	U	U	0.2	U	U	0.2	U	U	0.2	U	U
11096-82-5	Aroclor-1260	0.2	U	U	0.2	U	U	0.2	U	U	0.2	U	U
510-15-6	Chlorobenzilate	0.5	U	U	0.5	U	U	0.5	U	U	0.5	U	U
2303-16-4	Diallate	1	U	U	1	U	U	1	U	U	1	U	U
465-73-6	Isodrin	0.02	U	U	0.02	U	U	0.02	U	U	0.02	U	U
143-50-0	Kepona	NR			NR			NR			NR		

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
CAS RN	Common name	µg/l Conc.	Qual.
319-84-6	alpha-BHC	0.01	U
319-85-7	beta-BHC	0.02	U
319-86-8	delta-BHC	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U
76-44-8	Heptachlor	0.01	U
309-00-2	Aldrin	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U
959-98-8	Endosulfan I	0.02	U
60-57-1	Dieldrin	0.02	U
72-55-9	4,4'-DDE	0.02	U
72-20-8	Endrin	0.02	U
33213-65-9	Endosulfan II	0.02	U
72-54-8	4,4'-DDD	0.02	U
7421-93-4	Endrin aldehyde	0.02	U
1031-07-8	Endosulfan sulfate	0.02	U
50-29-3	4,4'-DDT	0.02	U
72-43-5	Methoxychlor	0.04	U
53494-70-5	Endrin Ketone	0.02	U
57-74-09	Chlordane	0.1	U
8001-35-2	Toxaphene	0.5	U
12674-11-2	Aroclor-1016	0.8	U
11104-28-2	Aroclor-1221	2	U
11141-16-5	Aroclor-1232	2	U
53469-21-9	Aroclor-1242	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDATA4.WK1			
LOCATION: MPT-2-MW8-1			
SAMPLE MATRIX: WATER			
DATE SAMPLED: 02/10/92			
LAB NUMBER: 20877			
UNITS: µg/l			
CAS RN	Common name	Conc.	Qual.
12672-29-6	Aroclor-1248	0.4	U
11097-69-1	Aroclor-1254	0.2	U
11096-82-5	Aroclor-1260	0.2	U
510-15-6	Chlorobenzilate	0.5	U
2303-16-4	Diallate	1	U
465-73-6	Isodrin	0.02	U
143-50-0	Kepone	NR	

* Blank entries indicate that sample was not analyzed for that analytical group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW9S-1	MPT-2-MW9D-1	MPT-2-MW10-1	MPT-2-MW11-1	MPT-2-MW12S-1	
LOCATION:		WATER	WATER	WATER	WATER	WATER	
SAMPLE MATRIX:		02/09/92	02/09/92	02/10/92	02/05/92	02/05/92	
DATE SAMPLED:		20866	20866	20877	20837	20837	
LAB NUMBER:							
UNITS:		µg/l	µg/l	µg/l	µg/l	µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
319-84-6	alpha-BHC	0.01	U	0.01	U	0.01	U
319-85-7	beta-BHC	0.02	U	0.02	U	0.02	U
319-86-8	delta-BHC	0.01	U	0.01	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U	0.01	U	0.01	U
76-44-8	Heptachlor	0.01	U	0.01	U	0.01	U
309-00-2	Aldrin	0.01	U	0.01	U	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U	0.01	U	0.01	U
959-98-8	Endosulfan I	0.02	U	0.02	U	0.02	U
60-57-1	Dieldrin	0.02	U	0.02	U	0.02	U
72-55-9	4,4'-DDE	0.02	U	0.02	U	0.02	U
72-20-8	Endrin	0.02	U	0.02	U	0.02	U
33213-65-9	Endosulfan II	0.02	U	0.02	U	0.02	U
72-54-8	4,4'-DDD	0.02	U	0.02	U	0.02	U
7421-93-4	Endrin aldehyde	0.02	U	0.02	U	0.02	U
1031-07-8	Endosulfan sulfate	0.02	U	0.02	U	0.02	U
50-29-3	4,4'-DDT	0.02	U	0.02	U	0.02	U
72-43-5	Methoxychlor	0.04	U	0.04	U	0.04	U
53494-70-5	Endrin Ketone	0.02	U	0.02	U	0.02	U
57-74-09	Chlordane	0.1	U	0.1	U	0.1	U
8001-35-2	Toxaphene	0.5	U	0.5	U	0.5	U
12674-11-2	Aroclor-1016	0.8	U	0.8	U	0.8	U
11104-28-2	Aroclor-1221	2	U	2	U	2	U
11141-16-5	Aroclor-1232	2	U	2	U	2	U
53469-21-9	Aroclor-1242	0.8	U	0.8	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:IMPTDAT5.WK1		MPT-2-MW9S-1		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1			
LOCATION:		WATER		WATER		WATER		WATER		WATER			
SAMPLE MATRIX:		02/09/92		02/09/92		02/10/92		02/05/92		02/05/92			
DATE SAMPLED:		20866		20866		20877		20837		20837			
LAB NUMBER:													
CAS RN	UNITS:	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.
	Common name												
12672-29-6	Aroclor-1248	0.4	U	U	0.4	U	U	0.4	U	U	0.4	U	U
11097-69-1	Aroclor-1254	0.2	U	U	0.2	U	U	0.2	U	U	0.2	U	U
11096-82-5	Aroclor-1260	0.2	U	U	0.2	U	U	0.2	U	U	0.2	U	U
510-15-6	Chlorobenzilate	0.5	U	U	0.5	U	U	0.5	U	U	0.5	U	U
2303-16-4	Diallate	1	U	U	1	U	U	1	U	U	1	U	U
465-73-6	Isodrin	0.02	U	U	0.02	U	U	0.02	U	U	0.02	U	U
143-50-0	Kepona	NR			NR			NR			NR		

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92		02/10/92	
DATE SAMPLED:		20837		20902		20877		20877		20877	
LAB NUMBER:											
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
319-84-6	alpha-BHC	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
319-85-7	beta-BHC	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
319-86-8	delta-BHC	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
76-44-8	Heptachlor	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
309-00-2	Aldrin	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
959-98-8	Endosulfan I	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
60-57-1	Dieldrin	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-55-9	4,4'-DDE	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-20-8	Endrin	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
33213-65-9	Endosulfan II	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-54-8	4,4'-DDD	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
7421-93-4	Endrin aldehyde	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
1031-07-8	Endosulfan sulfate	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
50-29-3	4,4'-DDT	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
72-43-5	Methoxychlor	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
53494-70-5	Endrin Ketone	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
57-74-09	Chlordane	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
8001-35-2	Toxaphene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
12674-11-2	Aroclor-1016	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
11104-28-2	Aroclor-1221	2	U	2	U	2	U	2	U	2	U
11141-16-5	Aroclor-1232	2	U	2	U	2	U	2	U	2	U
53469-21-9	Aroclor-1242	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW12S-1D		MPT-2-MW12D-1		MPT-2-MW15S-1		MPT-2-MW15D-1		MPT-2-MW15D-1R	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/05/92		02/12/92		02/10/92		02/10/92		02/10/92	
DATE SAMPLED:		20837		20902		20877		20877		20877	
LAB NUMBER:											
CAS RN	Common name	µg/l		µg/l		µg/l		µg/l		µg/l	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
12672-29-6	Aroclor-1248	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
11097-69-1	Aroclor-1254	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
11096-82-5	Aroclor-1260	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
510-15-6	Chlorobenzilate	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2303-16-4	Diallate	1	U	1	U	1	U	1	U	1	U
465-73-6	Isodrin	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
143-50-0	Kepona	NR		NR		NR		NR		NR	

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92			
DATE SAMPLED:		20877		20931		20902			
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
319-84-6	alpha-BHC	0.01	U	0.01	U	0.01	U	0.01	U
319-85-7	beta-BHC	0.02	U	0.02	U	0.02	U	0.02	U
319-86-8	delta-BHC	0.01	U	0.01	U	0.01	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U	0.01	U	0.01	U	0.01	U
76-44-8	Heptachlor	0.01	U	0.01	U	0.01	U	0.01	U
309-00-2	Aldrin	0.01	U	0.01	U	0.01	U	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U	0.01	U	0.01	U	0.01	U
959-98-8	Endosulfan I	0.02	U	0.02	U	0.02	U	0.02	U
60-57-1	Dieldrin	0.02	U	0.02	U	0.02	U	0.02	U
72-55-9	4,4'-DDE	0.02	U	0.02	U	0.02	U	0.02	U
72-20-8	Endrin	0.02	U	0.02	U	0.02	U	0.02	U
33213-65-9	Endosulfan II	0.02	U	0.02	U	0.02	U	0.02	U
72-54-8	4,4'-DDD	0.02	U	0.02	U	0.02	U	0.02	U
7421-93-4	Endrin aldehyde	0.02	U	0.02	U	0.02	U	0.02	U
1031-07-8	Endosulfan sulfate	0.02	U	0.02	U	0.02	U	0.02	U
50-29-3	4,4'-DDT	0.02	U	0.02	U	0.02	U	0.02	U
72-43-5	Methoxychlor	0.04	U	0.04	U	0.04	U	0.04	U
53494-70-5	Endrin Ketone	0.02	U	0.02	U	0.02	U	0.02	U
57-74-09	Chlordane	0.1	U	0.1	U	0.1	U	0.1	U
8001-35-2	Toxaphene	0.5	U	0.5	U	0.5	U	0.5	U
12674-11-2	Aroclor - 1016	0.8	U	0.8	U	0.8	U	0.8	U
11104-28-2	Aroclor - 1221	2	U	2	U	2	U	2	U
11141-16-5	Aroclor - 1232	2	U	2	U	2	U	2	U
53469-21-9	Aroclor - 1242	0.8	U	0.8	U	0.8	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDATA5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92			
DATE SAMPLED:		20877		20931		20902			
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
12672-29-6	Aroclor-1248	0.4	U	0.4	U	0.4	U	0.4	U
11097-69-1	Aroclor-1254	0.2	U	0.2	U	0.2	U	0.2	U
11096-82-5	Aroclor-1260	0.2	U	0.2	U	0.2	U	0.2	U
510-15-6	Chlorobenzilate	0.5	U	0.5	U	0.5	U	0.5	U
2303-16-4	Diallate	1	U	1	U	1	U	1	U
465-73-6	Isodrin	0.02	U	0.02	U	0.02	U	0.02	U
143-50-0	Kepona	NR		NR		NR		NR	

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:		20884		20884		20884		20850		20850	
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.								
319-84-6	alpha-BHC	0.01	U								
319-85-7	beta-BHC	0.02	U								
319-86-8	delta-BHC	0.01	U								
58-89-9	gamma-BHC; Lindane	0.01	U								
76-44-8	Heptachlor	0.01	U								
309-00-2	Aldrin	0.01	U								
1024-57-3	Heptachlor epoxide	0.01	U								
959-98-8	Endosulfan I	0.02	U								
60-57-1	Dieldrin	0.02	U								
72-55-9	4,4'-DDE	0.02	U								
72-20-8	Endrin	0.02	U								
33213-65-9	Endosulfan II	0.02	U								
72-54-8	4,4'-DDD	0.02	U								
7421-93-4	Endrin aldehyde	0.02	U								
1031-07-8	Endosulfan sulfate	0.02	U								
50-29-3	4,4'-DDT	0.02	U								
72-43-5	Methoxychlor	0.04	U								
53494-70-5	Endrin Ketone	0.02	U								
57-74-09	Chlordane	0.1	U								
8001-35-2	Toxaphene	0.5	U								
12674-11-2	Aroclor-1016	0.8	U								
11104-28-2	Aroclor-1221	2	U	2	U	2	U	2	U	2	U
11141-16-5	Aroclor-1232	2	U	2	U	2	U	2	U	2	U
53469-21-9	Aroclor-1242	0.8	U								

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1			
LOCATION:		WATER		WATER		WATER		WATER		WATER			
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92			
DATE SAMPLED:		20884		20884		20884		20850		20850			
LAB NUMBER:													
CAS RN	Common name	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.	µg/l	Conc.	Qual.
12672-29-6	Aroclor-1248	0.4	U	U	0.4	U	U	0.4	U	U	0.4	U	U
11097-69-1	Aroclor-1254	0.2	U	U	0.2	U	U	0.2	U	U	0.2	U	U
11096-82-5	Aroclor-1260	0.2	U	U	0.2	U	U	0.2	U	U	0.2	U	U
510-15-6	Chlorobenzilate	0.5	U	U	0.5	U	U	0.5	U	U	0.5	U	U
2303-16-4	Diallate	1	U	U	1	U	U	1	U	U	1	U	U
465-73-6	Isodrin	0.02	U	U	0.02	U	U	0.02	U	U	0.02	U	U
143-50-0	Kepona	NR			NR			NR			NR		

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1		MPT-22-MW1-1		MPT-1-MW1-1		MPT-S-1-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/05/92		02/12/92		02/12/92	
DATE SAMPLED:		20884		20837		20902		20902	
LAB NUMBER:									
CAS RN	Common name	µg/l Conc.	Qual.	µg/l Conc.	Qual.	µg/l Conc.	Qual.	µg/l Conc.	Qual.
319-84-6	alpha-BHC	0.01	U	0.01	U	0.01	U	0.01	U
319-85-7	beta-BHC	0.02	U	0.02	U	0.02	U	0.02	U
319-86-8	delta-BHC	0.01	U	0.01	U	0.01	U	0.01	U
58-89-9	gamma-BHC; Lindane	0.01	U	0.01	U	0.01	U	0.01	U
76-44-8	Heptachlor	0.01	U	0.01	U	0.01	U	0.01	U
309-00-2	Aldrin	0.01	U	0.01	U	0.01	U	0.01	U
1024-57-3	Heptachlor epoxide	0.01	U	0.01	U	0.01	U	0.01	U
959-98-8	Endosulfan I	0.02	U	0.02	U	0.02	U	0.02	U
60-57-1	Dieldrin	0.02	U	0.02	U	0.02	U	0.02	U
72-55-9	4,4'-DDE	0.02	U	0.02	U	0.02	U	0.02	U
72-20-8	Endrin	0.02	U	0.02	U	0.02	U	0.02	U
33213-65-9	Endosulfan II	0.02	U	0.02	U	0.02	U	0.02	U
72-54-8	4,4'-DDD	0.02	U	0.02	U	0.02	U	0.02	U
7421-93-4	Endrin aldehyde	0.02	U	0.02	U	0.02	U	0.02	U
1031-07-8	Endosulfan sulfate	0.02	U	0.02	U	0.02	U	0.02	U
50-29-3	4,4'-DDT	0.02	U	0.02	U	0.02	U	0.02	U
72-43-5	Methoxychlor	0.04	U	0.04	U	0.04	U	0.04	U
53494-70-5	Endrin Ketone	0.02	U	0.02	U	0.02	U	0.02	U
57-74-09	Chlordane	0.1	U	0.1	U	0.1	U	0.1	U
8001-35-2	Toxaphene	0.5	U	0.5	U	0.5	U	0.5	U
12674-11-2	Aroclor-1016	0.8	U	0.8	U	0.8	U	0.8	U
11104-28-2	Aroclor-1221	2	U	2	U	2	U	2	U
11141-16-5	Aroclor-1232	2	U	2	U	2	U	2	U
53469-21-9	Aroclor-1242	0.8	U	0.8	U	0.8	U	0.8	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW6-1	MPT-22-MW1-1	MPT-1-MW1-1	MPT-S-1-1
LOCATION:		WATER	WATER	WATER	WATER
SAMPLE MATRIX:		02/11/92	02/05/92	02/12/92	02/12/92
DATE SAMPLED:		20884	20837	20902	20902
LAB NUMBER:					
CAS RN	Common name	µg/l	µg/l	µg/l	µg/l
		Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.
12672-29-6	Aroclor-1248	0.4	0.4	0.4	0.4
		U	U	U	U
11097-69-1	Aroclor-1254	0.2	0.2	0.2	0.2
		U	U	U	U
11096-82-5	Aroclor-1260	0.2	0.2	0.2	0.2
		U	U	U	U
510-15-6	Chlorobenzilate	0.5	0.5	0.5	0.5
		U	U	U	U
2303-16-4	Diallate	1	1	1	1
		U	U	U	U
465-73-6	Isodrin	0.02	0.02	0.02	0.02
		U	U	U	U
143-50-0	Kepono	NR	NR	NR	NR

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: GROUNDWATER

CAS RN	Common name	MPT-2-MW1-1		MPT-2-MW2-1		MPT-2-MW2-1D		MPT-2-MW3-1		MPT-2-MW4-1	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
		µg/l		µg/l		µg/l		µg/l		µg/l	
7440-36-0	Antimony	17.3	B	10.1	U	10.1	U	10.9	U	14.3	B
7440-38-2	Arsenic	6	B	1	B	0.9	B	3.5	B	1.8	B
7440-39-3	Barium	20.1	B	12.7	B	13.2	B	82.7	B	45.6	B
7440-41-7	Beryllium	0.3	U	0.3	U	0.3	U	0.19	U	0.3	U
7440-43-9	Cadmium	1	U	1	U	1	U	2.9	U	1	U
7440-70-2	Calcium	305000		99000		98600		212000		240000	
7440-47-3	Chromium	2	U	2	U	2	U	2.1	U	2	U
7440-48-4	Cobalt	4.8	B	3.1	U	3.1	U	3.6	U	3.1	U
7440-50-8	Copper	1.4	U	1.4	U	1.4	U	2.9	B	1.4	U
7440-89-6	Iron	700		323		299		1090		381	
7440-92-1	Lead	0.7	U	0.7	U	0.7	U	4.9	B	0.7	U
7440-95-4	Magnesium	262000		30800		26900		467000		130000	
7440-96-5	Manganese	556		269		273		785		162	
7440-97-6	Mercury	0.1	U	0.1	U	0.1	U	0.16	U	0.1	U
7440-02-0	Nickel	6.5	U	6.5	U	6.5	U	3.8	U	7.1	B
7440-49-2	Selenium	3	U	0.6	U	0.6	U	12.8	U	3	U
7440-22-4	Silver	1.2	U	1.2	U	1.2	U	1.7	U	1.2	U
7440-23-5	Sodium	1990000		189000		156000		3850000		494000	
7440-28-0	Thallium	0.9	U	0.9	U	1	B	7	U	0.9	U
7440-62-2	Vanadium	9.5	B	8.4	B	8.8	B	6	B	9.4	B
7440-66-6	Zinc	2.7	B	10	B	8.2	B	7.3	B	5.6	B
7440-31-5	Tin	14.5	U	14.5	U	14.5	U	208	U	14.5	U
	Cyanide	3.7	B	2	U	2	U	7	B	9	B

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW5-1		MPT-2-MW5-1D		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/10/92		02/11/92		02/11/92		02/11/92	
DATE SAMPLED:		20877		20877		20884		20884		20884	
LAB NUMBER:		20877		20877		20884		20884		20884	
CAS RN	Common name	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.	µg/l	Qual.
7440-36-0	Antimony	10.1	U	10.1	U	10.1	U	23.7	B	34	B
7440-38-2	Arsenic	0.4	U	0.6	B	1.3	B	23	B	4	B
7440-39-3	Barium	33.9	B	34	B	15.1	B	18.3	B	34	B
7440-41-7	Beryllium	0.3	U	0.3	U	0.5	B	0.3	U	0.3	U
7440-43-9	Cadmium	1	U	1	U	1	U	1	U	1	U
7440-70-2	Calcium	174000		174000		98600		327000		349000	
7440-47-3	Chromium	2	U	2	U	2	U	2	U	2	U
7440-48-4	Cobalt	3.1	U	3.1	U	3.2	B	4.8	B	3.1	U
7440-50-8	Copper	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
7440-89-6	Iron	1640		2190		1220		2150		798	
7440-92-1	Lead	0.7	U	0.7	U	0.7	U	0.7	U	7	U
7440-95-4	Magnesium	86300		86000		55200		345000		625000	
7440-96-5	Manganese	110		112		104		1650		1460	
7440-97-6	Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
7440-02-0	Nickel	6.5	U	8	B	8.6	B	11.3	B	6.5	U
7440-49-2	Selenium	0.6	U	3	U	0.6	U	6	U	12	U
7440-22-4	Silver	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
7440-23-5	Sodium	147000		147000		376000		2740000		4930000	
7440-28-0	Thallium	0.9	U	0.9	U	0.9	U	0.9	U	9	B
7440-62-2	Vanadium	4.8	B	4.7	B	3.2	B	9.8	B	6	B
7440-66-6	Zinc	4.3	B	4.3	B	2.2	B	4.5	B	3	B
7440-31-5	Tin	14.5	U	22.2	U	14.5	U	14.5	U	14.5	U
	Cyanide	2	U	2	U	2.2	B	3.6	B	10.9	

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: GROUNDWATER

A:\MPTDAT4.WK1		MPT-2-MW8-1	
LOCATION:		WATER	
SAMPLE MATRIX:		02/10/92	
DATE SAMPLED:		20877	
LAB NUMBER:			
UNITS:		µg/l	
CAS RN	Common name	Conc.	Qual.
7440-36-0	Antimony	10.1	U
7440-38-2	Arsenic	0.7	B
7440-39-3	Barium	36	B
7440-41-7	Beryllium	0.3	U
7440-43-9	Cadmium	1	U
7440-70-2	Calcium	19400	
7440-47-3	Chromium	2	U
7440-48-4	Cobalt	3.2	B
7440-50-8	Copper	3.3	B
7440-89-6	Iron	429	
7440-92-1	Lead	3.6	
7440-95-4	Magnesium	206000	
7440-96-5	Manganese	58.8	
7440-97-6	Mercury	0.1	U
7440-02-0	Nickel	11.6	B
7440-49-2	Selenium	3	U
7440-22-4	Silver	1.2	U
7440-23-5	Sodium	2420000	
7440-28-0	Thallium	0.9	U
7440-62-2	Vanadium	57	
7440-66-6	Zinc	77.2	
7440-31-5	Tin	14.5	U
	Cyanide	7.2	B

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: GROUNDWATER

A:\MPTDAT5.WK1

LOCATION: MPT-2-MW9S-1 MPT-2-MW9D-1 MPT-2-MW10-1 MPT-2-MW11-1 MPT-2-MW12S-1

SAMPLE MATRIX: WATER WATER WATER WATER WATER

DATE SAMPLED: 02/09/92 02/09/92 02/10/92 02/05/92 02/05/92

LAB NUMBER: 20866 20866 20877 20837 20837

UNITS:

Common name

CAS RN	Conc. µg/l	Qual.								
7440-36-0	10.9	U	10.9	U	17.4	B	10.9	U	10.9	U
7440-38-2	0.69	U	19.1	B	5	B	10.5	B	2.8	B
7440-39-3	8.7	B	27	B	29.1	B	28.4	B	32.3	B
7440-41-7	0.19	U	0.25	B	0.3	U	0.54	B	0.46	B
7440-43-9	2.9	U	2.9	U	1	U	2.9	U	2.9	U
7440-70-2	79600		319000		162000		202000		256000	
7440-47-3	2.1	U	3.2	B	2	U	12.2		10.2	
7440-48-4	3.6	U	3.6	U	3.1	U	3.8	B	3.6	U
7440-50-8	3.1	B	9.6	B	1.4	U	7.4	B	11.4	B
7440-89-6	162		1260		474		9770		3580	
7440-92-1	4.8		8.8	B	7	U	2.1	B	0.78	U
7440-95-4	300000		1080000		282000		304000		401000	
7440-96-5	101		49		102		673		652	
7440-97-6	0.16	U	0.16	U	0.1	U	0.16	U	0.16	U
7440-02-0	5.1	B	12.1	B	6.5	U	4.7	B	18.5	B
7440-49-2	128	U	128	U	3	U	1.5	B	2.5	B
7440-22-4	1.7	U	1.7	U	1.2	U	1.7	U	1.7	U
7440-23-5	2660000		8780000		2900000		2500000		3470000	
7440-28-0	7	U	7	U	0.9	U	1.4	U	1.4	U
7440-62-2	208	U	208	U	8	B	208	U	208	U
7440-66-6	4.1	B	3.7	B	4.1	B	24	B	16.4	B
7440-31-5	7.6	B	12.8	B	14.5	U	25.5	U	45.4	B
Cyanide	6.9	B	306	B	2.6	B	1.8	U	8.6	B

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: GROUNDWATER

A:\MPTDAT5.WK1
 LOCATION: MPT-2-MW12S-1D MPT-2-MW12D-1 MPT-2-MW15S-1 MPT-2-MW15D-1 MPT-2-MW15D-1R
 SAMPLE MATRIX: WATER WATER WATER WATER WATER
 DATE SAMPLED: 02/05/92 02/12/92 02/10/92 02/10/92 02/10/92
 LAB NUMBER: 20837 20902 20877 20877 20877

CAS RN	Common name	µg/l		µg/l		µg/l		µg/l		µg/l	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
7440-36-0	Antimony	10.9	U	40.9	B	10.2	B	38	U		
7440-38-2	Arsenic	2.2	B	5	B	138	B	8	B		
7440-39-3	Barium	28.7	B	42.1	B	36.8	B	20.2	B		
7440-41-7	Beryllium	0.34	B	0.62	B	0.3	U	0.3	U		
7440-43-9	Cadmium	2.9	U	1	U	1	U	1	U		
7440-70-2	Calcium	245000		492000		315000		255000			
7440-47-3	Chromium	6.6	B	2	U	2	U	2	U		
7440-48-4	Cobalt	3.6	U	3.1	U	3.1	U	5.9	B		
7440-50-8	Copper	11.4	B	1.4	U	1.4	U	1.4	U		
7440-89-6	Iron	2810		449		19100		232			
7440-92-1	Lead	7.2	B	7	U	1.4	B	7	U		
7440-95-4	Magnesium	387000		1070000		103000		730000			
7440-96-5	Manganese	635		235		3340		223			
7440-97-6	Mercury	0.16	U	0.1	U	0.1	U	0.1	U		
7440-02-0	Nickel	8.6	B	6.5	U	21.2	B	6.5	U		
7440-49-2	Selenium	1.6	B	12	U	3	U	30	U		
7440-22-4	Silver	1.7	U	1.2	U	1.2	U	1.2	U		
7440-23-5	Sodium	3260000		8020000		595000		6920000			
7440-28-0	Thallium	1.4	U	9	U	0.9	U	9	U		
7440-62-2	Vanadium	208	U	13.1	B	12.2	B	6.7	B		
7440-66-6	Zinc	11.5	B	6.2	B	11.6	B	3.8	B		
7440-31-5	Tin	20.8		14.5	U	14.5	U	14.5	U		
	Cyanide	17.4		3	U	24.1		35.1			

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: GROUNDWATER

A:IMPTDAT5.WK1		MPT-2-MW16S-1		MPT-2-MW16DD-1		MPT-2-MW17S-1		MPT-2-MW17D-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/10/92		02/14/92		02/12/92		02/12/92	
DATE SAMPLED:		20877		20931		20902		20902	
LAB NUMBER:									
UNITS:		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
7440-36-0	Antimony	10.1	U	44.5	B	10.1	U		
7440-38-2	Arsenic	1	B	4	U	14.6			
7440-39-3	Barium	12.8	B	62.4	B	10.3	B		
7440-41-7	Beryllium	0.3	U	0.3	U	0.3	U		
7440-43-9	Cadmium	1	U	1	U	1	U		
7440-70-2	Calcium	111000		474000		240000			
7440-47-3	Chromium	2	U	2	U	2	U		
7440-48-4	Cobalt	3.2	B	3.1	U	3.1	U		
7440-50-8	Copper	1.4	U	1.4	U	1.4	U		
7440-89-6	Iron	382	U	7	U	3990			
7440-92-1	Lead	0.8	B	7	U	5			
7440-95-4	Magnesium	57800		1110000		22100			
7440-96-5	Manganese	207		93.6		786			
7440-97-6	Mercury	0.1	U	0.1	U	0.1	U		
7440-02-0	Nickel	6.5	U	6.5	U	6.5	B		
7440-49-2	Selenium	0.6	U	12	U	0.6	U		
7440-22-4	Silver	1.2	U	1.2	U	1.2	U		
7440-23-5	Sodium	502000		8210000		40600			
7440-28-0	Thallium	0.9	U	9	U	0.9	U		
7440-62-2	Vanadium	7.7	B	5.7	B	12.1	B		
7440-66-6	Zinc	4.6	B	58.2		11.5	B		
7440-31-5	Tin	14.5	U	14.5	U	14.5	U		
	Cyanide	2	U	3	U	3	U		

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: GROUNDWATER

A:\MPTDAT6.WK1		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:		20884		20884		20884		20850		20850	
UNITS:		µg/l		µg/l		µg/l		µg/l		µg/l	
CAS RN	Common name	Conc.	Qual.								
7440-36-0	Antimony	10.1	U	10.1	U	10.1	U	11.1	B	10.9	U
7440-38-2	Arsenic	2.8	B	5.1	B	2.2	B	11.3	B	2.8	B
7440-39-3	Barium	10.9	B	9.6	B	8.7	B	63.3	B	15.7	B
7440-41-7	Beryllium	0.5	B	0.3	U	0.3	U	1.6	B	0.21	B
7440-43-9	Cadmium	1	U	1	U	1	U	2.9	U	2.9	U
7440-70-2	Calcium	103000		122000		116000		199000		114000	
7440-47-3	Chromium	2	U	2	U	2	U	56.6		11	
7440-48-4	Cobalt	3.1	U	3.1	U	3.1	U	8.4	B	3.6	U
7440-50-8	Copper	1.4	U	1.4	U	1.4	U	19.8	B	69.5	
7440-89-6	Iron	2830		1900		201		30900		5460	
7440-92-1	Lead	0.7	U	0.7	U	0.7	U	13.6		4.6	
7440-95-4	Magnesium	6890		40300		36100		69500		30400	
7440-96-5	Manganese	202		106		69.2		387		102	
7440-97-6	Mercury	0.1	U	0.1	U	0.13	B	0.16	U	0.16	U
7440-02-0	Nickel	6.5	U	8	B	6.5	U	18.7	B	146	
7440-49-2	Selenium	0.6	U	0.6	U	0.6	U	2.2	B	1.3	U
7440-22-4	Silver	1.2	U	1.2	U	1.2	U	1.7	U	1.7	U
7440-23-5	Sodium	32100		184000		184000		591000		186000	
7440-28-0	Thallium	0.9	U	0.9	U	0.9	U	1.4	U	1.4	U
7440-62-2	Vanadium	2.6	B	3	B	3	B	208	U	208	U
7440-66-6	Zinc	6.1	B	2	U	2.2	B	68.6		12.8	B
7440-31-5	Tin	14.5	U	14.5	U	14.5	U	71.8		99.9	
	Cyanide	2	U	4.4	B	4.5	B	NR		NR	

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: GROUNDWATER

CAS RN	Common name	MPT-13-MW6-1		MPT-22-MW1-1		MPT-1-MW1-1		MPT-S-1-1	
		Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
7440-36-0	Antimony	10.1	U	10.9	U	10.1	U	10.1	U
7440-38-2	Arsenic	0.7	B	3.2	B	14.3		0.4	U
7440-39-3	Barium	9	B	11.5	B	0.82	B	0.66	B
7440-41-7	Beryllium	0.3	U	0.23	B	0.3	U	0.3	U
7440-43-9	Cadmium	1	U	2.9	U	1	U	1	U
7440-70-2	Calcium	124000		158000		69400		91400	
7440-47-3	Chromium	2	U	5.9	B	2	U	2	U
7440-48-4	Cobalt	4.1	B	3.6	U	3.1	U	3.1	U
7440-50-8	Copper	1.4	U	9.1	B	1.4	B	1.4	U
7440-89-6	Iron	749		2960		3540		156	
7440-92-1	Lead	0.8	B	1.6	B	2.5	B	1.4	B
7440-95-4	Magnesium	44400		28700		3100	B	17600	
7440-96-5	Manganese	41.5		168		397		33.2	
7440-97-6	Mercury	0.1	U	0.16	U	0.1	U	0.1	U
7440-02-0	Nickel	6.5	U	8.3	B	6.5	U	6.5	U
7440-49-2	Selenium	0.6	U	1.3	U	0.63	B	0.6	U
7440-22-4	Silver	1.2	U	1.7	U	1.2	U	1.2	U
7440-23-5	Sodium	180000		249000		5880		7330	
7440-28-0	Thallium	0.9	U	1.4	U	0.9	U	0.9	U
7440-62-2	Vanadium	6	B	208	U	9.4	B	2.2	B
7440-66-6	Zinc	5.1	B	6.8	B	10.2	B	2.4	B
7440-31-5	Tin	14.5	U	20.6		14.5	U	14.5	U
	Cyanide	3.3	B	1.8	U	3	U	3	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-11S	MPT-2-11SDL	MPT-2-12S	MPT-2-12SDL	MPT-2-16S
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
DATE SAMPLED:		20753	20753	20753	20753	20753
LAB NUMBER:		20753	20753	20753	20753	20753
CAS RN	Common name	µg/Kg Conc.	µg/Kg Conc.	µg/Kg Conc.	µg/Kg Conc.	µg/Kg Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
10061-02-6	trans-1,3-Dichloropropene	6 U		6 U		6 U
110-75-8	2-Chloroethylvinylether	12 U		11 U		12 U
75-25-2	Bromoform	6 U		6 U		6 U
591-78-6	2-Hexanone	12 U		11 U		12 U
108-10-1	4-Methyl-2-Pentanone	12 U		11 U		12 U
127-18-4	Tetrachloroethene	6 U		6 U		6 U
79-34-5	1,1,2,2-Tetrachloroethane	6 U		6 U		6 U
108-88-3	Toluene	6 U		6 U		6 U
108-90-7	Chlorobenzene	6 U		6 U		6 U
100-41-4	Ethylbenzene	6 U		6 U		6 U
100-42-5	Styrene	6 U		6 U		6 U
1330-20-7	Xylene (total)	2 J		2 J		2 J
541-73-1	1,3-Dichlorobenzene	6 U		6 U		6 U
106-46-7	1,4-Dichlorobenzene	6 U		6 U		6 U
95-50-1	1,2-Dichlorobenzene	6 U		6 U		6 U
107-02-8	Acrolein	120 U		110 U		120 U
74-88-4	Iodomethane	12 U		11 U		12 U
107-13-1	Acrylonitrile	120 U		110 U		120 U
74-95-3	Dibromomethane	6 U		6 U		6 U
97-63-2	Ethyl Methacrylate	6 U		6 U		6 U
98-18-4	1,2,3-Trichloropropane	6 U		6 U		6 U
110-57-6	trans-1,4-Dichloro-2-butene	6 U		6 U		6 U
75-05-8	Acetonitrile	120 U		110 U		120 U
107-05-1	3-Chloropropene	6 U		6 U		6 U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-11S		MPT-2-11SDL		MPT-2-12S		MPT-2-12SDL		MPT-2-16S	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:											
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
107-12-0	Propionitrile	120	U			110	U			120	U
126-98-7	Methacrylonitrile	6	U			6	U			6	U
123-91-1	1,4-Dioxane	240	U			220	U			240	U
80-62-6	Methyl methacrylate	12	U			11	U			12	U
106-93-4	1,2-Dibromoethane	6	U			6	U			6	U
630-20-6	1,1,1,2-Tetrachloroethane	6	U			6	U			6	U
96-12-8	1,2-Dibromo-3-chloropropane	12	U			11	U			12	U
76-01-7	Pentachloroethane	12	U			11	U			12	U
78-83-1	Isobutyl alcohol	240	U			220	U			240	U
126-99-8	Chloroprene	240	U			220	U			240	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT\7.WK1		MPT-2-16SDL		MPT-2-17S		MPT-2-17SDL		MPT-13-4		MPT-13-4DUP	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:											
CAS RN	Common name	µg/Kg Conc.	Qual.								
74-87-3	Chloromethane		11 U								
74-83-9	Bromomethane		11 U								
75-01-4	Vinyl chloride		11 U								
75-00-3	Chloroethane		11 U								
75-09-2	Methylene chloride		9 B		9 B		11 B		11 B		9 B
67-64-1	Acetone		6 BJ		6 BJ		5 BJ		5 BJ		62 B
75-15-0	Carbon disulfide		5 U		5 U		6 U		6 U		2 J
75-69-4	Trichlorofluoromethane		5 U		5 U		6 U		6 U		6 U
75-35-4	1,1-Dichloroethylene		5 U		5 U		6 U		6 U		6 U
75-34-3	1,1-Dichloroethane		5 U		5 U		6 U		6 U		6 U
540-59-0	1,2-Dichloroethene (total)		5 U		5 U		6 U		6 U		6 U
67-66-3	Chloroform		5 U		5 U		6 U		6 U		6 U
107-06-2	1,2-Dichloroethane		5 U		5 U		6 U		6 U		6 U
78-93-3	2-Butanone		12 B		12 B		11 BJ		11 BJ		13 B
71-55-6	1,1,1-Trichloroethane		5 U		5 U		6 U		6 U		6 U
56-23-5	Carbon tetrachloride		5 U		5 U		6 U		6 U		6 U
108-05-4	Vinyl acetate		11 U								
75-27-4	Bromodichloromethane		5 U		5 U		6 U		6 U		6 U
78-87-5	1,2-Dichloropropane		5 U		5 U		6 U		6 U		6 U
10061-01-5	cis-1,3-Dichloropropene		5 U		5 U		6 U		6 U		6 U
79-01-6	Trichloroethene		5 U		5 U		6 U		6 U		6 U
124-48-1	Dibromochloromethane		5 U		5 U		6 U		6 U		6 U
79-00-5	1,1,2-Trichloroethane		5 U		5 U		6 U		6 U		6 U
71-43-2	Benzene		5 U		5 U		6 U		6 U		6 U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-16SDL	MPT-2-17S	MPT-2-17SDL	MPT-13-4	MPT-13-4DUP
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
DATE SAMPLED:		20753	20753	20753	20753	20753
LAB NUMBER:		20753	20753	20753	20753	20753
CAS RN	Common name	µg/Kg Conc.				
		Qual.	Qual.	Qual.	Qual.	Qual.
10061-02-6	trans-1,3-Dichloropropene		5 U		6 U	6 U
110-75-8	2-Chloroethylvinylether		11 U		11 U	11 U
75-25-2	Bromoform		5 U		6 U	6 U
591-78-6	2-Hexanone		11 U		11 U	11 U
108-10-1	4-Methyl-2-Pentanone		11 U		11 U	11 U
127-18-4	Tetrachloroethene		5 U		6 U	6 U
79-34-5	1,1,2,2-Tetrachloroethane		5 U		6 U	6 U
108-88-3	Toluene		5 U		6 U	6 U
108-90-7	Chlorobenzene		5 U		6 U	6 U
100-41-4	Ethylbenzene		5 U		6 U	6 U
100-42-5	Styrene		5 U		6 U	6 U
1330-20-7	Xylene (total)		2 J		5 J	10 J
541-73-1	1,3-Dichlorobenzene		5 U		6 U	6 U
106-46-7	1,4-Dichlorobenzene		5 U		6 U	6 U
95-50-1	1,2-Dichlorobenzene		5 U		6 U	6 U
107-02-8	Acrolein		110 U		110 U	110 U
74-88-4	Iodomethane		11 U		11 U	11 U
107-13-1	Acrylonitrile		110 U		110 U	110 U
74-95-3	Dibromomethane		5 U		6 U	6 U
97-63-2	Ethyl Methacrylate		5 U		6 U	6 U
96-18-4	1,2,3-Trichloropropane		5 U		6 U	6 U
110-57-6	trans-1,4-Dichloro-2-butene		5 U		6 U	6 U
75-05-8	Acetonitrile		110 U		110 U	110 U
107-05-1	3-Chloropropene		5 U		6 U	6 U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:IMPTDAT7.WK1		MPT-2-16SDL	MPT-2-17S	MPT-2-17SDL	MPT-13-4	MPT-13-4DUP
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
DATE SAMPLED:		20753	20753	20753	20753	20753
LAB NUMBER:		20753	20753	20753	20753	20753
CAS RN	Common name	µg/Kg Conc.	µg/Kg Conc.	µg/Kg Conc.	µg/Kg Conc.	µg/Kg Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
107-12-0	Propionitrile		110		110	110
126-98-7	Methacrylonitrile		5		6	6
123-91-1	1,4-Dioxane		220		220	220
80-62-6	Methyl methacrylate		11		11	11
106-93-4	1,2-Dibromoethane		5		6	6
630-20-6	1,1,1,2-Tetrachloroethane		5		6	6
96-12-8	1,2-Dibromo-3-chloropropane		11		11	11
76-01-7	Pentachloroethane		11		11	11
78-83-1	Isobutyl alcohol		220		220	220
126-99-8	Chloroprene		220		220	220

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-13-5	MPT-13-6	MPT-13-6DL	MPT-22-1S	MPT-22-1SDL	
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	
DATE SAMPLED:		20753	20753	20753	20753	20753	
LAB NUMBER:		20753	20753	20753	20753	20753	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
74-87-3	Chloromethane	12	U	12	U	12	U
74-83-9	Bromomethane	12	U	12	U	12	U
75-01-4	Vinyl chloride	12	U	12	U	12	U
75-00-3	Chloroethane	12	U	12	U	12	U
75-09-2	Methylene chloride	25	B	42	B	8	B
67-64-1	Acetone	34	B	55	B	7	BJ
75-15-0	Carbon disulfide	6	U	6	U	6	U
75-69-4	Trichlorofluoromethane	36	U	6	U	6	U
75-35-4	1,1-Dichloroethylene	6	U	6	U	6	U
75-34-3	1,1-Dichloroethane	6	U	6	U	6	U
540-59-0	1,2-Dichloroethene (total)	6	U	6	U	6	U
67-66-3	Chloroform	6	U	6	U	6	U
107-06-2	1,2-Dichloroethane	6	U	6	U	6	U
78-93-3	2-Butanone	12	BJ	11	BJ	8	BJ
71-55-6	1,1,1-Trichloroethane	6	U	6	U	6	U
56-23-5	Carbon tetrachloride	6	U	6	U	6	U
108-05-4	Vinyl acetate	12	U	12	U	12	U
75-27-4	Bromodichloromethane	6	U	6	U	6	U
78-87-5	1,2-Dichloropropane	6	U	6	U	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U	6	U	6	U
79-01-6	Trichloroethene	6	U	6	U	6	U
124-48-1	Dibromochloromethane	6	U	6	U	6	U
79-00-5	1,1,2-Trichloroethane	6	U	6	U	6	U
71-43-2	Benzene	6	U	6	U	6	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-13-5		MPT-13-6		MPT-13-6DL		MPT-22-1S		MPT-22-1SDL	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
CAS RN	Common name	µg/Kg Conc.	Qual.								
10061-02-6	trans-1,3-Dichloropropene	6	U	6	U						
110-75-8	2-Chloroethylvinylether	12	U	12	U			12	U		
75-25-2	Bromoform	6	U	6	U			6	U		
591-78-6	2-Hexanone	12	U	12	U			12	U		
108-10-1	4-Methyl-2-Pentanone	12	U	12	U			12	U		
127-18-4	Tetrachloroethene	6	U	6	U			6	U		
79-34-5	1,1,2,2-Tetrachloroethane	6	U	6	U			6	U		
108-88-3	Toluene	6	U	6	U			6	U		
108-90-7	Chlorobenzene	6	U	6	U			6	U		
100-41-4	Ethylbenzene	6	U	6	U			6	U		
100-42-5	Styrene	6	U	6	U			6	U		
1330-20-7	Xylene (total)	3	J	6	U			6	U		
541-73-1	1,3-Dichlorobenzene	6	U	6	U			6	U		
106-46-7	1,4-Dichlorobenzene	6	U	6	U			6	U		
95-50-1	1,2-Dichlorobenzene	6	U	6	U			6	U		
107-02-8	Acrolein	120	U	120	U			120	U		
74-88-4	Iodomethane	12	U	12	U			12	U		
107-13-1	Acrylonitrile	120	U	120	U			120	U		
74-95-3	Dibromomethane	6	U	6	U			6	U		
97-63-2	Ethyl Methacrylate	6	U	6	U			6	U		
96-18-4	1,2,3-Trichloropropane	6	U	6	U			6	U		
110-57-6	trans-1,4-Dichloro-2-butene	6	U	6	U			6	U		
75-05-8	Acetonitrile	120	U	120	U			120	U		
107-05-1	3-Chloropropene	6	U	6	U			6	U		

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

CAS RN	Common name	MPT-13-5		MPT-13-6		MPT-13-6DL		MPT-22-1S		MPT-22-1SDL	
		µg/Kg Conc.	Qual.								
107-12-0	Propionitrile	120	U	120	U			120	U		
126-98-7	Methacrylonitrile	6	U	6	U			6	U		
123-91-1	1,4-Dioxane	240	U	250	U			250	U		
80-62-6	Methyl methacrylate	12	U	12	U			12	U		
106-93-4	1,2-Dibromoethane	6	U	6	U			6	U		
630-20-6	1,1,1,2-Tetrachloroethane	6	U	6	U			6	U		
96-12-8	1,2-Dibromo-3-chloropropane	12	U	12	U			12	U		
76-01-7	Pentachloroethane	12	U	12	U			12	U		
78-83-1	Isobutyl alcohol	250	U	250	U			250	U		
126-99-8	Chloroprene	250	U	250	U			250	U		

A:\MPTDAT7.WK1
 LOCATION:
 SAMPLE MATRIX:
 DATE SAMPLED:
 LAB NUMBER:

UNITS:

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-U-1		MPT-22-L-1		MPT-22-U-2		MPT-22-L-2		MPT-22-U-3	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		03/11/92		03/11/92		03/11/92		03/11/92		03/11/92	
DATE SAMPLED:		21171		21171		21171		21171		21171	
LAB NUMBER:		21171		21171		21171		21171		21171	
CAS RN	Common name	ug/Kg Conc.	Qual.								
74-87-3	Chloromethane	11	U	14	U	11	U	12	U	11	U
74-83-9	Bromomethane	11	U	14	U	11	U	12	U	11	U
75-01-4	Vinyl chloride	11	U	14	U	11	U	12	U	11	U
75-00-3	Chloroethane	11	U	14	U	11	U	12	U	11	U
75-09-2	Methylene chloride	12	B	25	B	12	B	15	B	9	B
67-64-1	Acetone	14	J	13	J	18	U	11	BJ	23	B
75-15-0	Carbon disulfide	5	U	7	U	6	U	6	U	6	U
75-69-4	Trichlorofluoromethane	5	U	7	U	6	U	6	U	6	U
75-35-4	1,1-Dichloroethylene	5	U	7	U	6	U	6	U	6	U
75-34-3	1,1-Dichloroethane	5	U	7	U	6	U	6	U	6	U
540-59-0	1,2-Dichloroethene (total)	5	U	7	U	6	U	6	U	6	U
67-66-3	Chloroform	3	BJ	3	BJ	2	BJ	2	BJ	2	BJ
107-06-2	1,2-Dichloroethane	5	U	7	U	6	U	6	U	6	U
78-93-3	2-Butanone	11	U	14	U	11	U	12	U	11	U
71-55-6	1,1,1-Trichloroethane	5	U	7	U	6	U	6	U	6	U
56-23-5	Carbon tetrachloride	5	U	7	U	6	U	6	U	6	U
108-05-4	Vinyl acetate	11	U	14	U	11	U	12	U	11	U
75-27-4	Bromodichloromethane	5	U	7	U	6	U	6	U	6	U
78-87-5	1,2-Dichloropropane	5	U	7	U	6	U	6	U	6	U
10061-01-5	cis-1,3-Dichloropropene	5	U	7	U	6	U	6	U	6	U
79-01-6	Trichloroethene	5	U	7	U	6	U	6	U	6	U
124-48-1	Dibromochloromethane	5	U	7	U	6	U	6	U	6	U
79-00-5	1,1,2-Trichloroethane	5	U	7	U	6	U	6	U	6	U
71-43-2	Benzene	5	U	7	U	6	U	6	U	6	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-U-1		MPT-22-L-1		MPT-22-U-2		MPT-22-L-2		MPT-22-U-3	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		03/11/92		03/11/92		03/11/92		03/11/92		03/11/92	
DATE SAMPLED:		21171		21171		21171		21171		21171	
LAB NUMBER:		21171		21171		21171		21171		21171	
UNITS:		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS RN	Common name	Conc.	Qual.								
10061-02-6	trans-1,3-Dichloropropene	5	U	7	U	6	U	6	U	6	U
110-75-8	2-Chloroethyvinylether	11	U	14	U	11	U	12	U	11	U
75-25-2	Bromoform	5	U	7	U	6	U	6	U	6	U
591-78-6	2-Hexanone	11	U	14	U	11	U	12	U	11	U
108-10-1	4-Methyl-2-Pentanone	11	U	14	U	11	U	12	U	11	U
127-18-4	Tetrachloroethene	5	U	7	U	6	U	6	U	6	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U	7	U	6	U	6	U	6	U
108-88-3	Toluene	5	U	7	U	6	U	6	U	6	U
108-90-7	Chlorobenzene	5	U	7	U	6	U	6	U	6	U
100-41-4	Ethylbenzene	5	U	7	U	6	U	6	U	6	U
100-42-5	Styrene	5	U	7	U	6	U	6	U	6	U
1330-20-7	Xylene (total)	5	U	7	U	6	U	6	U	6	U
541-73-1	1,3-Dichlorobenzene	5	U	7	U	6	U	6	U	6	U
106-46-7	1,4-Dichlorobenzene	5	U	7	U	6	U	6	U	6	U
95-50-1	1,2-Dichlorobenzene	5	U	7	U	6	U	6	U	6	U
107-02-8	Acrolein	110	U	140	U	110	U	120	U	110	U
74-88-4	Iodomethane	11	U	14	U	11	U	12	U	11	U
107-13-1	Acrylonitrile	110	U	140	U	110	U	120	U	110	U
74-95-3	Dibromomethane	5	U	7	U	6	U	6	U	6	U
97-63-2	Ethyl Methacrylate	5	U	7	U	6	U	6	U	6	U
96-18-4	1,2,3-Trichloropropane	5	U	7	U	6	U	6	U	6	U
110-57-6	trans-1,4-Dichloro-2-butene	5	U	7	U	6	U	6	U	6	U
75-05-8	Acetonitrile	110	U	140	U	110	U	120	U	110	U
107-05-1	3-Chloropropene	5	U	7	U	6	U	6	U	6	U

*Blank entries indicate that sample was not analyzed for that analyte group.

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-U-1	MPT-22-L-1	MPT-22-U-2	MPT-22-L-2	MPT-22-U-3
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171	21171
LAB NUMBER:						
CAS RN	Common name	ug/Kg Conc.				
		Qual.	Qual.	Qual.	Qual.	Qual.
107-12-0	Propionitrile	110 U	140 U	110 U	120 U	110 U
126-98-7	Methacrylonitrile	5 U	7 U	6 U	6 U	6 U
123-91-1	1,4-Dioxane	210 U	290 U	230 U	240 U	230 U
80-62-6	Methyl methacrylate	11 U	14 U	11 U	12 U	11 U
106-93-4	1,2-Dibromoethane	5 U	7 U	6 U	6 U	6 U
630-20-6	1,1,1,2-Tetrachloroethane	5 U	7 U	6 U	6 U	6 U
96-12-8	1,2-Dibromo-3-chloropropane	11 U	14 U	11 U	12 U	11 U
76-01-7	Pentachloroethane	11 U	14 U	11 U	12 U	11 U
78-83-1	Isobutyl alcohol	210 U	290 U	230 U	240 U	230 U
126-99-8	Chloroprene	210 U	290 U	230 U	240 U	230 U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:					
CAS RN	Common name	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.
74-87-3	Chloromethane	12 U	12 U	13 U	11 U
74-83-9	Bromomethane	12 U	12 U	13 U	11 U
75-01-4	Vinyl chloride	12 U	12 U	13 U	11 U
75-00-3	Chloroethane	12 U	12 U	13 U	11 U
75-09-2	Methylene chloride	15 B	18 B	27 B	12 B
67-64-1	Acetone	20 BJ	14	9 BJ	11 U
75-15-0	Carbon disulfide	2 J	6 U	6 U	5 U
75-69-4	Trichlorofluoromethane	6 U	6 U	6 U	5 U
75-35-4	1,1-Dichloroethylene	6 U	6 U	6 U	5 U
75-34-3	1,1-Dichloroethane	6 U	6 U	6 U	5 U
540-59-0	1,2-Dichloroethene (total)	6 U	6 U	6 U	5 U
67-66-3	Chloroform	1 BJ	3 BJ	2 BJ	2 BJ
107-06-2	1,2-Dichloroethane	6 U	6 U	6 U	5 U
78-93-3	2-Butanone	12 U	12 U	13 U	11 U
71-55-6	1,1,1-Trichloroethane	6 U	6 U	6 U	5 U
56-23-5	Carbon tetrachloride	6 U	6 U	6 U	5 U
108-05-4	Vinyl acetate	12 U	12 U	13 U	11 U
75-27-4	Bromodichloromethane	6 U	6 U	6 U	5 U
78-87-5	1,2-Dichloropropane	6 U	6 U	6 U	5 U
10061-01-5	cis-1,3-Dichloropropene	6 U	6 U	6 U	5 U
79-01-6	Trichloroethene	6 U	6 U	6 U	5 U
124-48-1	Dibromochloromethane	6 U	6 U	6 U	5 U
79-00-5	1,1,2-Trichloroethane	6 U	6 U	6 U	5 U
71-43-2	Benzene	6 U	6 U	6 U	5 U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
		SOIL	SOIL	SOIL	SOIL
		03/11/92	03/11/92	03/11/92	03/11/92
		21171	21171	21171	21171
A:\MPTDT11.WK1					
LOCATION:					
SAMPLE MATRIX:					
DATE SAMPLED:					
LAB NUMBER:					
CAS RN	Common name	ug/Kg Conc.	Qual.	ug/Kg Conc.	Qual.
10061-02-6	trans-1,3-Dichloropropene	6	U	6	U
110-75-8	2-Chloroethylvinylether	12	U	13	U
75-25-2	Bromoform	6	U	6	U
591-78-6	2-Hexanone	12	U	13	U
108-10-1	4-Methyl-2-Pentanone	12	U	13	U
127-18-4	Tetrachloroethene	6	U	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U	6	U
108-88-3	Toluene	6	U	6	U
108-90-7	Chlorobenzene	6	U	6	U
100-41-4	Ethylbenzene	6	U	6	U
100-42-5	Styrene	6	U	6	U
1330-20-7	Xylene (total)	6	U	6	U
541-73-1	1,3-Dichlorobenzene	6	U	6	U
106-46-7	1,4-Dichlorobenzene	6	U	6	U
95-50-1	1,2-Dichlorobenzene	6	U	6	U
107-02-8	Acrolein	120	U	130	U
74-88-4	Iodomethane	12	U	13	U
107-13-1	Acrylonitrile	120	U	130	U
74-95-3	Dibromomethane	6	U	6	U
97-63-2	Ethyl Methacrylate	6	U	6	U
96-18-4	1,2,3-Trichloropropane	6	U	6	U
110-57-6	trans-1,4-Dichloro-2-butene	6	U	6	U
75-05-8	Acetonitrile	120	U	130	U
107-05-1	3-Chloropropene	6	U	6	U

*Blank entries indicate that sample was not analyzed for that analyte group

VOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTD11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:					
CAS RN	Common name	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.
		Qual.	Qual.	Qual.	Qual.
107-12-0	Propionitrile	120 U	120 U	130 U	110 U
126-98-7	Methacrylonitrile	6 U	6 U	6 U	5 U
123-91-1	1,4-Dioxane	240 U	240 U	250 U	210 U
80-62-6	Methyl methacrylate	12 U	12 U	13 U	11 U
106-93-4	1,2-Dibromoethane	6 U	6 U	6 U	5 U
630-20-6	1,1,1,2-Tetrachloroethane	6 U	6 U	6 U	5 U
96-12-8	1,2-Dibromo-3-chloropropane	12 U	12 U	13 U	11 U
76-01-7	Pentachloroethane	12 U	12 U	13 U	11 U
78-83-1	Isobutyl alcohol	240 U	240 U	250 U	210 U
126-99-8	Chloroprene	240 U	240 U	250 U	210 U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-11S	MPT-2-11SDL	MPT-2-12S	MPT-2-12SDL	MPT-2-16S
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
DATE SAMPLED:		20753	20753	20753	20753	20753
LAB NUMBER:		20753	20753	20753	20753	20753
UNITS:		µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.
62-75-9	N-Nitrosodimethylamine	380	U	410	U	400
108-95-2	Phenol	380	U	410	U	400
62-53-3	Aniline	380	U	410	U	400
111-44-4	bis(2-Chloroethyl)Ether	380	U	410	U	400
95-57-8	2-Chlorophenol	380	U	410	U	400
541-73-1	1,3-Dichlorobenzene	380	U	410	U	400
106-46-7	1,4-Dichlorobenzene	380	U	410	U	400
100-51-6	Benzyl alcohol	380	U	410	U	400
95-50-1	1,2-Dichlorobenzene	380	U	410	U	400
95-48-7	2-Methylphenol	380	U	410	U	400
39638-32-9	bis(2-chloroethyl)Ether	380	U	410	U	400
106-44-5	4-Methylphenol	380	U	410	U	400
621-64-7	N-Nitroso-Di-n-Propylamine	380	U	410	U	400
67-72-1	Hexachloroethane	380	U	410	U	400
98-95-3	Nitrobenzene	380	U	410	U	400
78-59-1	Isophorone	380	U	410	U	400
88-75-5	2-Nitrophenol	380	U	410	U	400
105-67-9	2,4-Dimethylphenol	380	U	410	U	400
65-75-0	Benzoic Acid	1900	U	2000	U	1900
111-91-1	Bis(2-chloroethoxy)methane	380	U	410	U	400
120-83-2	2,4-Dichlorophenol	380	U	410	U	400
120-82-1	1,2,4-Trichlorobenzene	380	U	410	U	400
91-20-3	Naphthalene	380	U	410	U	400
106-47-8	4-Chloroaniline	380	U	410	U	400

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-11S	MPT-2-11SDL	MPT-2-12S	MPT-2-12SDL	MPT-2-16S	
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	
DATE SAMPLED:		20753	20753	20753	20753	20753	
LAB NUMBER:		20753	20753	20753	20753	20753	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
87-68-3	Hexachlorobutadiene	380	U	410	U	400	U
59-50-7	4-Chloro-3-Methylphenol	380	U	410	U	400	U
91-57-6	2-Methylnaphthalene	380	U	410	U	400	U
77-47-4	Hexachlorocyclopentadiene	380	U	410	U	400	U
88-06-2	2,4,6-Trichlorophenol	380	U	410	U	400	U
95-95-4	2,4,5-Trichlorophenol	1900	U	2000	U	1900	U
91-58-7	2-Chloronaphthalene	380	U	410	U	400	U
88-74-4	2-Nitroaniline	1900	U	2000	U	1900	U
131-11-3	Dimethyl phthalate	380	U	410	U	400	U
208-96-8	Acenaphthylene	380	U	410	U	400	U
606-20-2	2,6-Dinitrotoluene	380	U	410	U	400	U
99-09-2	3-Nitroaniline	1900	U	2000	U	1900	U
83-32-9	Acenaphthene	380	U	410	U	400	U
51-28-5	2,4-Dinitrophenol	1900	U	2000	U	1900	U
100-02-7	4-Nitrophenol	1900	U	2000	U	1900	U
132-64-9	Dibenzofuran	380	U	410	U	400	U
121-14-2	2,4-Dinitrotoluene	380	U	410	U	400	U
84-66-2	Diethyl phthalate	380	U	410	U	400	U
7005-72-3	4-Chlorophenyl phenyl ether	380	U	410	U	400	U
86-73-7	Fluorene	380	U	410	U	400	U
100-10-6	4-Nitroaniline	1900	U	2000	U	1900	U
534-52-1	4,6-Dinitro-2-Methylphenol	1900	U	2000	U	1900	U
86-30-6	N-Nitrosodiphenylamine	380	U	410	U	400	U
122-66-7	1,2-Diphenylhydrazine	380	U	410	U	400	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-11S		MPT-2-11SDL		MPT-2-12S		MPT-2-12SDL		MPT-2-16S	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
CAS RN	Common name	µg/Kg Conc.	Qual.								
101-55-3	4-Bromophenyl phenyl ether	380	U			410	U			400	U
118-74-1	Hexachlorobenzene	380	U			410	U			400	U
87-86-5	Pentachlorophenol	1900	BU			2000	BU			1900	BU
85-01-8	Phenanthrene	380	U			410	U			400	U
120-12-7	Anthracene	380	U			410	U			400	U
84-74-2	Di-n-butyl phthalate	380	BU			410	BU			400	BU
206-44-0	Fluoranthene	380	U			410	U			400	U
129-00-0	Pyrene	380	U			410	U			400	U
85-68-7	Butyl benzyl phthalate	380	U			410	U			400	U
91-94-1	3,3'-Dichlorobenzidine	770	U			810	U			800	U
56-55-3	Benzo[a]anthracene	380	U			410	U			400	U
218-01-9	Chrysene	380	U			410	U			400	U
117-81-7	Bis(2-ethylhexyl) phthalate	380	BU			53	BJ			400	BU
117-84-0	Di-n-octyl phthalate	380	U			410	U			400	U
205-99-2	Benzo[b]fluoranthene	380	U			410	U			400	U
207-08-9	Benzo[k]fluoranthene	380	U			410	U			400	U
50-32-8	Benzo[a]pyrene	380	U			410	U			400	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U			410	U			400	U
53-70-3	Dibenz[a,h]anthracene	380	U			410	U			400	U
191-24-2	Benzo[ghi]perylene	380	U			410	U			400	U
109-06-8	2-Picoline	1900	U			2000	U			1900	U
66-27-3	Methyl methanesulfonate	380	U			410	U			400	U
62-50-0	Ethyl methanesulfonate	380	U			410	U			400	U
98-86-2	Acetophenone	380	U			410	U			400	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-11S		MPT-2-11SDL		MPT-2-12S		MPT-2-12SDL		MPT-2-16S	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:											
CAS RN	Common name	µg/Kg Conc.	Qual.								
100-75-4	N-Nitrosopiperidine	380	U			410	U			400	U
122-09-8	Phenyl-tert-butylamine	1900	U			2000	U			1900	U
87-65-0	2,6-Dichlorophenol	380	U			410	U			400	U
924-16-3	N-Nitrosodi-n-butylamine	380	U			410	U			400	U
55-18-5	N-Nitrosodimethylamine	380	U			410	U			400	U
930-55-2	N-Nitrosopyrrolidine	380	U			410	U			400	U
92-87-5	Benzidine	1900	U			2000	U			1900	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1900	U			2000	U			1900	U
608-93-5	Pentachlorobenzene	1900	U			2000	U			1900	U
134-32-7	1-Naphthylamine	1900	U			2000	U			1900	U
91-59-8	2-Naphthylamine	1900	U			2000	U			1900	U
58-90-2	2,3,4,6-Tetrachlorophenol	380	U			410	U			400	U
122-39-4	Diphenylamine	380	U			410	U			400	U
62-44-2	Phenacetin	380	U			410	U			400	U
92-67-1	4-Aminobiphenyl	1900	U			2000	U			1900	U
82-68-8	Pentachloronitrobenzene	1900	U			2000	U			1900	U
23950-58-5	Pronamide	380	U			410	U			400	U
60-11-7	p-(Dimethylamino)azobenzene	380	U			410	U			400	U
57-97-6	7,12-Dimethylbenz[<i>a</i>]anthracene	380	U			410	U			400	U
56-49-5	Methylcholanthrene	380	U			410	U			400	U
110-86-1	Pyridine	1900	U			2000	U			1900	U
10595-95-6	N-Nitrosomethylamine	380	U			410	U			400	U
59-89-2	N-Nitrosomorpholine	380	U			410	U			400	U
95-53-4	o-Toluidine	380	U			410	U			400	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-11S	MPT-2-11SDL	MPT-2-12S	MPT-2-12SDL	MPT-2-16S	
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	
DATE SAMPLED:		20753	20753	20753	20753	20753	
LAB NUMBER:		20753	20753	20753	20753	20753	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
108-39-4	3-Methylphenol	380	U	410	U	400	U
1888-71-7	Hexachloropropene	1900	U	2000	U	1900	U
106-50-3	p-Phenylenediamine	1900	U	2000	U	1900	U
94-59-7	Safrole	1900	U	2000	U	1900	U
120-58-1	Isosafrole	1900	U	2000	U	1900	U
130-15-4	1,4-Naphthoquinone	1900	U	2000	U	1900	U
99-65-0	1,3-Dinitrobenzene	380	U	410	U	400	U
99-55-8	5-Nitro-o-toluidine	380	U	410	U	400	U
99-35-4	1,3,5-Trinitrobenzene	380	U	410	U	400	U
56-57-5	4-Nitroquinoline 1-oxide	380	U	410	U	400	U
91-80-5	Methapyrene	1900	U	2000	U	1900	U
119-93-7	3,3'-Dimethylbenzidine	380	U	410	U	400	U
53-96-3	2-Acetylaminofluorene	380	U	410	U	400	U
70-30-4	Hexachlorophene	1900	U	2000	U	1900	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-16SDL	MPT-2-17S	MPT-2-17SDL	MPT-13-4	MPT-13-4DUP	
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	
DATE SAMPLED:		20753	20753	20753	20753	20753	
LAB NUMBER:		20753	20753	20753	20753	20753	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
62-75-9	N-Nitrosodimethylamine						
108-95-2	Phenol	360	U			370	U
62-53-3	Aniline	360	U			370	U
111-44-4	bis(2-Chloroethyl)Ether	360	U			370	U
95-57-8	2-Chlorophenol	360	U			370	U
541-73-1	1,3-Dichlorobenzene	360	U			370	U
106-46-7	1,4-Dichlorobenzene	360	U			370	U
100-51-6	Benzyl alcohol	360	U			370	U
95-50-1	1,2-Dichlorobenzene	360	U			370	U
95-48-7	2-Methylphenol	360	U			370	U
39638-32-9	bis(2-chloroethyl)Ether	360	U			370	U
106-44-5	4-Methylphenol	360	U			370	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U			370	U
67-72-1	Hexachloroethane	360	U			370	U
98-95-3	Nitrobenzene	360	U			370	U
78-59-1	Isopharone	360	U			370	U
88-75-5	2-Nitrophenol	360	U			370	U
105-67-9	2,4-Dimethylphenol	360	U			370	U
65-75-0	Benzoic Acid	1700	U			1800	U
111-91-1	Bis(2-chloroethoxy)methane	360	U			370	U
120-83-2	2,4-Dichlorophenol	360	U			370	U
120-82-1	1,2,4-Trichlorobenzene	360	U			370	U
91-20-3	Naphthalene	360	U			370	U
106-47-8	4-Chloroaniline	360	U			370	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-16SDL		MPT-2-17S		MPT-2-17SDL		MPT-13-4		MPT-13-4DUP	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:											
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
87-68-3	Hexachlorobutadiene										
59-50-7	4-Chloro-3-Methylphenol			360	U					370	U
91-57-6	2-Methylnaphthalene			360	U					370	U
77-47-4	Hexachlorocyclopentadiene			360	U					370	U
88-06-2	2,4,6-Trichlorophenol			360	U					370	U
95-95-4	2,4,5-Trichlorophenol			1700	U					1800	U
91-58-7	2-Chloronaphthalene			360	U					370	U
88-74-4	2-Nitroaniline			1700	U					1800	U
131-11-3	Dimethyl phthalate			360	U					370	U
208-96-8	Acenaphthylene			360	U					370	U
606-20-2	2,6-Dinitrotoluene			360	U					370	U
99-09-2	3-Nitroaniline			1700	U					1800	U
83-32-9	Acenaphthene			360	U					370	U
51-28-5	2,4-Dinitrophenol			1700	U					1800	U
100-02-7	4-Nitrophenol			1700	U					1800	U
132-64-9	Dibenzofuran			360	U					370	U
121-14-2	2,4-Dinitrotoluene			360	U					370	U
84-66-2	Diethyl phthalate			360	U					370	U
7005-72-3	4-Chlorophenyl phenyl ether			360	U					370	U
86-73-7	Fluorene			360	U					370	U
100-10-6	4-Nitroaniline			1700	U					1800	U
534-52-1	4,6-Dinitro-2-Methylphenol			1700	U					1800	U
86-30-6	N-Nitrosodiphenylamine			360	U					370	U
122-66-7	1,2-Diphenylhydrazine			360	U					370	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-16SDL		MPT-2-17S		MPT-2-17SDL		MPT-13-4		MPT-13-4DUP	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether										
118-74-1	Hexachlorobenzene										
87-86-5	Pentachlorophenol										
85-01-8	Phenanthrene										
120-12-7	Anthracene										
84-74-2	Di-n-butyl phthalate										
206-44-0	Fluoranthene										
129-00-0	Pyrene										
85-68-7	Butyl benzyl phthalate										
91-94-1	3,3'-Dichlorobenzidine										
56-55-3	Benzo[a]anthracene										
218-01-9	Chrysene										
117-81-7	Bis(2-ethylhexyl) phthalate										
117-84-0	Di-n-octyl phthalate										
205-99-2	Benzo[b]fluoranthene										
207-08-9	Benzo[k]fluoranthene										
50-32-8	Benzo[a]pyrene										
193-39-5	Indeno(1,2,3-cd)pyrene										
53-70-3	Dibenz[a,h]anthracene										
191-24-2	Benzo[ghi]perylene										
109-06-8	2-Picoline										
66-27-3	Methyl methanesulfonate										
62-50-0	Ethyl methanesulfonate										
98-86-2	Acetophenone										

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT17.WK1		MPT-2-16SDL		MPT-2-17S		MPT-2-17SDL		MPT-13-4		MPT-13-4DUP	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
CAS RN	Common name	µg/Kg Conc.	Qual.								
100-75-4	N-Nitrosopiperidine										
122-09-8	Phenyl-tert-butylamine			360	U			370	U		370
87-65-0	2,6-Dichlorophenol			1700	U			1800	U		1800
924-16-3	N-Nitrosodi-n-butylamine			360	U			370	U		370
55-18-5	N-Nitrosodiethylamine			360	U			370	U		370
930-55-2	N-Nitrosopyrrolidine			360	U			370	U		370
92-87-5	Benzidine			360	U			370	U		370
95-94-3	1,2,4,5-Tetrachlorobenzene			1700	U			1800	U		1800
608-93-5	Pentachlorobenzene			1700	U			1800	U		1800
134-32-7	1-Naphthylamine			1700	U			1800	U		1800
91-59-8	2-Naphthylamine			1700	U			1800	U		1800
58-90-2	2,3,4,6-Tetrachlorophenol			1700	U			1800	U		1800
122-39-4	Diphenylamine			360	U			370	U		370
62-44-2	Phenacetin			360	U			370	U		370
92-67-1	4-Aminobiphenyl			360	U			370	U		370
82-68-8	Pentachloronitrobenzene			1700	U			1800	U		1800
23950-58-5	Pronamide			1700	U			1800	U		1800
60-11-7	p-(Dimethylamino)azobenzene			360	U			370	U		370
57-97-6	7,12-Dimethylbenz[a]anthracene			360	U			370	U		370
56-49-5	Methylcholanthrene			360	U			370	U		370
110-86-1	Pyridine			360	U			370	U		370
10595-95-6	N-Nitrosomethylethylamine			1700	U			1800	U		1800
59-89-2	N-Nitrosomorpholine			360	U			370	U		370
95-53-4	o-Toluidine			360	U			370	U		370

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-2-16SDL	MPT-2-17S	MPT-2-17SDL	MPT-13-4	MPT-13-4DUP
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
DATE SAMPLED:		20753	20753	20753	20753	20753
LAB NUMBER:						
UNITS:		µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
CAS RN	Common name	Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
108-39-4	3-Methylphenol		360	U	370	U
1888-71-7	Hexachloropropene		1700	U	1800	U
106-50-3	p-Phenylenediamine		1700	U	1800	U
94-59-7	Safrole		1700	U	1800	U
120-58-1	Isosafrole		1700	U	1800	U
130-15-4	1,4-Naphthoquinone		1700	U	1800	U
99-65-0	1,3-Dinitrobenzene		360	U	370	U
99-55-8	5-Nitro-o-toluidine		360	U	370	U
99-35-4	1,3,5-Trinitrobenzene		360	U	370	U
56-57-5	4-Nitroquinoline 1-oxide		360	U	370	U
91-80-5	Methapyrilene		1700	U	1800	U
119-93-7	3,3'-Dimethylbenzidine		360	U	370	U
53-96-3	2-Acetylaminofluorene		360	U	370	U
70-30-4	Hexachlorophene		1700	U	1800	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-13-5	MPT-13-6	MPT-13-6DL	MPT-22-1S	MPT-22-1SDL
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
DATE SAMPLED:		20753	20753	20753	20753	20753
LAB NUMBER:		20753	20753	20753	20753	20753
CAS RN	Common name	µg/Kg Conc.				
		Qual.	Qual.	Qual.	Qual.	Qual.
62-75-9	N-Nitrosodimethylamine	400 U	400 U		480 U	
108-95-2	Phenol	400 U	400 U		480 U	
62-53-3	Aniline	400 U	400 U		480 U	
111-44-4	bis(2-Chloroethyl)Ether	400 U	400 U		480 U	
95-57-8	2-Chlorophenol	400 U	400 U		480 U	
541-73-1	1,3-Dichlorobenzene	400 U	400 U		480 U	
106-46-7	1,4-Dichlorobenzene	400 U	400 U		480 U	
100-51-6	Benzyl alcohol	400 U	400 U		480 U	
95-50-1	1,2-Dichlorobenzene	400 U	400 U		480 U	
95-48-7	2-Methylphenol	400 U	400 U		480 U	
39638-32-9	bis(2-chloroethyl)Ether	400 U	400 U		480 U	
106-44-5	4-Methylphenol	400 U	400 U		480 U	
621-64-7	N-Nitroso-Di-n-Propylamine	400 U	400 U		480 U	
67-72-1	Hexachloroethane	400 U	400 U		480 U	
98-95-3	Nitrobenzene	400 U	400 U		480 U	
78-59-1	Isophorone	400 U	400 U		480 U	
88-75-5	2-Nitrophenol	400 U	400 U		480 U	
105-67-9	2,4-Dimethylphenol	400 U	400 U		480 U	
65-75-0	Benzoic Acid	2000 U	2000 U		2300 U	
111-91-1	Bis(2-chloroethoxy)methane	400 U	400 U		480 U	
120-83-2	2,4-Dichlorophenol	400 U	400 U		480 U	
120-82-1	1,2,4-Trichlorobenzene	400 U	400 U		480 U	
91-20-3	Naphthalene	400 U	400 U		480 U	
106-47-8	4-Chloroaniline	400 U	400 U		480 U	

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-13-5		MPT-13-6		MPT-13-6DL		MPT-22-1S		MPT-22-1SDL	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
87-68-3	Hexachlorobutadiene	400	U	400	U			480	U		
59-50-7	4-Chloro-3-Methylphenol	400	U	400	U			480	U		
91-57-6	2-Methylnaphthalene	400	U	400	U			480	U		
77-47-4	Hexachlorocyclopentadiene	400	U	400	U			480	U		
88-06-2	2,4,6-Trichlorophenol	400	U	400	U			480	U		
95-95-4	2,4,5-Trichlorophenol	2000	U	2000	U			2300	U		
91-58-7	2-Chloronaphthalene	400	U	400	U			480	U		
88-74-4	2-Nitroaniline	2000	U	2000	U			2300	U		
131-11-3	Dimethyl phthalate	400	U	400	U			480	U		
208-96-8	Acenaphthylene	400	U	400	U			480	U		
606-20-2	2,6-Dinitrotoluene	400	U	400	U			480	U		
99-09-2	3-Nitroaniline	2000	U	2000	U			2300	U		
83-32-9	Acenaphthene	400	U	400	U			480	U		
51-28-5	2,4-Dinitrophenol	2000	U	2000	U			2300	U		
100-02-7	4-Nitrophenol	2000	U	2000	U			2300	U		
132-64-9	Dibenzofuran	400	U	400	U			480	U		
121-14-2	2,4-Dinitrotoluene	400	U	400	U			480	U		
84-66-2	Diethyl phthalate	400	U	400	U			480	U		
7005-72-3	4-Chlorophenyl phenyl ether	400	U	400	U			480	U		
86-73-7	Fluorene	400	U	400	U			480	U		
100-10-6	4-Nitroaniline	2000	U	2000	U			2300	U		
594-52-1	4,6-Dinitro-2-Methylphenol	2000	U	2000	U			2300	U		
86-30-6	N-Nitrosodiphenylamine	400	U	400	U			480	U		
122-66-7	1,2-Diphenylhydrazine	400	U	400	U			480	U		

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

CAS RN	Common name	MPT-13-5		MPT-13-6		MPT-13-6DL		MPT-22-1S		MPT-22-1SDL	
		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
		20753	20753	20753	20753	20753	20753	20753	20753	20753	20753
		400	400	400	400	400	400	480	480	480	480
		Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.	Qual.	Qual.	Qual.	Qual.	Qual.
		µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
101-55-3	4-Bromophenyl phenyl ether	400	U	400	U						
118-74-1	Hexachlorobenzene	400	U	400	U						
87-86-5	Pentachlorophenol	160	BJ	1900	BU						
85-01-8	Phenanthrene	400	U	400	U						
120-12-7	Anthracene	400	U	400	U						
84-74-2	Di-n-butyl phthalate	400	BU	400	BU						
206-44-0	Fluoranthene	400	U	400	U						
129-00-0	Pyrene	42	J	400	U						
85-68-7	Butyl benzyl phthalate	400	U	400	U						
91-94-1	3,3'-Dichlorobenzidine	800	U	800	U						
56-55-3	Benzo[a]anthracene	400	U	400	U						
218-01-9	Chrysene	400	U	400	U						
117-81-7	Bis(2-ethylhexyl) phthalate	76	BJ	95	BJ						
117-84-0	Di-n-octyl phthalate	400	U	400	U						
205-99-2	Benzo[b]fluoranthene	400	U	400	U						
207-08-9	Benzo[k]fluoranthene	400	U	400	U						
50-32-8	Benzo[a]pyrene	400	U	400	U						
193-39-5	Indeno(1,2,3-cd)pyrene	400	U	400	U						
53-70-3	Dibenz[a,h]anthracene	400	U	400	U						
191-24-2	Benzo[ghi]perylene	400	U	400	U						
109-06-8	2-Picoline	2000	U	2000	U						
66-27-3	Methyl methanesulfonate	400	U	400	U						
62-50-0	Ethyl methanesulfonate	400	U	400	U						
98-86-2	Acetophenone	400	U	400	U						

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-13-5		MPT-13-6		MPT-13-6DL		MPT-22-1S		MPT-22-1SDL	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
100-75-4	N-Nitrosopiperidine	400	U	400	U			480	U		
122-09-8	Phenyl-tert-butylamine	2000	U	2000	U			2300	U		
87-65-0	2,6-Dichlorophenol	400	U	400	U			480	U		
924-16-3	N-Nitrosodi-n-butylamine	400	U	400	U			480	U		
55-18-5	N-Nitrosodiethylamine	400	U	400	U			480	U		
930-55-2	N-Nitrosopyrrolidine	400	U	400	U			480	U		
92-87-5	Benzidine	2000	U	2000	U			2300	U		
95-94-3	1,2,4,5-Tetrachlorobenzene	2000	U	2000	U			2300	U		
608-93-5	Pentachlorobenzene	2000	U	2000	U			2300	U		
134-32-7	1-Naphthylamine	2000	U	2000	U			2300	U		
91-59-8	2-Naphthylamine	2000	U	2000	U			2300	U		
58-90-2	2,3,4,6-Tetrachlorophenol	400	U	400	U			480	U		
122-39-4	Diphenylamine	400	U	400	U			480	U		
62-44-2	Phenacetin	400	U	400	U			480	U		
92-67-1	4-Aminobiphenyl	400	U	400	U			480	U		
82-68-8	Pentachloronitrobenzene	2000	U	2000	U			2300	U		
23950-58-5	Pronamide	2000	U	2000	U			2300	U		
60-11-7	p-(Dimethylamino)azobenzene	400	U	400	U			480	U		
57-97-6	7,12-Dimethylbenz[a]anthracene	400	U	400	U			480	U		
56-49-5	Methylcholanthrene	400	U	400	U			480	U		
110-86-1	Pyridine	2000	U	2000	U			2300	U		
10595-95-6	N-Nitrosomethylethylamine	400	U	400	U			480	U		
59-89-2	N-Nitrosomorpholine	400	U	400	U			480	U		
95-53-4	o-Toluidine	400	U	400	U			480	U		

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDAT7.WK1		MPT-13-5		MPT-13-6		MPT-13-6DL		MPT-22-1S		MPT-22-1SDL	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
108-39-4	3-Methylphenol	400	U	400	U			480	U		
1888-71-7	Hexachloropropene	2000	U	2000	U			2300	U		
106-50-3	p-Phenylenediamine	2000	U	2000	U			2300	U		
94-59-7	Safrole	2000	U	2000	U			2300	U		
120-58-1	Isosafrole	2000	U	2000	U			2300	U		
130-15-4	1,4-Naphthoquinone	2000	U	2000	U			2300	U		
99-65-0	1,3-Dinitrobenzene	400	U	400	U			480	U		
99-55-8	5-Nitro-o-toluidine	400	U	400	U			480	U		
99-35-4	1,3,5-Trinitrobenzene	400	U	400	U			480	U		
56-57-5	4-Nitroquinoline 1-oxide	400	U	400	U			480	U		
91-80-5	Methapyriene	2000	U	2000	U			2300	U		
119-93-7	3,3'-Dimethylbenzidine	400	U	400	U			480	U		
53-96-3	2-Acetylaminofluorene	400	U	400	U			480	U		
70-30-4	Hexachlorophene	2000	U	2000	U			480	U		

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-U-1	MPT-22-L-1	MPT-22-U-2	MPT-22-L-2	MPT-22-U-3
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171	21171
LAB NUMBER:						
CAS RN	Common name	ug/Kg Conc.				
		Qual.	Qual.	Qual.	Qual.	Qual.
62-75-9	N-Nitrosodimethylamine	360 U	470 U	380 U	390 U	370 U
108-95-2	Phenol	360 U	470 U	380 U	390 U	370 U
62-53-3	Aniline	360 U	470 U	380 U	390 U	370 U
111-44-4	bis(2-Chloroethyl)Ether	360 U	470 U	380 U	390 U	370 U
95-57-8	2-Chlorophenol	360 U	470 U	380 U	390 U	370 U
541-73-1	1,3-Dichlorobenzene	360 U	470 U	380 U	390 U	370 U
106-46-7	1,4-Dichlorobenzene	360 U	470 U	380 U	390 U	370 U
100-51-6	Benzyl alcohol	360 U	470 U	380 U	390 U	370 U
95-50-1	1,2-Dichlorobenzene	360 U	470 U	380 U	390 U	370 U
95-48-7	2-Methylphenol	360 U	470 U	380 U	390 U	370 U
39638-32-9	bis(2-chloroethyl)Ether	360 U	470 U	380 U	390 U	370 U
106-44-5	4-Methylphenol	360 U	470 U	380 U	390 U	370 U
621-64-7	N-Nitroso-Di-n-Propylamine	360 U	470 U	380 U	390 U	370 U
67-72-1	Hexachloroethane	360 U	470 U	380 U	390 U	370 U
98-95-3	Nitrobenzene	360 U	470 U	380 U	390 U	370 U
78-59-1	Isophorone	360 U	470 U	380 U	390 U	370 U
88-75-5	2-Nitrophenol	360 U	470 U	380 U	390 U	370 U
105-67-9	2,4-Dimethylphenol	360 U	470 U	380 U	390 U	370 U
65-85-0	Benzoic Acid	1700 U	2300 U	1800 U	1900 U	1800 U
111-91-1	Bis(2-chloroethoxy)methane	360 U	470 U	380 U	390 U	370 U
120-83-2	2,4-Dichlorophenol	360 U	470 U	380 U	390 U	370 U
120-82-1	1,2,4-Trichlorobenzene	360 U	470 U	380 U	390 U	370 U
91-20-3	Naphthalene	360 U	470 U	380 U	390 U	370 U
106-47-8	4-Chloroaniline	360 U	470 U	380 U	390 U	370 U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:IMPTDT11.WK1		MPT-22-U-1		MPT-22-L-1		MPT-22-U-2		MPT-22-L-2		MPT-22-U-3	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		03/11/92		03/11/92		03/11/92		03/11/92		03/11/92	
DATE SAMPLED:		21171		21171		21171		21171		21171	
LAB NUMBER:		21171		21171		21171		21171		21171	
CAS RN	Common name	ug/Kg Conc.	Qual.								
87-68-3	Hexachlorobutadiene	360	U	470	U	380	U	390	U	370	U
59-50-7	4-Chloro-3-Methylphenol	360	U	470	U	380	U	390	U	370	U
91-57-6	2-Methylnaphthalene	360	U	470	U	380	U	390	U	370	U
77-47-4	Hexachlorocyclopentadiene	360	U	470	U	380	U	390	U	370	U
88-06-2	2,4,6-Trichlorophenol	360	U	470	U	380	U	390	U	370	U
95-95-4	2,4,5-Trichlorophenol	1700	U	2300	U	1800	U	1900	U	1800	U
91-58-7	2-Chloronaphthalene	360	U	470	U	380	U	390	U	370	U
88-74-4	2-Nitroaniline	1700	U	2300	U	1800	U	1900	U	1800	U
131-11-3	Dimethyl phthalate	360	U	470	U	380	U	390	U	370	U
208-96-8	Acenaphthylene	360	U	470	U	380	U	390	U	370	U
606-20-2	2,6-Dinitrotoluene	360	U	470	U	380	U	390	U	370	U
99-09-2	3-Nitroaniline	1700	U	2300	U	1800	U	1900	U	1800	U
83-32-9	Acenaphthene	360	U	470	U	380	U	390	U	370	U
51-28-5	2,4-Dinitrophenol	1700	U	2300	U	1800	U	1900	U	1800	U
100-02-7	4-Nitrophenol	1700	U	2300	U	1800	U	1900	U	1800	U
132-64-9	Dibenzofuran	360	U	470	U	380	U	390	U	370	U
121-14-2	2,4-Dinitrotoluene	360	U	470	U	380	U	390	U	370	U
84-66-2	Diethyl phthalate	360	U	470	U	380	U	390	U	370	U
7005-72-3	4-Chlorophenyl phenyl ether	360	U	470	U	380	U	390	U	370	U
86-73-7	Fluorene	360	U	470	U	380	U	390	U	370	U
100-10-6	4-Nitroaniline	1700	U	2300	U	1800	U	1900	U	1800	U
534-52-1	4,6-Dinitro-2-Methylphenol	1700	U	2300	U	1800	U	1900	U	1800	U
86-30-6	N-Nitrosodiphenylamine	360	U	470	U	380	U	390	U	370	U
122-66-7	1,2-Diphenylhydrazine	360	U	470	U	380	U	390	U	370	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-U-1	MPT-22-L-1	MPT-22-U-2	MPT-22-L-2	MPT-22-U-3
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171	21171
LAB NUMBER:						
UNITS:		ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
CAS RN	Common name	Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
101-55-3	4-Bromophenyl phenyl ether	360	470	380	390	370
118-74-1	Hexachlorobenzene	360	470	380	390	370
87-86-5	Pentachlorophenol	1700	2300	1800	1900	1800
85-01-8	Phenanthrene	360	470	380	390	370
120-12-7	Anthracene	360	470	380	390	370
84-74-2	Di-n-butyl phthalate	360	470	380	390	370
206-44-0	Fluoranthene	360	470	380	390	370
129-00-0	Pyrene	360	470	380	390	370
85-68-7	Butyl benzyl phthalate	360	470	380	390	370
91-94-1	3,3'-Dichlorobenzidine	720	940	760	790	750
56-55-3	Benzofluoranthene	360	470	380	390	370
218-01-9	Chrysene	360	470	380	390	370
117-81-7	Bis(2-ethylhexyl) phthalate	53	200	88	140	67
117-84-0	Di-n-octyl phthalate	360	470	380	390	370
205-99-2	Benzo[b]fluoranthene	360	470	380	390	370
207-08-9	Benzo[k]fluoranthene	360	470	380	390	370
50-32-8	Benzo[a]pyrene	360	70	380	390	370
193-39-5	Indeno(1,2,3-cd)pyrene	360	470	380	390	370
53-70-3	Dibenz[a,h]anthracene	360	470	380	390	370
191-24-2	Benzo[ghi]perylene	360	470	380	390	370
109-06-8	2-Picoline	1700	2300	1800	1900	1800
66-27-3	Methyl methanesulfonate	360	470	380	390	370
62-50-0	Ethyl methanesulfonate	360	470	380	390	370
98-86-2	Acetophenone	360	470	380	390	370

* Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-U-1		MPT-22-L-1		MPT-22-U-2		MPT-22-L-2		MPT-22-U-3	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		03/11/92		03/11/92		03/11/92		03/11/92		03/11/92	
DATE SAMPLED:		21171		21171		21171		21171		21171	
LAB NUMBER:		21171		21171		21171		21171		21171	
CAS RN	Common name	ug/Kg Conc.	Qual.								
100-75-4	N-Nitrosopiperidine	360	U	470	U	380	U	390	U	370	U
122-09-8	Phenyl-tert-butylamine	1700	U	2300	U	1800	U	1900	U	1800	U
87-65-0	2,6-Dichlorophenol	360	U	470	U	380	U	390	U	370	U
924-16-3	N-Nitrosodi-n-butylamine	360	U	470	U	380	U	390	U	370	U
55-18-5	N-Nitrosodiethylamine	360	U	470	U	380	U	390	U	370	U
930-55-2	N-Nitrosopyrrolidine	360	U	470	U	380	U	390	U	370	U
92-87-5	Benzidine	1700	U	2300	U	1800	U	1900	U	1800	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1700	U	2300	U	1800	U	1900	U	1800	U
608-93-5	Pentachlorobenzene	1700	U	2300	U	1800	U	1900	U	1800	U
134-32-7	1-Naphthylamine	1700	U	2300	U	1800	U	1900	U	1800	U
91-59-8	2-Naphthylamine	1700	U	2300	U	1800	U	1900	U	1800	U
58-90-2	2,3,4,6-Tetrachlorophenol	360	U	470	U	380	U	390	U	370	U
122-39-4	Diphenylamine	360	U	470	U	380	U	390	U	370	U
62-44-2	Phenacetin	360	U	470	U	380	U	390	U	370	U
92-67-1	4-Aminobiphenyl	1700	U	2300	U	1800	U	1900	U	1800	U
82-68-8	Pentachloronitrobenzene	1700	U	2300	U	1800	U	1900	U	1800	U
23950-58-5	Pronamide	360	U	470	U	380	U	390	U	370	U
60-11-7	p-(Dimethylamino)azobenzene	360	U	470	U	380	U	390	U	370	U
57-97-6	7,12-Dimethylbenz[a]anthracene	360	U	470	U	380	U	390	U	370	U
56-49-5	Methylcholanthrene	360	U	470	U	380	U	390	U	370	U
110-86-1	Pyridine	1700	U	2300	U	1800	U	1900	U	1800	U
10595-95-6	N-Nitrosomethylethylamine	360	U	470	U	380	U	390	U	370	U
59-89-2	N-Nitrosomorpholine	360	U	470	U	380	U	390	U	370	U
95-53-4	o-Toluidine	360	U	470	U	380	U	390	U	370	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-U-1		MPT-22-L-1		MPT-22-U-2		MPT-22-L-2		MPT-22-U-3	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		03/11/92		03/11/92		03/11/92		03/11/92		03/11/92	
DATE SAMPLED:		21171		21171		21171		21171		21171	
LAB NUMBER:		21171		21171		21171		21171		21171	
CAS RN	Common name	ug/Kg Conc.	Qual.								
108-39-4	3(&4)-Methylphenol	720	U	940	U	760	U	790	U	750	U
1888-71-7	Hexachloropropene	1700	U	2300	U	1800	U	1900	U	1800	U
106-50-3	p-Phenylenediamine	1700	U	2300	U	1800	U	1900	U	1800	U
94-59-7	Saifrole	1700	U	2300	U	1800	U	1900	U	1800	U
120-58-1	Isosafrole	1700	U	2300	U	1800	U	1900	U	1800	U
130-15-4	1,4-Naphthoquinone	1700	U	2300	U	1800	U	1900	U	1800	U
99-65-0	1,3-Dinitrobenzene	360	U	470	U	380	U	390	U	370	U
99-55-8	5-Nitro-o-toluidine	360	U	470	U	380	U	390	U	370	U
99-35-4	1,3,5-Trinitrobenzene	360	U	470	U	380	U	390	U	370	U
56-57-5	4-Nitroquinoline 1-oxide	360	U	470	U	380	U	390	U	370	U
91-80-5	Methapyrene	1700	U	2300	U	1800	U	1900	U	1800	U
119-93-7	3,3'-Dimethylbenzidine	360	U	470	U	380	U	390	U	370	U
53-96-3	2-Acetylaminofluorene	360	U	470	U	380	U	390	U	370	U
70-30-4	Hexachlorophene	1700	U	2300	U	1800	U	1900	U	1800	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:		21171	21171	21171	21171
CAS RN	Common name	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.
		Qual.	Qual.	Qual.	Qual.
62-75-9	N-Nitrosodimethylamine	410	390	390	350
108-95-2	Phenol	410	390	390	350
62-53-3	Aniline	410	390	390	350
111-44-4	bis(2-Chloroethyl)Ether	410	390	390	350
95-57-8	2-Chlorophenol	410	390	390	350
541-73-1	1,3-Dichlorobenzene	410	390	390	350
106-46-7	1,4-Dichlorobenzene	410	390	390	350
100-51-6	Benzyl alcohol	410	390	390	350
95-50-1	1,2-Dichlorobenzene	410	390	390	350
95-48-7	2-Methylphenol	410	390	390	350
39638-32-9	bis(2-chloroethyl)Ether	410	390	390	350
106-44-5	4-Methylphenol	410	390	390	350
621-64-7	N-Nitroso-Di-n-Propylamine	410	390	390	350
67-72-1	Hexachloroethane	410	390	390	350
98-95-3	Nitrobenzene	410	390	390	350
78-59-1	Isophorone	410	390	390	350
88-75-5	2-Nitrophenol	410	390	390	350
105-67-9	2,4-Dimethylphenol	410	390	390	350
65-85-0	Benzoic Acid	2000	1900	1900	350
111-91-1	Bis(2-chloroethoxy)methane	410	390	390	350
120-83-2	2,4-Dichlorophenol	410	390	390	350
120-82-1	1,2,4-Trichlorobenzene	410	390	390	350
91-20-3	Naphthalene	410	390	390	350
106-47-8	4-Chloroaniline	410	390	390	350

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-L-3		MPT-22-U-4		MPT-22-L-4		MPT-22-D-1	
LOCATION:		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		03/11/92		03/11/92		03/11/92		03/11/92	
DATE SAMPLED:		21171		21171		21171		21171	
LAB NUMBER:									
CAS RN	Common name	ug/Kg Conc.	Qual.	ug/Kg Conc.	Qual.	ug/Kg Conc.	Qual.	ug/Kg Conc.	Qual.
87-68-3	Hexachlorobutadiene	410	U	390	U	390	U	350	U
59-50-7	4-Chloro-3-Methylphenol	410	U	390	U	390	U	350	U
91-57-6	2-Methylnaphthalene	410	U	390	U	390	U	350	U
77-47-4	Hexachlorocyclopentadiene	410	U	390	U	390	U	350	U
88-06-2	2,4,6-Trichlorophenol	410	U	390	U	390	U	350	U
95-95-4	2,4,5-Trichlorophenol	2000	U	1900	U	1900	U	1700	U
91-58-7	2-Chloronaphthalene	410	U	390	U	390	U	350	U
88-74-4	2-Nitroaniline	2000	U	1900	U	1900	U	1700	U
131-11-3	Dimethyl phthalate	410	U	390	U	390	U	350	U
208-96-8	Acenaphthylene	410	U	390	U	390	U	350	U
606-20-2	2,6-Dinitrotoluene	410	U	390	U	390	U	350	U
99-09-2	3-Nitroaniline	2000	U	1900	U	1900	U	1700	U
83-32-9	Acenaphthene	410	U	390	U	390	U	350	U
51-28-5	2,4-Dinitrophenol	2000	U	1900	U	1900	U	1700	U
100-02-7	4-Nitrophenol	2000	U	1900	U	1900	U	1700	U
132-64-9	Dibenzofuran	410	U	390	U	390	U	350	U
121-14-2	2,4-Dinitrotoluene	410	U	390	U	390	U	350	U
84-66-2	Diethyl phthalate	410	U	390	U	390	U	350	U
7005-72-3	4-Chlorophenyl phenyl ether	410	U	390	U	390	U	350	U
86-73-7	Fluorene	410	U	390	U	390	U	350	U
100-10-6	4-Nitroaniline	2000	U	1900	U	1900	U	1700	U
534-52-1	4,6-Dinitro-2-Methylphenol	2000	U	1900	U	1900	U	1700	U
86-30-6	N-Nitrosodiphenylamine	410	U	390	U	390	U	350	U
122-66-7	1,2-Diphenylhydrazine	410	U	390	U	390	U	350	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:					
UNITS:		ug/Kg	ug/Kg	ug/Kg	ug/Kg
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.
101-55-3	4-Bromophenyl phenyl ether	410	U	390	U
118-74-1	Hexachlorobenzene	410	U	390	U
87-86-5	Pentachlorophenol	2000	U	1900	U
85-01-8	Phenanthrene	410	U	390	U
120-12-7	Anthracene	410	U	390	U
84-74-2	Di-n-butyl phthalate	410	U	390	U
206-44-0	Fluoranthene	410	U	390	U
129-00-0	Pyrene	410	U	390	U
85-68-7	Butyl benzyl phthalate	410	U	390	U
91-94-1	3,3'-Dichlorobenzidine	820	U	780	U
56-55-3	Benzofluranthracene	410	U	390	U
218-01-9	Chrysene	410	U	390	U
117-81-7	Bis(2-ethylhexyl) phthalate	250	BJ	390	U
117-84-0	Di-n-octyl phthalate	410	U	390	U
205-99-2	Benzofluoranthene	410	U	390	U
207-08-9	Benzofluoranthene	410	U	390	U
50-32-8	Benzofluoranthene	410	U	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U	390	U
53-70-3	Dibenz[a,h]anthracene	410	U	390	U
191-24-2	Benzofluoranthene	410	U	390	U
109-06-8	2-Picoline	2000	U	1900	U
66-27-3	Methyl methanesulfonate	410	U	390	U
62-50-0	Ethyl methanesulfonate	410	U	390	U
98-86-2	Acetophenone	410	U	390	U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:\MPTDT11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:					
CAS RN	Common name	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.
100-75-4	N-Nitrosopiperidine	410 U	390 U	390 U	350 U
122-09-8	Phenyl-tert-butylamine	2000 U	1900 U	1900 U	1700 U
87-65-0	2,6-Dichlorophenol	410 U	390 U	390 U	350 U
924-16-3	N-Nitrosodi-n-butylamine	410 U	390 U	390 U	350 U
55-18-5	N-Nitrosodiethylamine	410 U	390 U	390 U	350 U
930-55-2	N-Nitrosopyrrolidine	410 U	390 U	390 U	350 U
92-87-5	Benzidine	2000 U	1900 U	1900 U	1700 U
95-94-3	1,2,4,5-Tetrachlorobenzene	2000 U	1900 U	1900 U	1700 U
608-93-5	Pentachlorobenzene	2000 U	1900 U	1900 U	1700 U
134-32-7	1-Naphthylamine	2000 U	1900 U	1900 U	1700 U
91-59-8	2-Naphthylamine	2000 U	1900 U	1900 U	1700 U
58-90-2	2,3,4,6-Tetrachlorophenol	410 U	390 U	390 U	350 U
122-39-4	Diphenylamine	410 U	390 U	390 U	350 U
62-44-2	Phenacetin	410 U	390 U	390 U	350 U
92-67-1	4-Aminobiphenyl	2000 U	1900 U	1900 U	1700 U
82-68-8	Pentachloronitrobenzene	2000 U	1900 U	1900 U	1700 U
23950-58-5	Pronamide	410 U	390 U	390 U	350 U
60-11-7	p-(Dimethylamino)azobenzene	410 U	390 U	390 U	350 U
57-97-6	7,12-Dimethylbenz[a]anthracene	410 U	390 U	390 U	350 U
56-49-5	Methylcholanthrene	410 U	390 U	390 U	350 U
110-86-1	Pyridine	2000 U	1900 U	1900 U	1700 U
10595-95-6	N-Nitrosomethylethylamine	410 U	390 U	390 U	350 U
59-89-2	N-Nitrosomorpholine	410 U	390 U	390 U	350 U
95-53-4	o-Toluidine	410 U	390 U	390 U	350 U

*Blank entries indicate that sample was not analyzed for that analyte group

SEMIVOLATILE ORGANIC COMPOUNDS: SOIL

A:IMPTDT11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:					
CAS RN	Common name	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.
108-39-4	3(&4)-Methylphenol	820	780	790	710
1888-71-7	Hexachloropropene	2000	1900	1900	1700
106-50-3	p-Phenylenediamine	2000	1900	1900	1700
94-59-7	Safrrole	2000	1900	1900	1700
120-58-1	Isosafrole	2000	1900	1900	1700
130-15-4	1,4-Naphthoquinone	2000	1900	1900	1700
99-65-0	1,3-Dinitrobenzene	410	390	390	350
99-55-8	5-Nitro-o-toluidine	410	390	390	350
99-35-4	1,3,5-Trinitrobenzene	410	390	390	350
56-57-5	4-Nitroquinoline 1-oxide	410	390	390	350
91-80-5	Methapyriene	2000	1900	1900	1700
119-93-7	3,3'-Dimethylbenzidine	410	390	390	350
53-96-3	2-Acetylaminofluorene	410	390	390	350
70-30-4	Hexachlorophene	2000	1900	1900	1700

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SOIL

A:\MPTDAT7.WK1		MPT-2-11SD		MPT-2-11SD		MPT-2-12SD		MPT-2-16S	
LOCATION:		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753	
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
319-84-6	alpha-BHC	0.5	U	4.7	U	0.5	U	4.9	U
319-85-7	beta-BHC	0.9	U	9.3	U	1	U	9.9	U
319-86-8	delta-BHC	0.5	U	4.7	U	0.5	U	4.9	U
58-89-9	gamma-BHC; Lindane	0.5	U	4.7	U	0.5	U	4.9	U
76-44-8	Heptachlor	0.5	U	4.7	U	0.5	U	4.9	U
309-00-2	Aldrin	0.5	U	4.7	U	0.5	U	4.9	U
1024-57-3	Heptachlor epoxide	0.5	U	4.7	U	0.5	U	4.9	U
959-98-8	Endosulfan I	0.9	U	9.3	U	1	U	9.9	U
60-57-1	Dieldrin	0.9	U	9.3	U	1	U	9.9	U
72-55-9	4,4'-DDE	0.9	U	9.3	U	1	U	9.9	U
72-20-8	Endrin	0.9	U	9.3	U	1	U	9.9	U
33213-65-9	Endosulfan II	0.9	U	9.3	U	1	U	9.9	U
72-54-8	4,4'-DDD	0.9	U	9.3	U	1	U	9.9	U
7421-93-4	Endrin aldehyde	0.9	U	9.3	U	1	U	9.9	U
1031-07-8	Endosulfan sulfate	0.9	U	9.3	U	1	U	9.9	U
50-29-3	4,4'-DDT	0.9	U	9.3	U	1	U	9.9	U
72-43-5	Methoxychlor	1.9	U	19	U	2	U	20	U
53494-70-5	Endrin Ketone	0.9	U	9.3	U	1	U	9.9	U
57-74-09	Chlordane	4.7	U	47	U	4.9	U	49	U
8001-35-2	Toxaphene	23	U	230	U	25	U	250	U
12674-11-2	Aroclor-1016	37	U	370	U	40	U	400	U
11104-28-2	Aroclor-1221	93	U	930	U	99	U	990	U
11141-16-5	Aroclor-1232	93	U	930	U	99	U	990	U
53469-21-9	Aroclor-1242	37	U	370	U	40	U	400	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SOIL

A:IMPTDAT7.WK1		MPT-2-11S		MPT-2-11SDL		MPT-2-12S		MPT-2-12SDL		MPT-2-16S	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
CAS RN	Common name	µg/Kg Conc.	Qual.								
12672-29-6	Aroclor-1248	19	U	190	U	20	U	200	U	19	U
11097-69-1	Aroclor-1254	9.3	U	93	U	9.9	U	99	U	9.6	U
11096-82-5	Aroclor-1260	9.3	U	93	U	9.9	U	99	U	9.6	U
510-15-6	Chlorobenzilate	23	U	230	U	25	U	250	U	24	U
2303-16-4	Diallate	47	U	470	U	49	U	490	U	48	U
465-73-6	Isodrin	0.9	U	9.3	U	1	U	9.9	U	1	U
143-50-0	Kepona	NR									

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SOIL

A:\MPTDAT7.WK1		MPT-13-5		MPT-13-6		MPT-13-6DL		MPT-22-1S		MPT-22-1SDL	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
CAS RN	Common name	µg/Kg Conc.	Qual.								
319-84-6	alpha-BHC	4.9	U	0.5	U	4.8	U	0.6	U	5.8	U
319-85-7	beta-BHC	9.8	U	1	U	9.6	U	1.2	U	12	U
319-86-8	delta-BHC	4.9	U	0.5	U	4.8	U	0.6	U	5.8	U
58-89-9	gamma-BHC; Lindane	4.9	U	0.5	U	4.8	U	0.6	U	5.8	U
76-44-8	Heptachlor	4.9	U	0.5	U	4.8	U	0.6	U	5.8	U
309-00-2	Aldrin	4.9	U	0.5	U	4.8	U	0.6	U	5.8	U
1024-57-3	Heptachlor epoxide	4.9	U	0.5	U	4.8	U	0.6	U	5.8	U
959-98-8	Endosulfan I	9.8	U	1	U	9.6	U	1.2	U	12	U
60-57-1	Dieldrin	9.8	U	1	U	9.6	U	1.2	U	12	U
72-55-9	4,4'-DDE	9.8	U	1	U	9.6	U	1.2	U	12	U
72-20-8	Endrin	9.8	U	1	U	9.6	U	1.2	U	12	U
33213-65-9	Endosulfan II	9.8	U	1	U	9.6	U	1.2	U	12	U
72-54-8	4,4'-DDD	9.8	U	1	U	9.6	U	1.2	U	12	U
7421-93-4	Endrin aldehyde	9.8	U	1	U	9.6	U	1.2	U	12	U
1031-07-8	Endosulfan sulfate	9.8	U	1	U	9.6	U	1.2	U	12	U
50-29-3	4,4'-DDT	9.8	U	1	U	9.6	U	1.2	U	12	U
72-43-5	Methoxychlor	20	U	1.9	U	19	U	2.3	U	23	U
53494-70-5	Endrin Ketone	9.8	U	1	U	9.6	U	1.2	U	12	U
57-74-09	Chlordane	49	U	4.8	U	48	U	5.8	U	58	U
8001-35-2	Toxaphene	240	U	24	U	240	U	29	U	290	U
12674-11-2	Aroclor-1016	390	U	39	U	390	U	46	U	460	U
11104-28-2	Aroclor-1221	980	U	96	U	960	U	120	U	1200	U
11141-16-5	Aroclor-1232	980	U	96	U	960	U	120	U	1200	U
53469-21-9	Aroclor-1242	390	U	39	U	390	U	46	U	460	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SOIL

A:\MPTIDAT7.WK1		MPT-13-5	MPT-13-6	MPT-13-6DL	MPT-22-1S	MPT-22-1SDL
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
DATE SAMPLED:		20753	20753	20753	20753	20753
LAB NUMBER:						
CAS RN	UNITS:	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
	Common name	Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
12672-29-6	Aroclor-1248	200	19	190	23	230
11097-69-1	Aroclor-1254	98	9.6	96	12	120
11096-82-5	Aroclor-1260	98	9.6	96	12	120
510-15-6	Chlorobenzilate	240	24	240	29	290
2303-16-4	Diallate	490	48	480	58	580
465-73-6	Isodrin	9.8	1	9.6	1.2	12
143-50-0	Kepon	NR	NR	NR	NR	NR

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SOIL

A:\MPTDT11.WK1		MPT-22-U-1	MPT-22-L-1	MPT-22-U-2	MPT-22-L-2	MPT-22-U-3	
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92	03/11/92	
DATE SAMPLED:		21171	21171	21171	21171	21171	
LAB NUMBER:		21171	21171	21171	21171	21171	
CAS RN	Common name	ug/Kg Conc.	Qual.	ug/Kg Conc.	Qual.	ug/Kg Conc.	Qual.
319-84-6	alpha-BHC	9	U	11	U	10	U
319-85-7	beta-BHC	9	U	11	U	10	U
319-86-8	delta-BHC	9	U	11	U	10	U
58-89-9	gamma-BHC; Lindane	9	U	11	U	10	U
76-44-8	Heptachlor	9	U	11	U	10	U
309-00-2	Aldrin	9	U	11	U	10	U
1024-57-3	Heptachlor epoxide	9	U	11	U	10	U
959-98-8	Endosulfan I	17	U	23	U	19	U
60-57-1	Dieldrin	17	U	23	U	19	U
72-55-9	4,4'-DDE	17	U	23	U	19	U
72-20-8	Endrin	17	U	23	U	19	U
33213-65-9	Endosulfan II	17	U	23	U	19	U
72-54-8	4,4'-DDD	17	U	23	U	19	U
7421-93-4	Endrin aldehyde	17	U	23	U	19	U
1031-07-8	Endosulfan sulfate	17	U	23	U	19	U
50-29-3	4,4'-DDT	17	U	23	U	19	U
72-43-5	Methoxychlor	87	U	23	U	19	U
53494-70-5	Endrin Ketone	17	U	110	U	95	U
57-74-09	Chlordane	87	U	23	U	19	U
8001-35-2	Toxaphene	170	U	230	U	190	U
12674-11-2	Aroclor-1016	87	U	110	U	95	U
11104-28-2	Aroclor-1221	87	U	110	U	95	U
11141-16-5	Aroclor-1232	87	U	110	U	95	U
53469-21-9	Aroclor-1242	87	U	110	U	95	U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SOIL

A:\MPTDT11.WK1		MPT-22-U-1	MPT-22-L-1	MPT-22-U-2	MPT-22-L-2	MPT-22-U-3	
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92	03/11/92	
DATE SAMPLED:		21171	21171	21171	21171	21171	
LAB NUMBER:							
CAS RN	Common name	ug/Kg Conc.	Qual.	ug/Kg Conc.	Qual.	ug/Kg Conc.	Qual.
12672-29-6	Aroclor-1248	87	U	110	U	92	U
11097-69-1	Aroclor-1254	170	U	230	U	180	U
11096-82-5	Aroclor-1260	170	U	230	U	180	U
510-15-6	Chlorobenzilate	22	U	29	U	23	U
2303-16-4	Diallate	43	U	57	U	46	U
465-73-6	Isodrin	0.9	U	1.1	U	0.9	U
143-50-0	Kepona		NR		NR		NR

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SOIL

A:\MPTDT11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:					
CAS RN	Common name	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.
UNITS:		Qual.	Qual.	Qual.	Qual.
319-84-6	alpha-BHC	10 U	9 U	10 U	9 U
319-85-7	beta-BHC	10 U	9 U	10 U	9 U
319-86-8	delta-BHC	10 U	9 U	10 U	9 U
58-89-9	gamma-BHC; Lindane	10 U	9 U	10 U	9 U
76-44-8	Heptachlor	10 U	9 U	10 U	9 U
309-00-2	Aldrin	10 U	9 U	10 U	9 U
1024-57-3	Heptachlor epoxide	10 U	9 U	10 U	9 U
959-98-8	Endosulfan I	20 U	19 U	19 U	17 U
60-57-1	Dieldrin	20 U	19 U	19 U	17 U
72-55-9	4,4'-DDE	20 U	19 U	19 U	17 U
72-20-8	Endrin	20 U	19 U	19 U	17 U
33213-65-9	Endosulfan II	20 U	19 U	19 U	17 U
72-54-8	4,4'-DDD	20 U	19 U	19 U	17 U
7421-93-4	Endrin aldehyde	20 U	19 U	19 U	17 U
1031-07-8	Endosulfan sulfate	20 U	19 U	19 U	17 U
50-29-3	4,4'-DDT	20 U	19 U	19 U	17 U
72-43-5	Methoxychlor	100 U	94 U	95 U	87 U
53494-70-5	Endrin Ketone	100 U	19 U	19 U	17 U
57-74-09	Chlordane	20 U	94 U	95 U	87 U
8001-35-2	Toxaphene	200 U	190 U	190 U	170 U
12674-11-2	Aroclor-1016	100 U	94 U	95 U	87 U
11104-28-2	Aroclor-1221	100 U	94 U	95 U	87 U
11141-16-5	Aroclor-1232	100 U	94 U	95 U	87 U
53469-21-9	Aroclor-1242	100 U	94 U	95 U	87 U

*Blank entries indicate that sample was not analyzed for that analyte group

PCB & CHLORINATED PESTICIDES: SOIL

A:\MPTDT11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:					
CAS RN	Common name	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.	ug/Kg Conc.
12672-29-6	Aroclor-1248	100 U	94 U	95 U	87 U
11097-69-1	Aroclor-1254	200 U	190 U	190 U	170 U
11096-82-5	Aroclor-1260	200 U	190 U	190 U	170 U
510-15-6	Chlorobenzilate	25 U	24 U	24 U	22 U
2303-16-4	Diallate	50 U	47 U	48 U	43 U
465-73-6	Isodrin	1 U	0.9 U	1 U	0.9 U
143-50-0	Kepone	NR	NR	NR	NR

*Blank entries indicate that sample was not analyzed for that analyte group

PCBs (SWMU 2): SOIL

A:\MPTDAT11.WK1		MPT-2-A1		MPT-2-A1-(1)		MPT-2-B1		MPT-2-B1-(1)		MPT-2-B4	
LOCATION/SAMPLE:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		02/24/92		02/27/92		02/26/92		02/27/92		02/24/92	
DATE SAMPLED:		21018		21060		21042		21060		21018	
LAB NUMBER:											
UNITS:		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
CAS RN	Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
12674-11-2	Aroclor-1016	17000	U	35	U	2900	U	36	U	190	U
11104-28-2	Aroclor-1221	43000	U	87	U	7200	U	91	U	460	U
11141-16-5	Aroclor-1232	43000	U	87	U	7200	U	91	U	460	U
53469-21-9	Aroclor-1242	17000	U	35	U	2900	U	36	U	190	U
12672-29-6	Aroclor-1248	8700	U	17	U	1400	U	18	U	93	U
11097-69-1	Aroclor-1254	4300	U	8.7	U	720	U	9.1	U	46	U
11096-82-5	Aroclor-1260	68000		1600		7900		830		230	

PCBs (SWMU 2): SOIL

A:\MPTDAT11.WK1		MPT-2-B4-(1)		MPT-2-C1		MPT-2-C1-(1)		MPT-2-C3		MPT-2-C6	
LOCATION/SAMPLE:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		02/26/92		02/26/92		02/27/92		02/26/92		02/24/92	
DATE SAMPLED:		21042		21042		21060		21042		21018	
LAB NUMBER:		21042		21042		21060		21042		21018	
CAS RN	UNITS:	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.
Common name		Conc.		Conc.		Conc.		Conc.		Conc.	
12674-11-2	Aroclor-1016	38	U	7500	U	37	U	15000	U	40	U
11104-28-2	Aroclor-1221	95	U	19000	U	92	U	38000	U	100	U
11141-16-5	Aroclor-1232	95	U	19000	U	92	U	38000	U	100	U
53469-21-9	Aroclor-1242	38	U	7500	U	37	U	15000	U	40	U
12672-29-6	Aroclor-1248	19	U	3800	U	18	U	7500	U	20	U
11097-69-1	Aroclor-1254	10	U	1900	U	9.2	U	3800	U	10	U
11096-82-5	Aroclor-1260	73	U	26000	U	200	U	42000	U	260	U

PCBs (SWMU 2): SOIL

A:\MPTDAT\11.WK1		MPT-2-C6-(1)		MPT-2-D2		MPT-2-D2-(1)		MPT-2-D3		MPT-2-D4	
LOCATION/SAMPLE:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		02/27/92		02/25/92		02/26/92		02/24/92		02/25/92	
DATE SAMPLED:		21060		21029		21042		21018		21029	
LAB NUMBER:											
CAS RN	Common name	µg/Kg Conc.	Qual.								
12674-11-2	Aroclor-1016	36	U	1500	U	36	U	15000	U	32000	U
11104-28-2	Aroclor-1221	91	U	3800	U	89	U	37000	U	79000	U
11141-16-5	Aroclor-1232	91	U	3800	U	89	U	37000	U	79000	U
53469-21-9	Aroclor-1242	36	U	1500	U	36	U	15000	U	32000	U
12672-29-6	Aroclor-1248	18	U	760	U	18	U	7400	U	16000	U
11097-69-1	Aroclor-1254	9.1	U	380	U	9	U	3700	U	7900	U
11096-82-5	Aroclor-1260	37	U	4200	U	53	U	36000	U	120000	U

PCBs (SWMU 2): SOIL

A:\MPTDAT11.WK1		MPT-2-D4-(1)		MPT-2-E2		MPT-2-E5		MPT-2-E5-(1)		MPT-2-E6	
LOCATION/SAMPLE:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		02/26/92		02/25/92		02/25/92		02/26/92		02/25/92	
DATE SAMPLED:		21042		21029		21029		21042		21029	
LAB NUMBER:											
CAS RN	UNITS:	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.
Common name		Conc.		Conc.		Conc.		Conc.		Conc.	
12674-11-2	Aroclor-1016	190	U	3200	U	1500	U	36	U	200	U
11104-28-2	Aroclor-1221	480	U	8000	U	3800	U	90	U	510	U
11141-16-5	Aroclor-1232	480	U	8000	U	3800	U	90	U	510	U
53469-21-9	Aroclor-1242	190	U	3200	U	1500	U	36	U	200	U
12672-29-6	Aroclor-1248	96	U	1600	U	760	U	18	U	100	U
11097-69-1	Aroclor-1254	48	U	800	U	380	U	9	U	51	U
11096-82-5	Aroclor-1260	750	U	16000	U	5000	U	35	U	400	U

PCBs (SWMU 2): SOIL

A:\MPTDAT11.WK1		MPT-2-E6-(1)		MPT-2-F3-(1)		MPT-2-F3-(DUP1)		MPT-2-G1		MPT-2-G1D	
LOCATION/SAMPLE:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		02/26/92		02/27/92		02/27/92		02/25/92		02/25/92	
DATE SAMPLED:		21042		21060		21060		21029		21029	
LAB NUMBER:											
CAS RN	Common name	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.	µg/Kg Conc.	Qual.
12674-11-2	Aroclor-1016	72	U	38	U	38	U	3200	U	2000	U
11104-28-2	Aroclor-1221	180	U	94	U	94	U	7900	U	4900	U
11141-16-5	Aroclor-1232	180	U	94	U	94	U	7900	U	4900	U
53469-21-9	Aroclor-1242	72	U	38	U	38	U	3200	U	2000	U
12672-29-6	Aroclor-1248	36	U	19	U	19	U	1600	U	990	U
11097-69-1	Aroclor-1254	18	U	9.4	U	9.4	U	790	U	490	U
11096-82-5	Aroclor-1260	440	JX	7.1	JX	5.6	JX	11000	JX	6400	JX

PCBs (SWMU 2): SOIL

A:\MPTDAT11.WK1		MPT-2-G2		MPT-2-G4		MPT-2-G4-(1)		MPT-2-G6		MPT-2-G6-(1)	
LOCATION/SAMPLE:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		02/25/92		02/25/92		02/26/92		02/25/92		02/26/92	
DATE SAMPLED:		21029		21029		21042		21029		21042	
LAB NUMBER:											
CAS RN	Common name	µg/Kg Conc.	Qual.								
12674-11-2	Aroclor-1016	370	U	200	U	740	U	98	U	37	U
11104-28-2	Aroclor-1221	930	U	510	U	1800	U	240	U	92	U
11141-16-5	Aroclor-1232	930	U	510	U	1800	U	240	U	92	U
53469-21-9	Aroclor-1242	370	U	200	U	740	U	98	U	37	U
12672-29-6	Aroclor-1248	190	U	100	U	370	U	49	U	18	U
11097-69-1	Aroclor-1254	93	U	51	U	180	U	24	U	9	U
11096-82-5	Aroclor-1260	1200	U	330	U	2300	U	260	U	15	U

PCBs (SWMU 2): SOIL

A:\MPTDAT11.WK1		MPT-2-H4		MPT-2-H4-(1)		MPT-2-H6		MPT-2-H6-(1)		MPT-2-I1	
LOCATION/SAMPLE:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		02/26/92		02/27/92		02/25/92		02/27/92		02/24/92	
DATE SAMPLED:		21042		21060		21029		21060		21018	
LAB NUMBER:											
CAS RN	UNITS:	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.	µg/Kg	Qual.
Common name		Conc.		Conc.		Conc.		Conc.		Conc.	
12674-11-2	Aroclor-1016	390	U	36	U	190	U	37	U	380	U
11104-28-2	Aroclor-1221	980	U	90	U	480	U	93	U	960	U
11141-16-5	Aroclor-1232	980	U	90	U	480	U	93	U	960	U
53469-21-9	Aroclor-1242	390	U	36	U	190	U	37	U	380	U
12672-29-6	Aroclor-1248	200	U	18	U	95	U	19	U	190	U
11097-69-1	Aroclor-1254	98	U	9	U	48	U	9.3	U	96	U
11096-82-5	Aroclor-1260	1500		19		360		20		110	

PCBs (SWMU 2): SOIL

A:\MPTDAT11.WK1		MPT-2-11-(1)		MPT-2-12		MPT-2-12-(1)		MPT-2-13		MPT-2-13D	
LOCATION/SAMPLE:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		02/27/92		02/26/92		02/27/92		02/26/92		02/26/92	
DATE SAMPLED:		21060		21042		21060		21042		21042	
LAB NUMBER:											
CAS RN	UNITS:	µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
Common name	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.
12674-11-2	Aroclor-1016	38	U	180	U	37	U	370	U	740	U
11104-28-2	Aroclor-1221	94	U	450	U	92	U	920	U	1800	U
11141-16-5	Aroclor-1232	94	U	450	U	92	U	920	U	1800	U
53469-21-9	Aroclor-1242	38	U	180	U	37	U	370	U	740	U
12672-29-6	Aroclor-1248	19	U	91	U	18	U	180	U	370	U
11097-69-1	Aroclor-1254	9.4	U	45	U	9.2	U	92	U	180	U
11096-82-5	Aroclor-1260	6.1	JX	350		9.2		1100		3100	

METALS & CYANIDE: SOIL

A:\MPTDAT7.WK1		MPT-2-16SDL	MPT-2-17S	MPT-2-17SDL	MPT-13-4	MPT-13-4DUP
LOCATION:		SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		01/24/92	01/24/92	01/24/92	01/24/92	01/24/92
DATE SAMPLED:		20753	20753	20753	20753	20753
LAB NUMBER:		20753	20753	20753	20753	20753
CAS RN	UNITS:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
	Common name	Conc.	Conc.	Conc.	Conc.	Conc.
		Qual.	Qual.	Qual.	Qual.	Qual.
7440-36-0	Antimony		8.6	U	8.8	U
7440-38-2	Arsenic		0.86	B	0.52	B
7440-39-3	Barium		5.3	B	7.5	B
7440-41-7	Beryllium		0.023	U	0.023	U
7440-43-9	Cadmium		0.35	U	0.36	U
7440-47-3	Chromium		4.3		2.8	
7440-48-4	Cobalt		1.1	U	1.1	U
7440-50-8	Copper		0.69	B	2	B
7440-92-1	Lead		1.8		2.4	
7440-97-6	Mercury		0.084	U	0.078	U
7440-02-0	Nickel		1.5	U	2.5	B
7440-49-2	Selenium		0.28	U	0.28	U
7440-22-4	Silver		0.5	U	0.51	U
7440-28-0	Thallium		0.3	U	0.31	U
7440-31-5	Tin		44.8	U	46	U
7440-62-2	Vanadium		3.4	B	2.7	B
7440-66-6	Zinc		5.7		19.4	
	Cyanide			NR		NR

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SOIL

A:\MPTDAT7.WK1		MPT-13-5		MPT-13-6		MPT-13-6DL		MPT-22-1S		MPT-22-1SDL	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		01/24/92		01/24/92		01/24/92		01/24/92		01/24/92	
DATE SAMPLED:		20753		20753		20753		20753		20753	
LAB NUMBER:		20753		20753		20753		20753		20753	
CAS RN	Common name	mg/Kg Conc.	Qual.								
7440-36-0	Antimony	9.2	U	9.8	B			11	U		
7440-38-2	Arsenic	0.17	B	0.16	U			3.7			
7440-39-3	Barium	6.6	B	2.5	B			14.1	B		
7440-41-7	Beryllium	0.024	U	0.024	U			0.17	B		
7440-43-9	Cadmium	0.37	U	0.36	U			0.44	U		
7440-47-3	Chromium	2.1	B	1.8	B			16.9			
7440-48-4	Cobalt	1.2	U	1.2	U			2	B		
7440-50-8	Copper	0.41	B	1.7	B			1.8	B		
7440-92-1	Lead	1.3		1.1				4.7			
7440-97-6	Mercury	0.076	U	0.073	U			0.094	U		
7440-02-0	Nickel	1.6	U	1.6	U			2.7	B		
7440-49-2	Selenium	0.3	U	0.29	U			0.35	U		
7440-22-4	Silver	0.53	U	0.52	U			0.64	U		
7440-28-0	Thallium	0.32	U	0.32	U			0.39	U		
7440-31-5	Tin	47.9	U	47	U			57.5	U		
7440-62-2	Vanadium	1.9	B	1.7	B			17.4			
7440-66-6	Zinc	7.5		11.6				24.6			
	Cyanide		NR		NR				NR		

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SOIL

A:\MPTDT11.WK1		MPT-22-U-1		MPT-22-L-1		MPT-22-U-2		MPT-22-L-2		MPT-22-U-3	
LOCATION:		SOIL		SOIL		SOIL		SOIL		SOIL	
SAMPLE MATRIX:		03/11/92		03/11/92		03/11/92		03/11/92		03/11/92	
DATE SAMPLED:		21171		21171		21171		21171		21171	
LAB NUMBER:		21171		21171		21171		21171		21171	
CAS RN	Common name	mg/Kg Conc.	Qual.								
7440-36-0	Antimony	2.4	U	3.1	U	2.5	U	2.7	U	2.5	B
7440-38-2	Arsenic	0.76	B	3.4	B	1.1	B	1	B	1.2	B
7440-39-3	Barium	6.2	B	8.7	B	7	B	5.5	B	6.4	B
7440-41-7	Beryllium	0.04	U	0.5	B	0.08	B	0.08	B	0.09	B
7440-43-9	Cadmium	0.63	U	0.84	U	0.68	U	0.72	U	0.67	U
7440-70-2	Calcium	131000		23700		169000		149000		141000	
7440-47-3	Chromium	2.5		14.9		4.3		3.3		2.3	B
7440-48-4	Cobalt	0.77	U	2.1	B	0.83	U	0.87	U	0.81	U
7440-50-8	Copper	1.6	B	10.9	B	3.8	B	5.6	B	17.6	
7440-89-6	Iron	944		6750		1370		1010		1170	
7440-92-1	Lead	1.1		5.9		1.2		1.3		1	
7440-95-4	Magnesium	256	B	1400	B	951	B	416	B	297	B
7440-96-5	Manganese	19.2		91.7		93.4		28.4		21.2	
7440-97-6	Mercury	0.07	U	0.11	U	0.08	U	0.08	U	0.07	U
7440-31-5	Tin	45	U	59.9	U	48.4	U	50.8	U	47.5	U
7440-02-0	Nickel	1.6	B	21.6	B	1.3	B	2.3	B	1.5	B
7440-49-2	Selenium	0.28	U	0.37	U	0.3	U	0.31	U	0.29	U
7440-22-4	Silver	0.37	U	0.5	U	0.56	B	0.42	U	0.39	U
7440-23-5	Sodium	1530		469	B	1590		1730		1820	
7440-28-0	Thallium	0.24	U	0.31	U	0.25	U	0.27	U	0.25	U
7440-62-2	Vanadium	1.7	B	10.2	B	5	B	2.2	B	1.9	B
7440-66-6	Zinc	5.9		25.9		13.7		8.9		38.2	
	Cyanide	0.19	U	0.25	U	0.21	U	0.22	U	0.21	U

*Blank entries indicate that sample was not analyzed for that analyte group

METALS & CYANIDE: SOIL

A:\MPTDT11.WK1		MPT-22-L-3	MPT-22-U-4	MPT-22-L-4	MPT-22-D-1
LOCATION:		SOIL	SOIL	SOIL	SOIL
SAMPLE MATRIX:		03/11/92	03/11/92	03/11/92	03/11/92
DATE SAMPLED:		21171	21171	21171	21171
LAB NUMBER:		21171	21171	21171	21171
CAS RN	Common name	mg/Kg Conc.	mg/Kg Conc.	mg/Kg Conc.	mg/Kg Conc.
		Qual.	Qual.	Qual.	Qual.
7440-36-0	Antimony	2.8	2.7	3.9	2.3
7440-38-2	Arsenic	2.1	0.77	1	0.73
7440-39-3	Barium	6.7	3.7	5.1	4.1
7440-41-7	Beryllium	0.22	0.05	0.06	0.05
7440-43-9	Cadmium	0.76	0.72	0.72	0.63
7440-70-2	Calcium	62800	94800	120000	108000
7440-47-3	Chromium	13.3	4	3.8	2
7440-48-4	Cobalt	1	0.87	0.87	0.77
7440-50-8	Copper	11.6	4.3	5.1	2.5
7440-89-6	Iron	3910	767	997	556
7440-92-1	Lead	2.5	1.5	1.7	1
7440-95-4	Magnesium	1120	280	440	154
7440-96-5	Manganese	50.3	18.6	18.3	11.7
7440-97-6	Mercury	0.09	0.07	0.09	0.08
7440-31-5	Tin	53.9	50.9	50.8	44.9
7440-02-0	Nickel	7.6	1.6	3.4	1.3
7440-49-2	Selenium	0.33	0.31	0.31	0.28
7440-22-4	Silver	0.45	0.42	0.42	0.37
7440-23-5	Sodium	1070	1200	1710	1320
7440-28-0	Thallium	0.28	0.27	0.27	0.24
7440-62-2	Vanadium	6.9	1.4	2.2	1.1
7440-66-6	Zinc	23.3	12.8	10	3.6
	Cyanide	0.23	0.22	0.22	0.2

*Blank entries indicate that sample was not analyzed for that analyte group

GENERAL WATER QUALITY: GROUNDWATER

METHOD	ANALYTE	UNIT	MPT-2-MW1-1 WATER 02/11/92 20884	MPT-2-MW2-1 WATER 02/11/92 20884	MPT-2-MW3-1 WATER 02/09/92 20866	MPT-2-MW4-1 WATER 02/10/92 20877	MPT-2-MW5-1 WATER 02/10/92 20877
A:IMPTDT10.WK3							
LOCATION:							
SAMPLE MATRIX:							
DATE SAMPLED:							
LAB NUMBER:							
EPA310.1	ALKALINITY	mg/l	398	280	1110	842	434
EPA110.2	COLOR	ALPHA	200	30	125	50	30
EPA325.1	CHLORIDE	mg/l	5240	238	14300	478	141
EPA130.2	HARDNESS AS CaCO3	mg/l	1860	338	2740	961	843
EPA353.2	NITRATE/NITRITE	mg/l	<0.05	<0.05	<0.05	0.26	<0.05
EPA350.2	AMMONIA	mg/l	1.13	1.68	19.4	25.2	3.16
EPA413.1	OIL & GREASE	mg/l	<0.1	0.8	<0.1	14.3	0.4
EPA150.1	pH	UNIT	7.4	7.3	7.2	7.1	7.4
EPA375.4	SULFATE	mg/l	1070	9.1	5.3	547	482
EPA376.1	SULFIDE	mg/l	<0.1	0.6	5.1	2.4	0.3
EPA160.1	TDS	mg/l	7010	823	14000	2470	1380
EPA351.3	TKN	mg/l	1.21	0.49	21.4	27.6	3.54
EPA365.1	TOTAL PHOSPHOROUS	mg/l	2.4	2.7	3.95	1.03	0.75
EPA415.2	TOC	mg/l	26	10	20	18	12

*Blank entries indicate that sample was not analyzed for that analyte group

GENERAL WATER QUALITY: GROUNDWATER

A:\MPTDT10.WK3		MPT-2-MW6-1		MPT-2-MW7S-1		MPT-2-MW7D-1		MPT-2-MW8-1		MPT-2-MW9S-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/10/92		02/09/92	
DATE SAMPLED:		20884		20884		20884		20877		20866	
LAB NUMBER:		20884		20884		20884		20877		20866	
METHOD	ANALYTE	UNIT									
EPA310.1	ALKALINITY	mg/l	371	804	863	830	6.9				
EPA110.2	COLOR	ALPHA	30	70	100	70	50				
EPA325.1	CHLORIDE	mg/l	672	10900	10600	7750	4010				
EPA130.2	HARDNESS AS CaCO3	mg/l	489	2530	3860	926	1400				
EPA353.2	NITRATE/NITRITE	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05				
EPA350.2	AMMONIA	mg/l	8.69	5.74	10	25.6	16.7				
EPA413.1	OIL & GREASE	mg/l	0.1	0.3	2	0.9	2.2				
EPA150.1	pH	UNIT	7.3	7.1	7	8.4	7.2				
EPA375.4	SULFATE	mg/l	<1.0	925	1380	488	362				
EPA376.1	SULFIDE	mg/l	0.2	0.3	1.3	5	4				
EPA160.1	TDS	mg/l	1640	11700	18900	7560	8340				
EPA351.3	TKN	mg/l	9.8	8.3	10.4	29.7	18.1				
EPA365.1	TOTAL PHOSPHOROUS	mg/l	0.72	3.2	3.01	1.48	1.44				
EPA415.2	TOC	mg/l	10	36	34	22	17				

*Blank entries indicate that sample was not analyzed for that analyte group

GENERAL WATER QUALITY: GROUNDWATER

A:\MPTDT10.WK3		MPT-2-MW9D-1		MPT-2-MW10-1		MPT-2-MW11-1		MPT-2-MW12S-1		MPT-2-MW12D-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/09/92		02/10/92		02/05/92		02/05/92		02/12/92	
DATE SAMPLED:		20866		20877		20837		20837		20902	
LAB NUMBER:											
METHOD	ANALYTE	UNIT									
EPA310.1	ALKALINITY	mg/l	663	915	1240	1310	1240	1310	1240	1310	1240
EPA110.2	COLOR	ALPHA	100	70	375	300	375	300	375	300	140
EPA325.1	CHLORIDE	mg/l	34400	14400	11200	11900	11200	11900	11200	11900	3080
EPA130.2	HARDNESS AS CaCO3	mg/l	2570	1930	2330	2530	2330	2530	2330	2530	3440
EPA353.2	NITRATE/NITRITE	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
EPA350.2	AMMONIA	mg/l	4.57	19.1	7.96	6.34	7.96	6.34	7.96	6.34	12.5
EPA413.1	OIL & GREASE	mg/l	2.6	4.1	8.6	5.7	8.6	5.7	8.6	5.7	9.8
EPA150.1	pH	UNIT	6.7	7.5	7.4	7.1	7.4	7.1	7.4	7.1	6.8
EPA375.4	SULFATE	mg/l	20.8	3	360	463	360	463	360	463	1760
EPA376.1	SULFIDE	mg/l	5.8	4.2	4.5	4.4	4.5	4.4	4.5	4.4	2.5
EPA160.1	TDS	mg/l	32000	13000	11600	13000	11600	13000	11600	13000	33400
EPA351.3	TKN	mg/l	6.12	23.7	10.8	8.65	10.8	8.65	10.8	8.65	14.3
EPA365.1	TOTAL PHOSPOROUS	mg/l	0.63	1.54	3.8	4.33	3.8	4.33	3.8	4.33	4.02
EPA415.2	TOC	mg/l	19	23	41	43	41	43	41	43	28

*Blank entries indicate that sample was not analyzed for that analyte group

GENERAL WATER QUALITY: GROUNDWATER

A:\MPTDT10.WK3		MPT-2-MW15S-1 MPT-2-MW15D-1 MPT-2-MW16S-1 MPT-2-MW16DD-1 MPT-2-MW17S-1		
LOCATION:		WATER		
SAMPLE MATRIX:		WATER		
DATE SAMPLED:		02/10/92		
LAB NUMBER:		20877		
		02/10/92		
		20877		
		02/14/92		
		20931		
		02/12/92		
		20902		
METHOD	ANALYTE	UNIT		
EPA310.1	ALKALINITY	mg/l	820	923
EPA110.2	COLOR	ALPHA	150	150
EPA325.1	CHLORIDE	mg/l	1010	25400
EPA130.2	HARDNESS AS CaCO3	mg/l	1300	4230
EPA353.2	NITRATE/NITRITE	mg/l	0.07	<0.05
EPA350.2	AMMONIA	mg/l	5.89	6.78
EPA413.1	OIL & GREASE	mg/l	0.4	3.2
EPA150.1	pH	UNIT	6.9	6.8
EPA375.4	SULFATE	mg/l	439	1580
EPA376.1	SULFIDE	mg/l	0.2	5.3
EPA160.1	TDS	mg/l	3350	24100
EPA351.3	TKN	mg/l	8.1	9.72
EPA365.1	TOTAL PHOSPOROUS	mg/l	3.61	0.75
EPA415.2	TOC	mg/l	35	34
			507	390
			75	25
			594	30500
			525	2940
			<0.05	<0.05
			7.96	1.5
			7.2	1.1
			10.2	6.8
			0.9	2570
			1640	<0.1
			9.05	3.4
			0.86	0.13
			12	15
				433
				30
				72.5
				748
				<0.05
				0.7
				0.2
				7.1
				165
				<0.1
				769
				1.4
				1.91
				13

*Blank entries indicate that sample was not analyzed for that analyte group

GENERAL WATER QUALITY: GROUNDWATER

A: MPTDT10.WK3		MPT-13-MW1-1		MPT-13-MW2-1		MPT-13-MW3-1		MPT-13-MW4-1		MPT-13-MW5-1	
LOCATION:		WATER		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/11/92		02/11/92		02/05/92		02/05/92	
DATE SAMPLED:		20884		20884		20884		20850		20850	
LAB NUMBER:		20884		20884		20884		20850		20850	
METHOD	ANALYTE	UNIT									
EPA310.1	ALKALINITY	mg/l	490	310	650	402					
EPA110.2	COLOR	ALPHA	50	25	625	100					
EPA325.1	CHLORIDE	mg/l	1280	256	1010	280					
EPA130.2	HARDNESS AS CaCO3	mg/l	515	446	869	427					
EPA353.2	NITRATE/NITRITE	mg/l	<0.05	<0.05	<0.05	<0.05					
EPA350.2	AMMONIA	mg/l	4.71	1.78	5.3	1.96					
EPA413.1	OIL & GREASE	mg/l	0.4	2.1	2.4	2.9					
EPA150.1	pH	UNIT	7.1	7.3	6.7	6.9					
EPA375.4	SULFATE	mg/l	28.9	113	149	37.8					
EPA376.1	SULFIDE	mg/l	0.2	0.2	1.3	1.2					
EPA160.1	TDS	mg/l	1660	966	2690	1040					
EPA351.3	TKN	mg/l	5.2	2.6	6.34	2.57					
EPA365.1	TOTAL PHOSPHOROUS	mg/l	0.55	0.82	2.86	0.9					
EPA415.2	TOC	mg/l	13	8.8	23	9.3					

*Blank entries indicate that sample was not analyzed for that analyte group

GENERAL WATER QUALITY: GROUNDWATER

A:\MPTDT10.WK3		MPT-13-MW6-1		MPT-22-MW1-1		MPT-1-MW1-1		MPT-S-1-1	
LOCATION:		WATER		WATER		WATER		WATER	
SAMPLE MATRIX:		02/11/92		02/05/92		02/12/92		02/12/92	
DATE SAMPLED:		20884		20837		20902		20902	
LAB NUMBER:									
METHOD	ANALYTE	UNIT							
EPA310.1	ALKALINITY	mg/l	449	382	161	223			
EPA110.2	COLOR	ALPHA	70	15	10	20			
EPA325.1	CHLORIDE	mg/l	276	430	7.1	12			
EPA130.2	HARDNESS AS CaCO3	mg/l	449	612	181	338			
EPA353.2	NITRATE/NITRITE	mg/l	<0.05	<0.05	0.55	0.12			
EPA350.2	AMMONIA	mg/l	2.66	0.95	<0.1	<0.1			
EPA413.1	OIL & GREASE	mg/l	1.5	1.7	0.7	0.9			
EPA150.1	pH	UNIT	7.2	7.1	7.5	7.6			
EPA375.4	SULFATE	mg/l	157	124	128	66.3			
EPA376.1	SULFIDE	mg/l	<0.1	2.5	<0.1	<0.1			
EPA160.1	TDS	mg/l	1260	1420	213	405			
EPA351.3	TKN	mg/l	3	1.39	1.5	1.2			
EPA365.1	TOTAL PHOSPHOROUS	mg/l	0.95	0.43	0.31	0.21			
EPA415.2	TOC	mg/l		6.9	2.8	4			

*Blank entries indicate that sample was not analyzed for that analyte group

GENERAL WATER QUALITY: SURFACE WATER

METHOD	ANALYTE	UNIT	MPT-B-SW-1	MPT-B-SW-2	MPT-B-SW-3	MPT-B-SW-4	MPT-2-SW-4	MPT-2-SW-5
A:\MPTDAT9.WK3								
LOCATION:								
SAMPLE MATRIX:								
DATE SAMPLED:								
LAB NUMBER:								
			WATER	WATER	WATER	WATER	WATER	WATER
			01/21/92	01/21/92	01/21/92	01/22/92	01/22/92	01/22/92
			20723	20723	20723	20722	20722	20722
METHOD	ANALYTE	UNIT	MPT-B-SW-1	MPT-B-SW-2	MPT-B-SW-3	MPT-B-SW-4	MPT-2-SW-4	MPT-2-SW-5
EPA310.1	ALKALINITY	mg/l	204	124	112	114	200	228
EPA110.2	COLOR	ALPHA	60	60	100	60	100	140
EPA325.1	CHLORIDE	mg/l	9130	10400	9750	4290	10800	9760
EPA130.2	HARDNESS AS CaCO3	mg/l	1640	404	1510	1370	2110	1810
EPA353.2	NITRATE/NITRITE	mg/l	0.23	0.2	0.22	0.22	0.25	0.25
EPA350.2	AMMONIA	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPA413.1	OIL & GREASE	mg/l	0.5	3.8	3.7	1.7	3.4	1.5
EPA150.1	pH	UNIT	7.4	7.3	7.3	7.3	7.4	7.5
EPA375.4	SULFATE	mg/l	686	1190	748	675	828	664
EPA376.1	SULFIDE	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPA160.1	TDS	mg/l	8700	15600	9680	9400	10700	5830
EPA351.3	TKN	mg/l	1.4	1.2	0.8	0.8	1.2	1.6
EPA365.1	TOTAL PHOSPOROUS	mg/l	0.74	1.03	0.28	0.29	0.69	0.85
EPA415.2	TOC	mg/l	15	13	12	31	31	8.6

*Blank entries indicate that sample was not analyzed for that analyte group

GENERAL WATER QUALITY: SURFACE WATER

A:\MPTDAT9.WK3		MPT-2-SW-6	MPT-2-SW-7	MPT-2-SW-7A	MPT-2-SW-8	MPT-2-SW-9
LOCATION:		WATER	WATER	WATER	WATER	WATER
SAMPLE MATRIX:		01/22/92	01/23/92	01/23/92	02/12/92	01/23/92
DATE SAMPLED:		20722	20740	20740	20902	20740
LAB NUMBER:						
METHOD	ANALYTE	UNIT				
EPA310.1	ALKALINITY	mg/l	420	424	455	370
EPA110.2	COLOR	ALPHA	200	140	100	85
EPA325.1	CHLORIDE	mg/l	8060	8340	9270	12100
EPA130.2	HARDNESS AS CaCO3	mg/l	2490	990	1690	2200
EPA353.2	NITRATE/NITRITE	mg/l	0.14	0.19	0.3	0.19
EPA350.2	AMMONIA	mg/l	3.1	1.4	3.6	3
EPA413.1	OIL & GREASE	mg/l	0.7	1.9	2	2.8
EPA150.1	pH	UNIT	7.4	7.5	7.2	7.4
EPA375.4	SULFATE	mg/l	768	815	597	764
EPA376.1	SULFIDE	mg/l	<0.1	<0.1	<0.1	<0.1
EPA160.1	TDS	mg/l	12000	12400	8790	11400
EPA351.3	TKN	mg/l	6.8	4.5	7.7	5.1
EPA365.1	TOTAL PHOSPHOROUS	mg/l	0.89	0.48	0.7	0.48
EPA415.2	TOC	mg/l	17	17		2

*Blank entries indicate that sample was not analyzed for that analyte group

Surface

Water

General H_2O

Quality

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Surface Water Sample Location MPT-B-SW-1

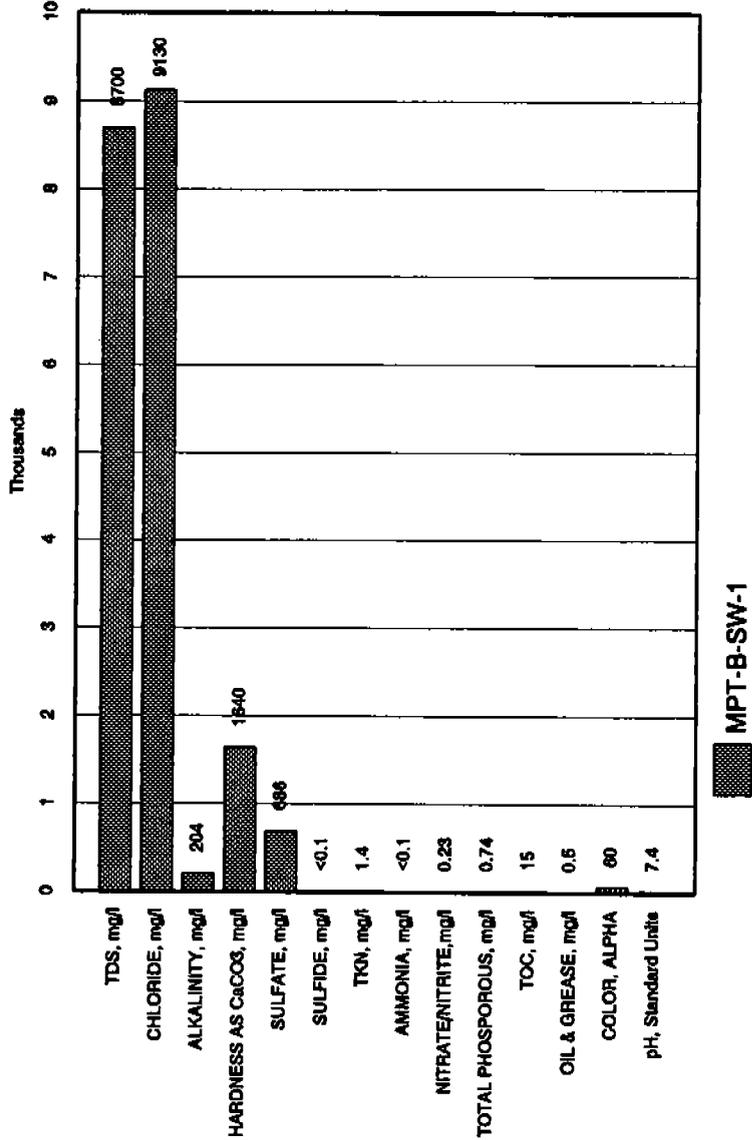


FIGURE D-1
GENERAL SURFACE WATER QUALITY AT
SAMPLE LOCATION MPT-B-SW-1
(BACKGROUND SAMPLE)



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Surface Water Sample Location MPT-B-SW-2

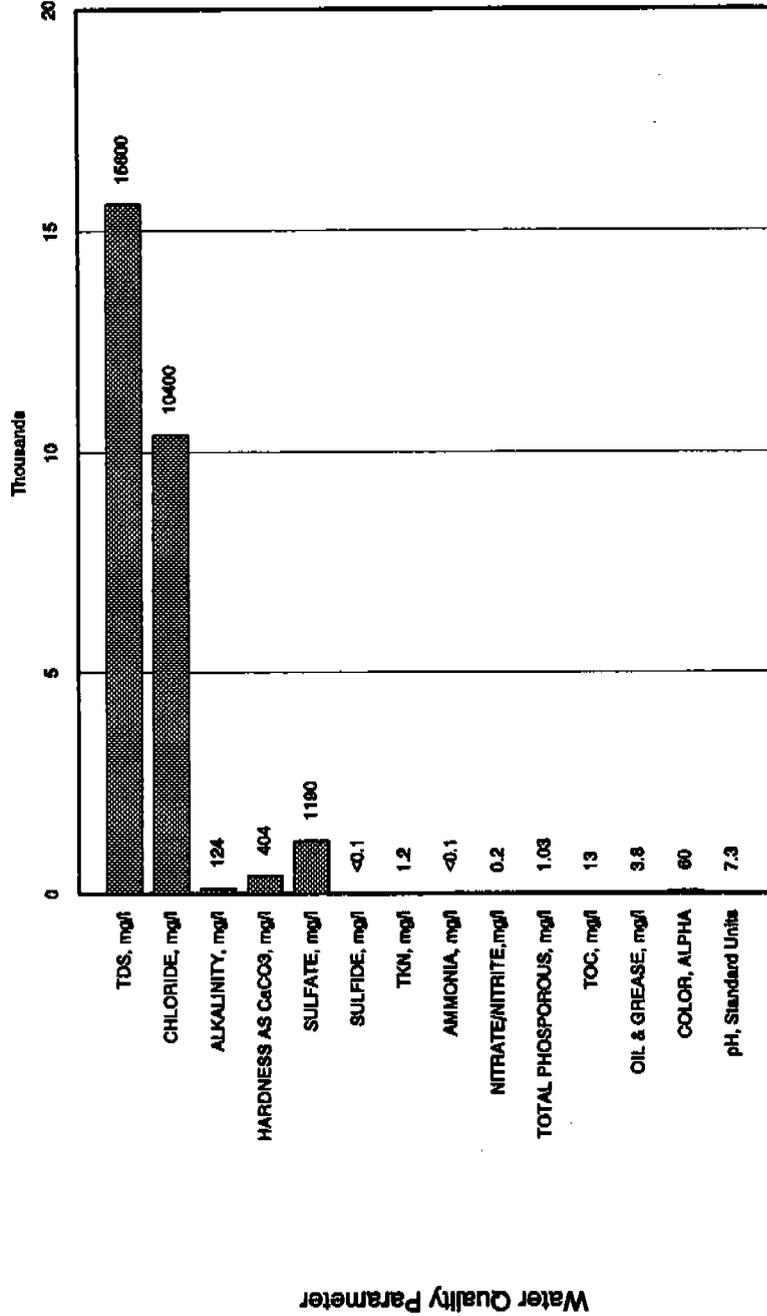


FIGURE D-2
GENERAL SURFACE WATER QUALITY AT
SAMPLE LOCATION MPT-B-SW-2
(BACKGROUND SAMPLE)



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Surface Water Sample Location MPT-B-SW-3

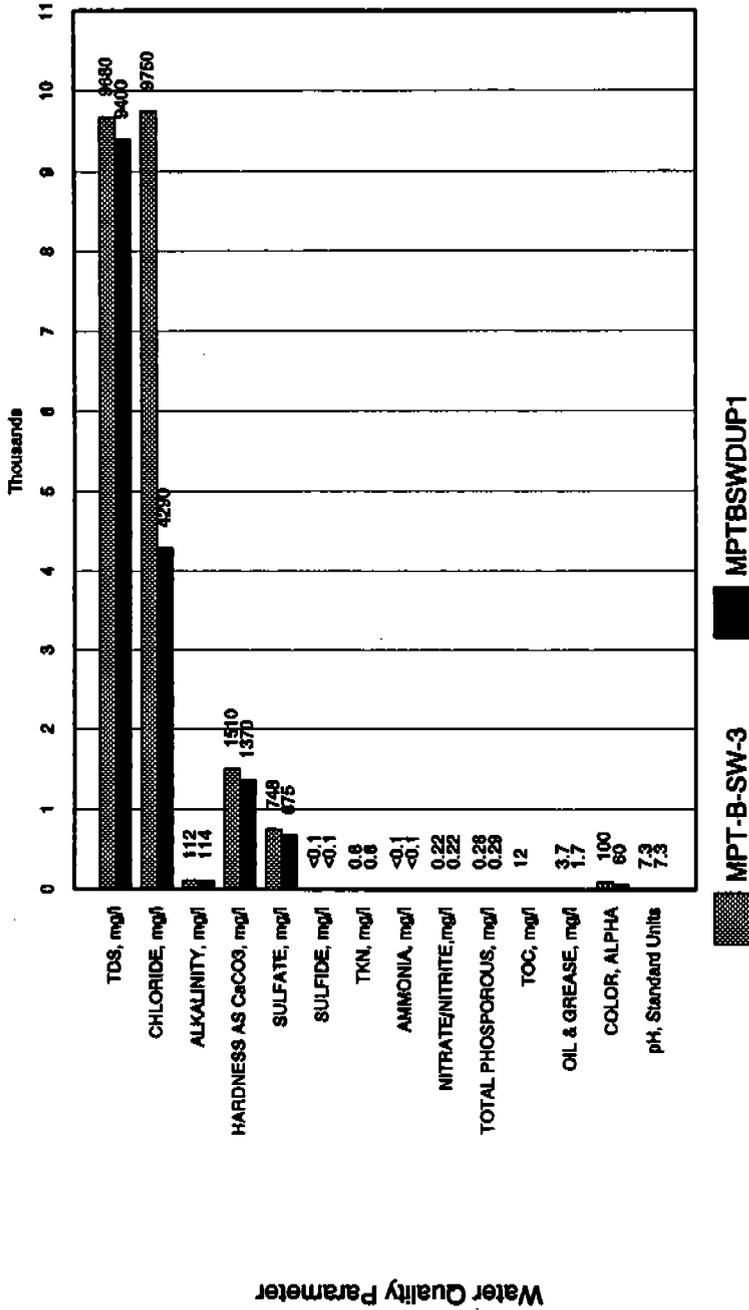


FIGURE D-3
GENERAL SURFACE WATER QUALITY AT
SAMPLE LOCATIONS MPT-B-SW-3 AND
MPT-B-SW-DUP1 (BACKGROUND SAMPLE
AND DUPLICATE SAMPLE)

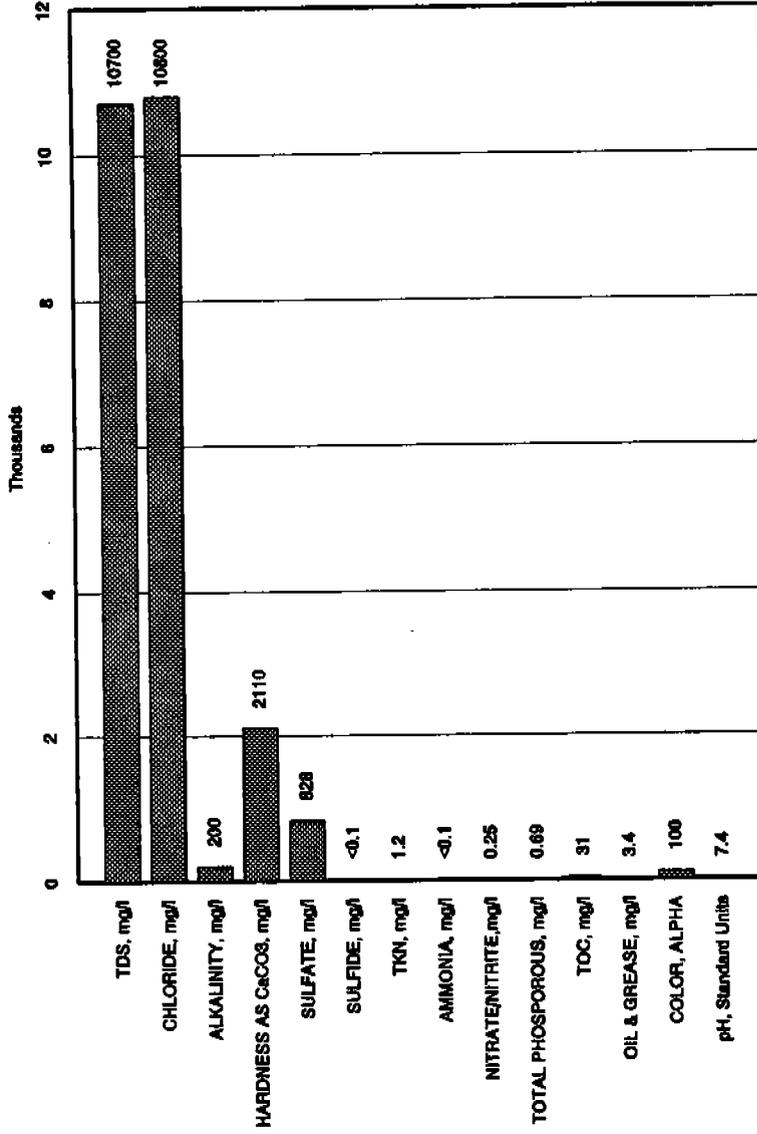


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Surface Water Sample Location MPT-2-SW-4



**FIGURE D-4
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-4**

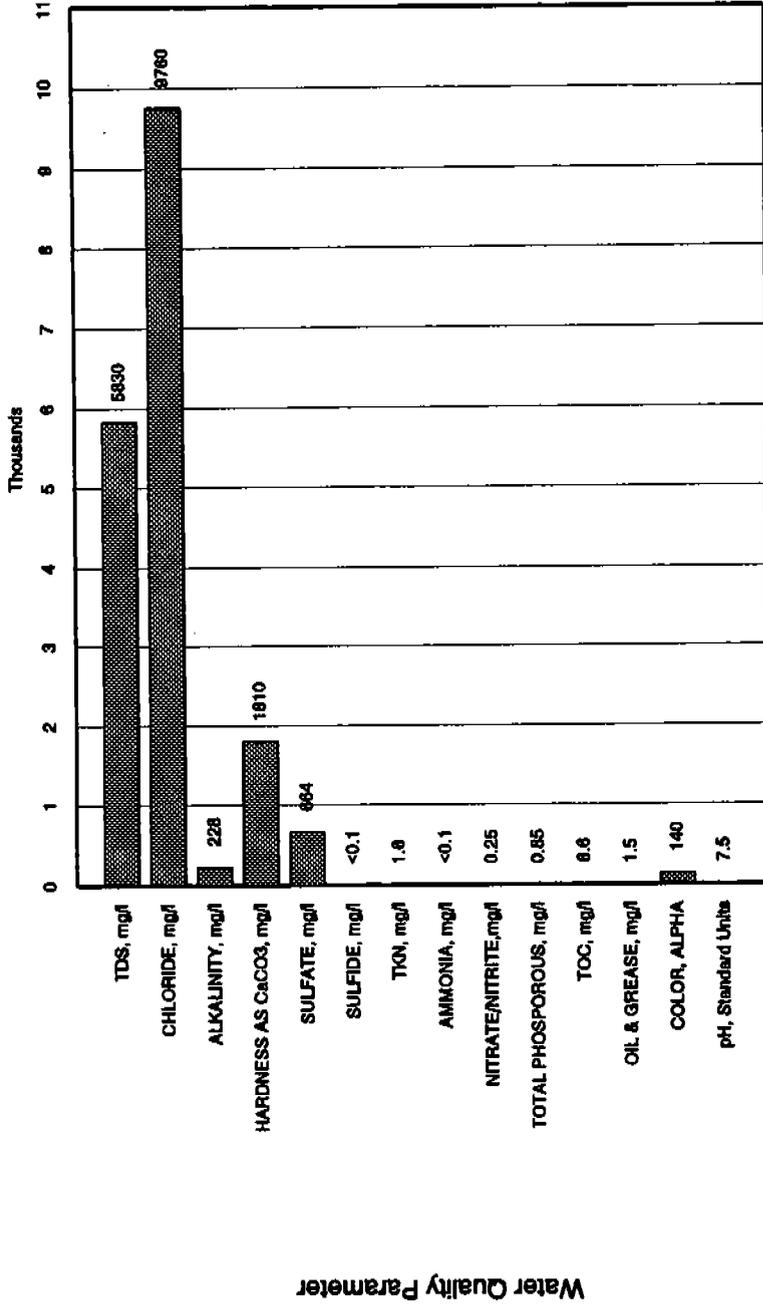


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Surface Water Sample Location MPT-2-SW-5



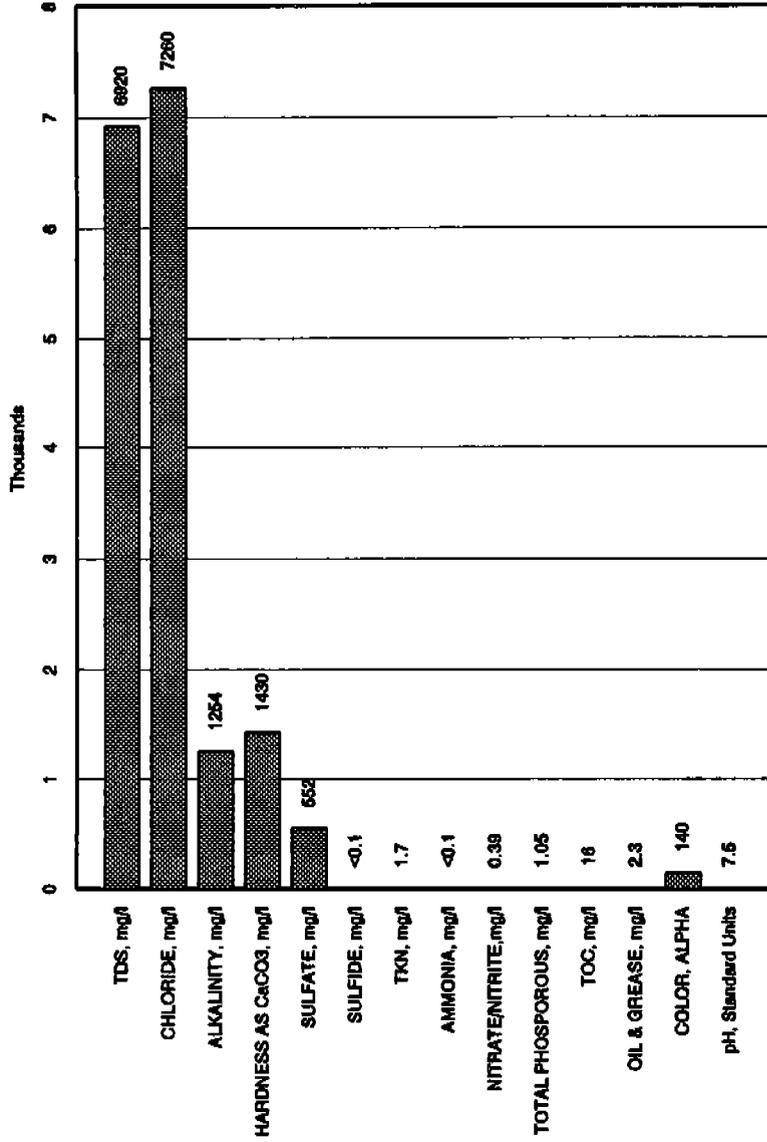
**FIGURE D-5
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-5**



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Surface Water Sample Location MPT-2-SW-6



**FIGURE D-6
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-6**

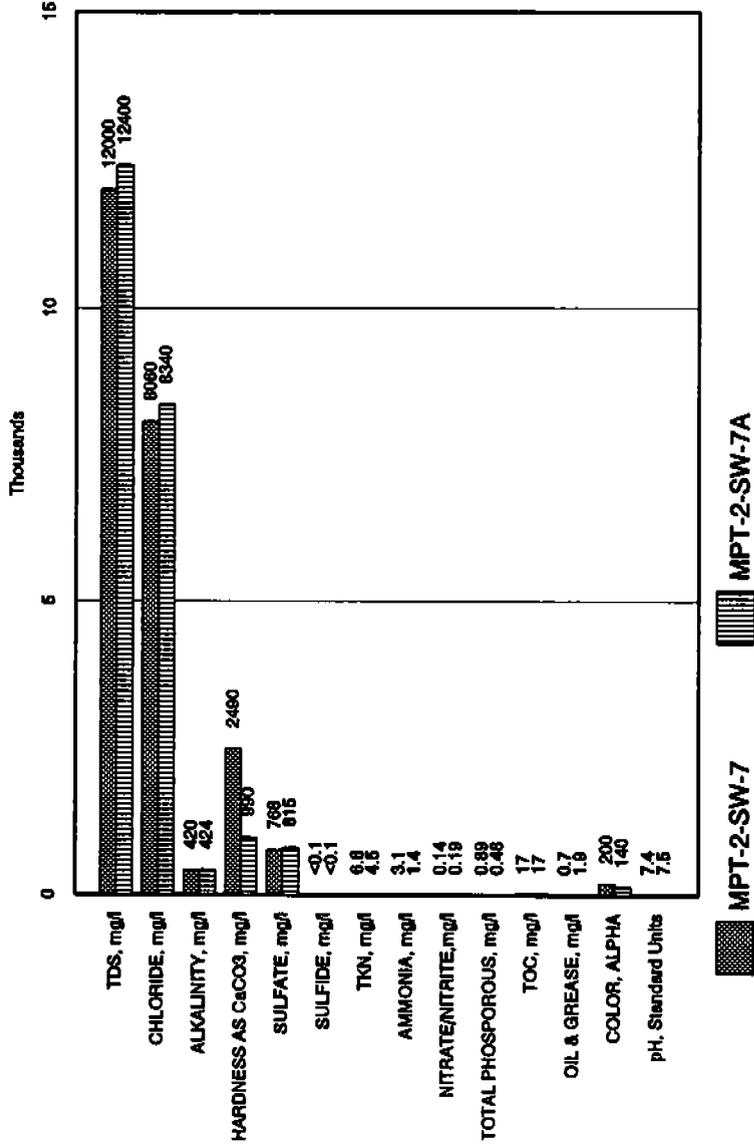


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Surface Water Sample Location MPT-2-SW-7



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FIGURE D-7
GENERAL SURFACE WATER QUALITY AT
SAMPLE LOCATION MPT-B-SW-7

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Surface Water Sample Location MPT-2-SW-8

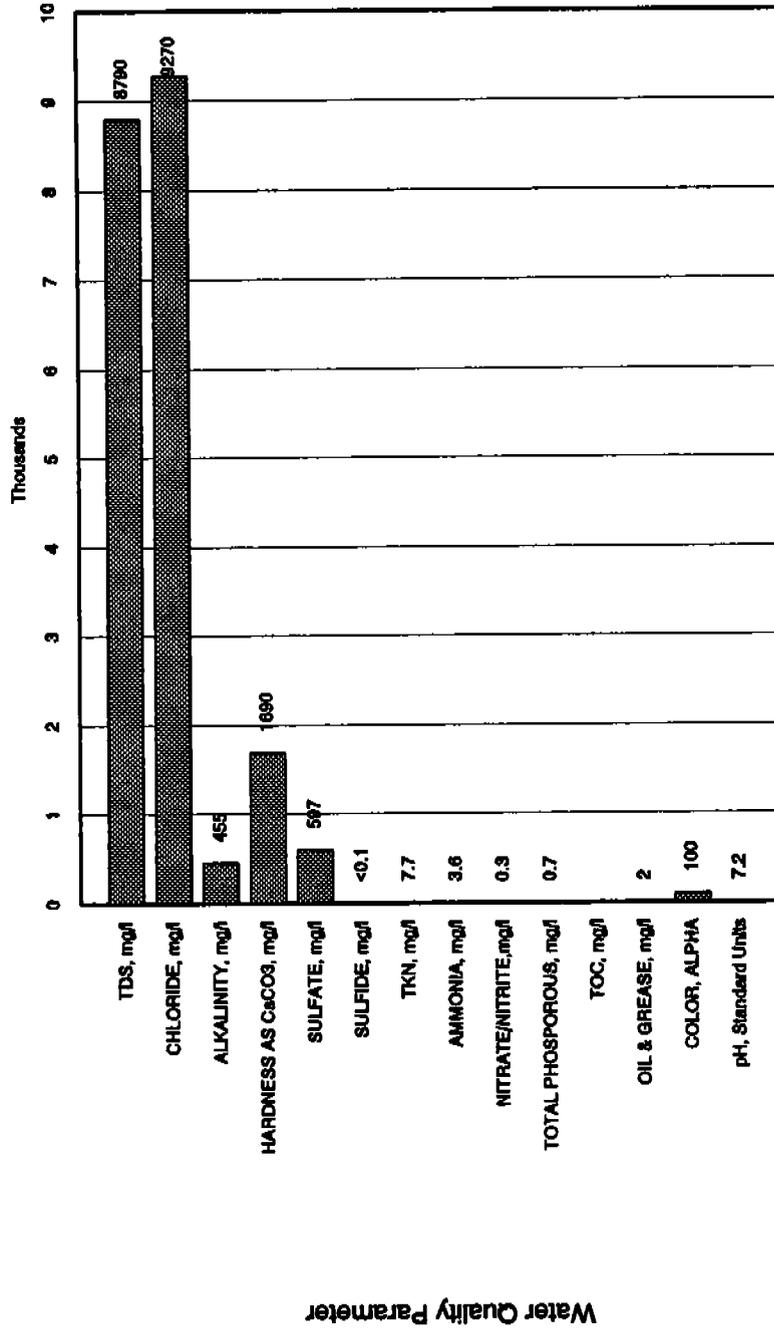


FIGURE D-8
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-8

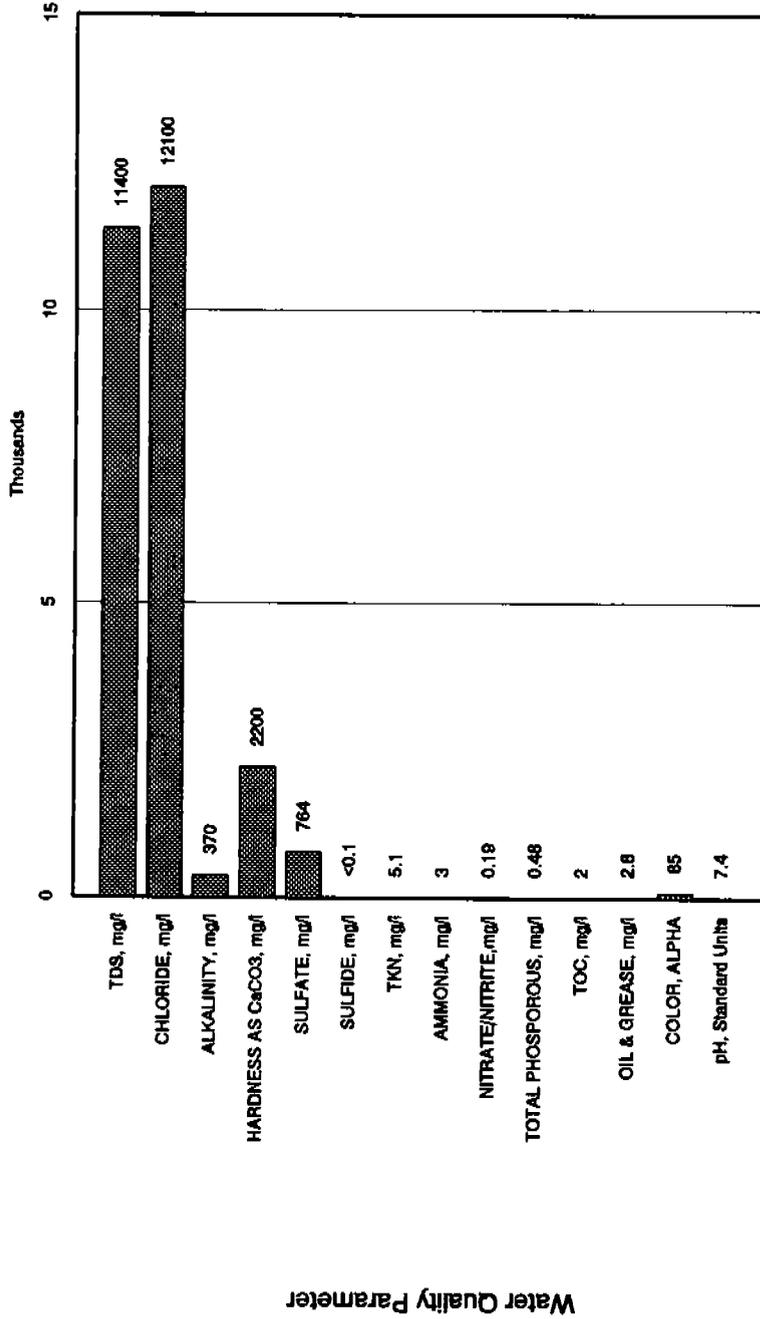


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Surface Water Sample Location MPT-2-SW-9



**FIGURE D-9
GENERAL SURFACE WATER QUALITY
AT SAMPLE LOCATION MPT-2-SW-9**



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Groundwater Sample Location MPT-1-MW1-1

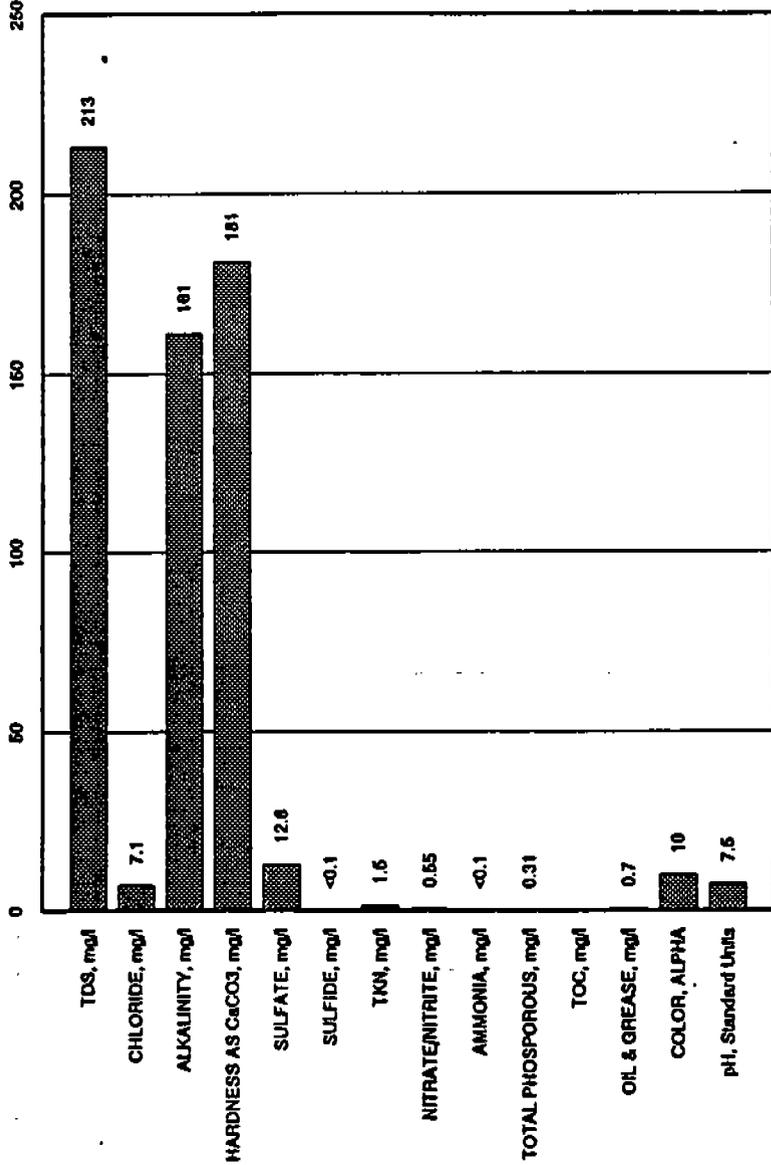


FIGURE D-10
GENERAL WATER QUALITY DATA FROM
BACKGROUND MONITORING WELL
MPT-1-MW1



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Groundwater Sample Location MPT-2-MW1-1

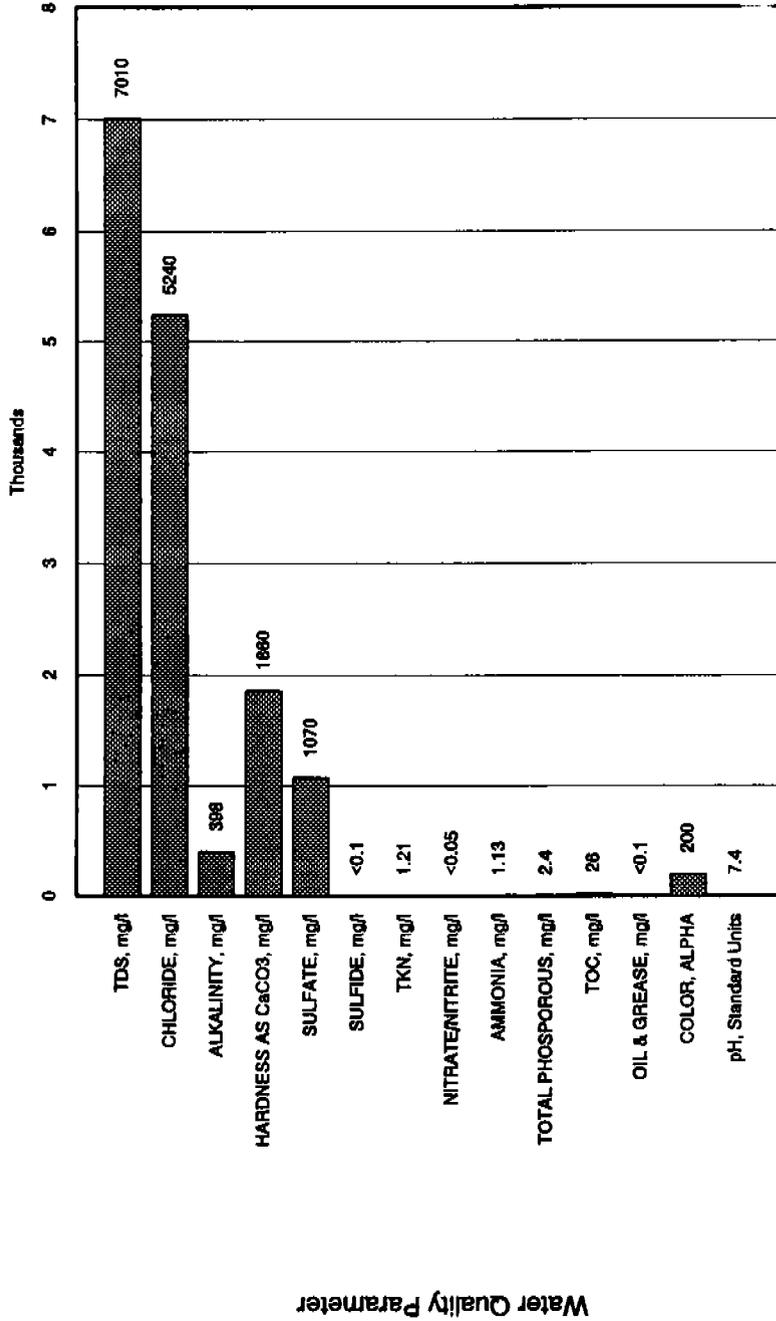


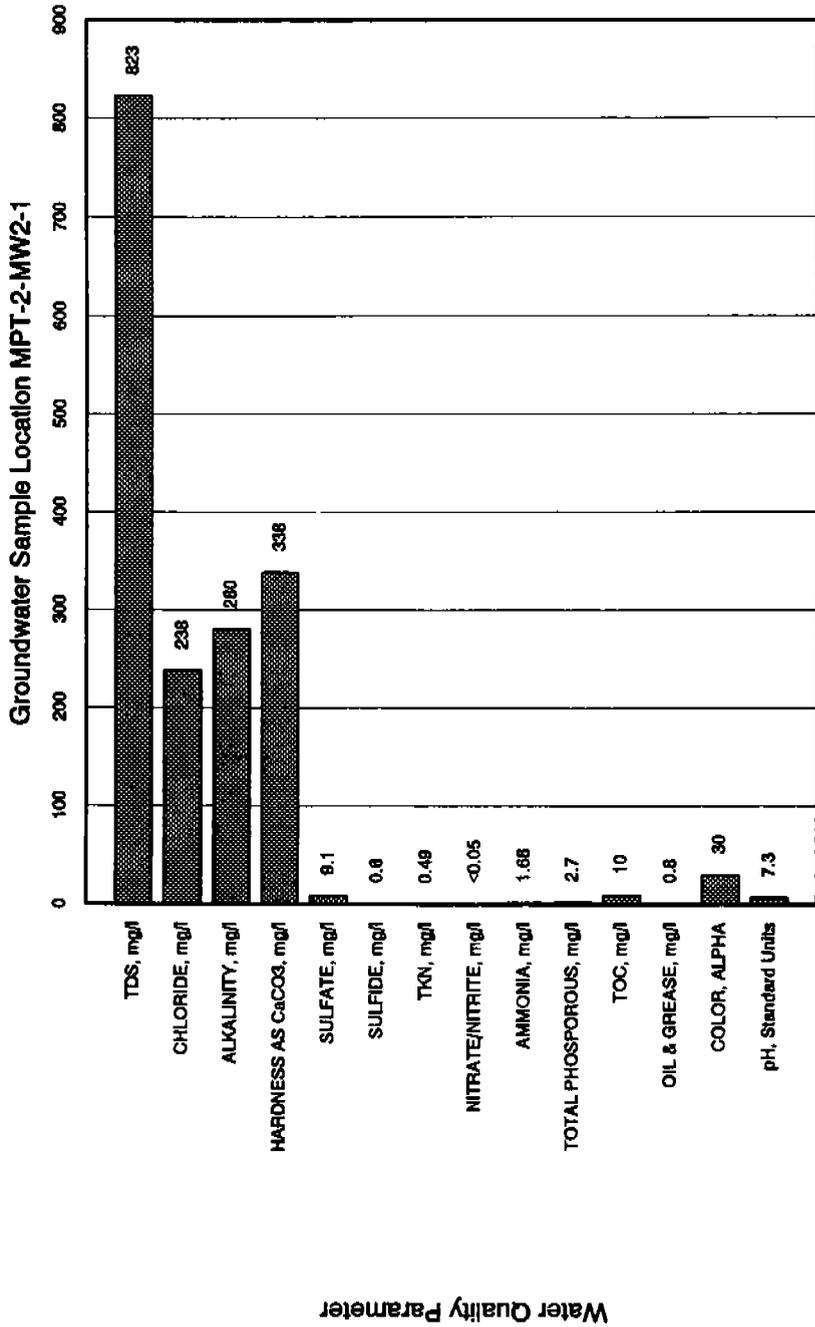
FIGURE D-11
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-2-MW1



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**FIGURE D-12
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-2-MW2**

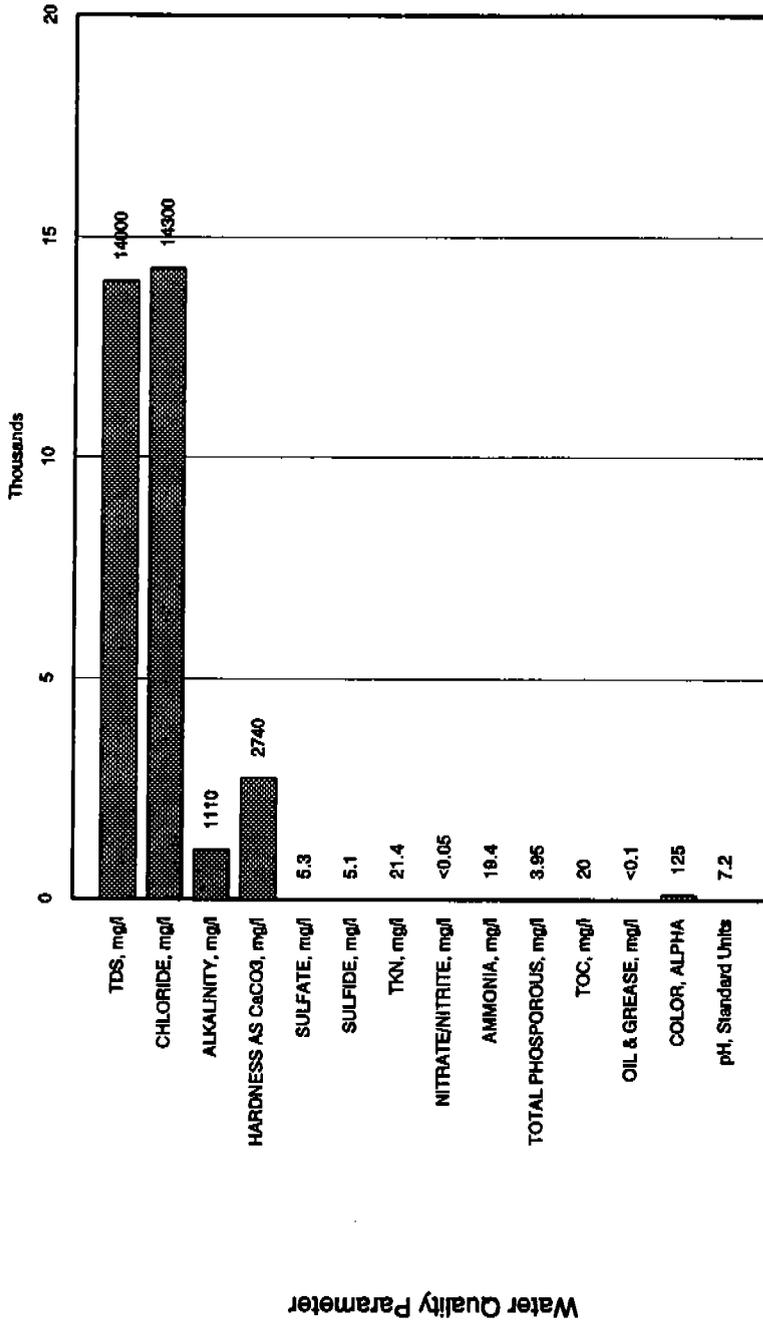


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Groundwater Sample Location MPT-2-MW3-1



**FIGURE D-13
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-2-MW3**

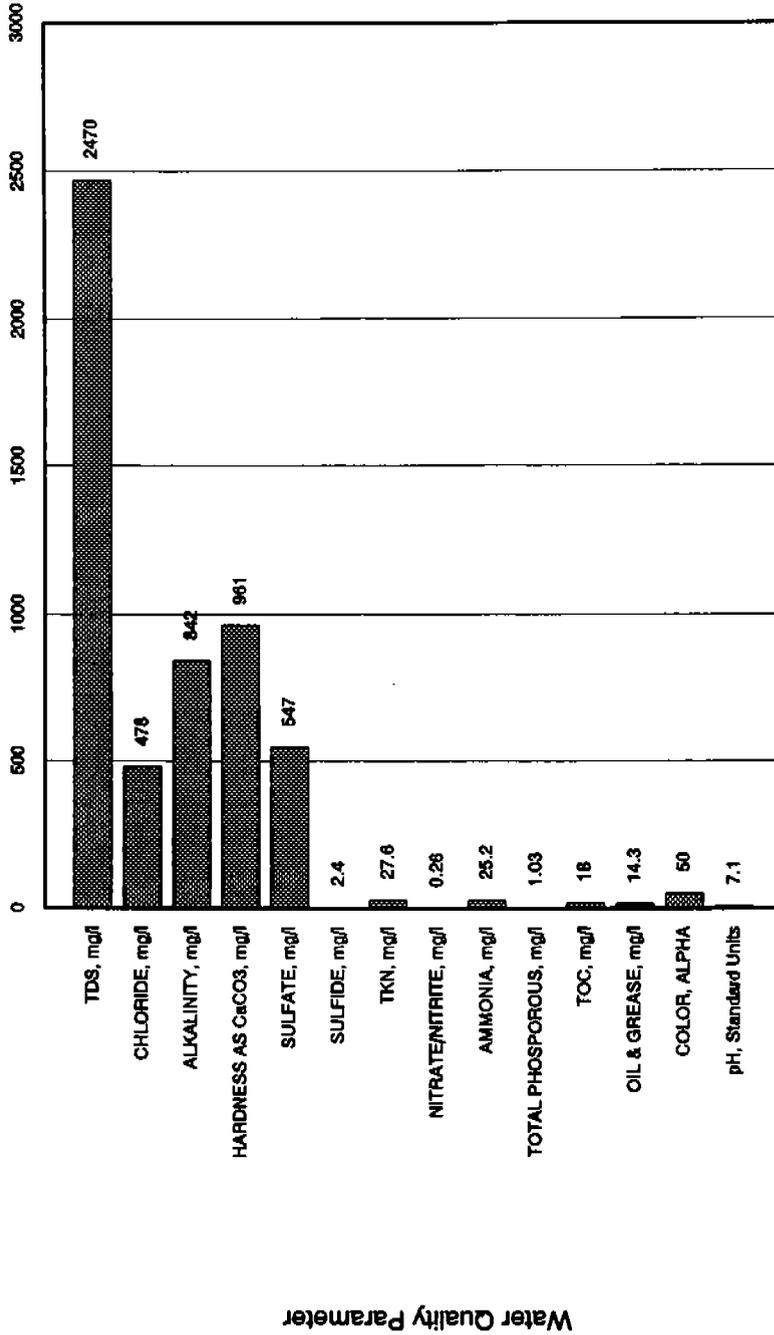


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Groundwater Sample Location MPT-2-MW4-1



**FIGURE D-14
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-2-MW4**

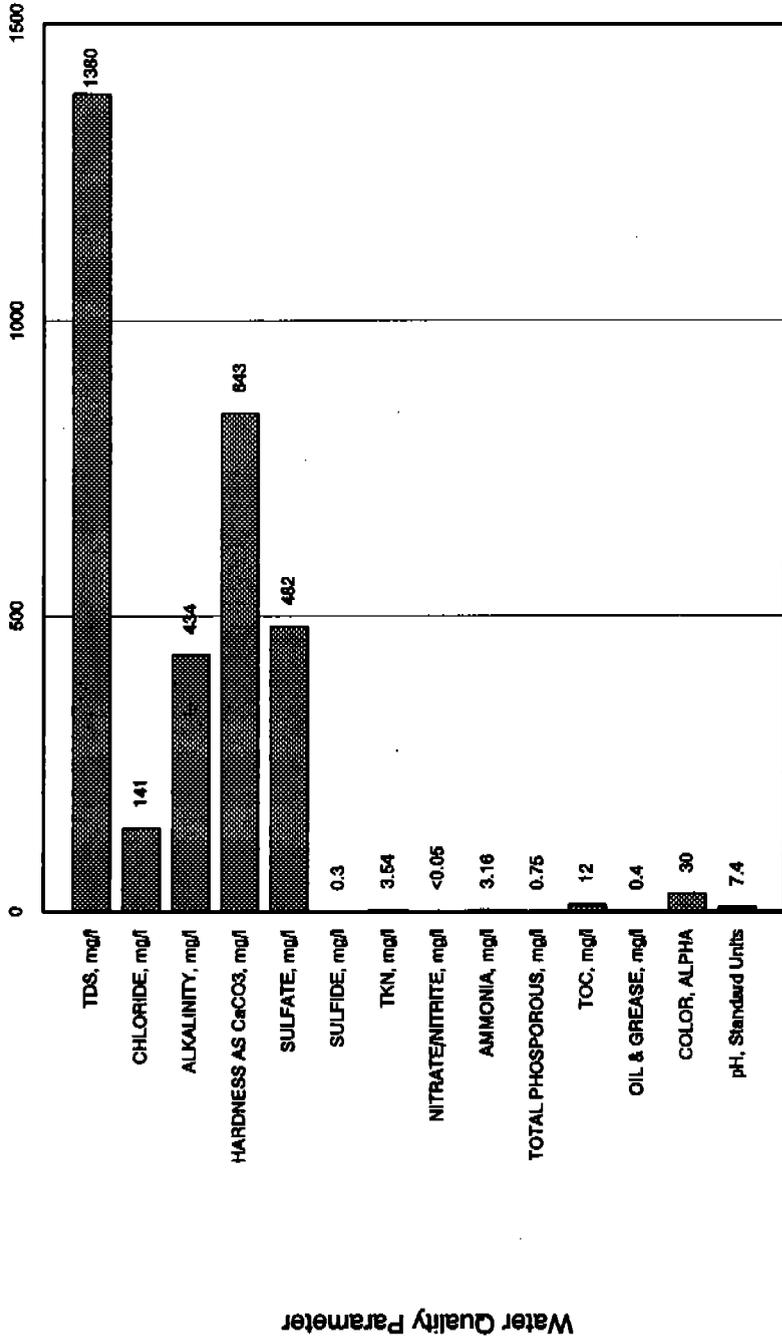


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Groundwater Sample Location MPT-2-MW5-1



**FIGURE D-15
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-2-MW5**



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Groundwater Sample Location MPT-2-MW6-1

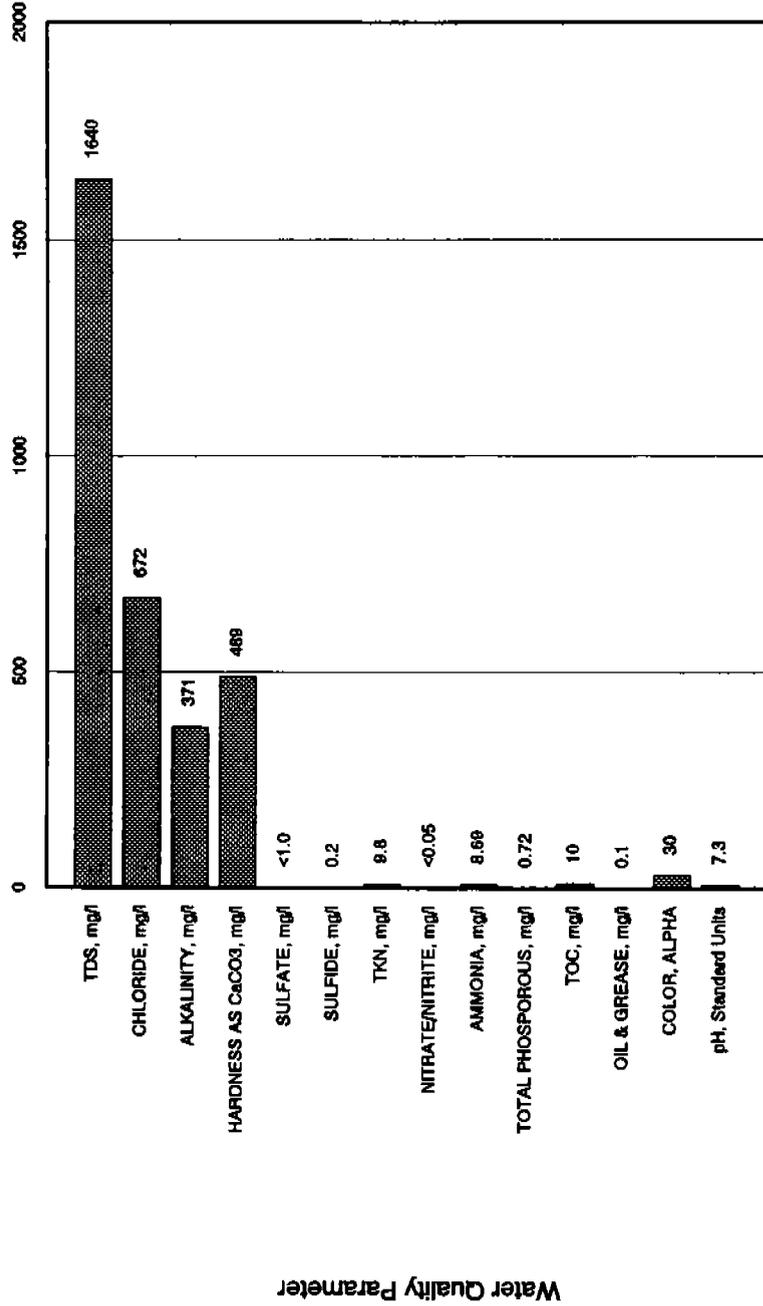


FIGURE D-16
GENERAL WATER QUALITY DATA
FROM MONITORING WELL MPT-2-MW6

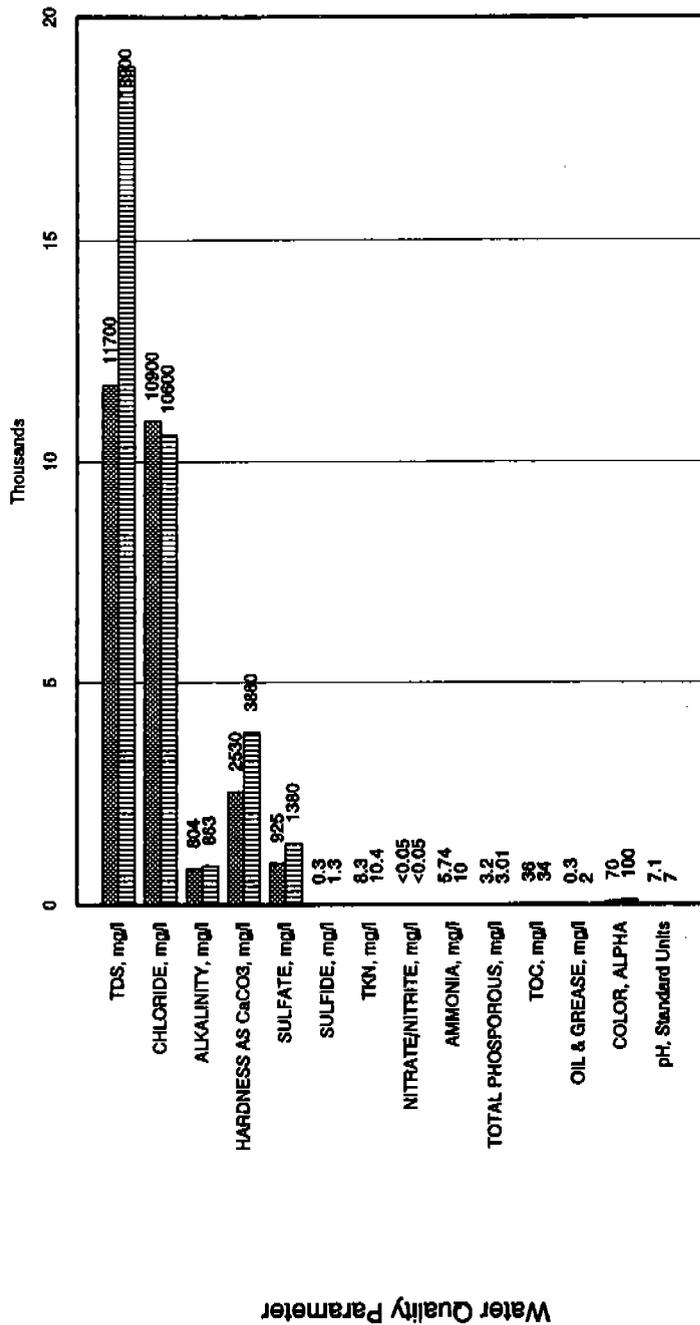


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Groundwater Sample Location MPT-2-MW7S-1 and MPT-2-MW7D-1



MPT-2-MW7S
 MPT-2-MW7D

**FIGURE D-17
GENERAL WATER QUALITY DATA FROM
MONITORING WELLS MPT-2-MW7S AND
MPT-2-MW7D**



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Groundwater Sample Location MPT-2-MW8-1

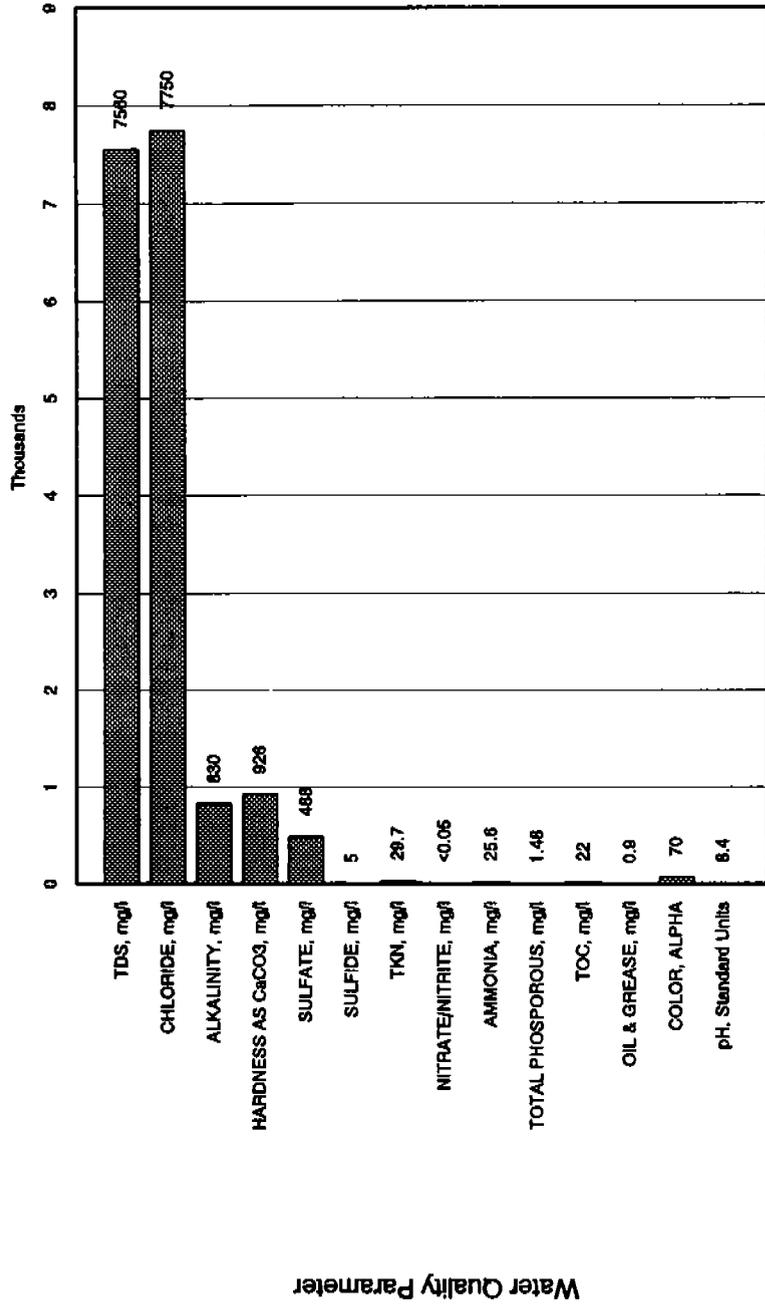


FIGURE D-18
GENERAL WATER QUALITY DATA
FROM MONITORING WELL MPT-2-MWS

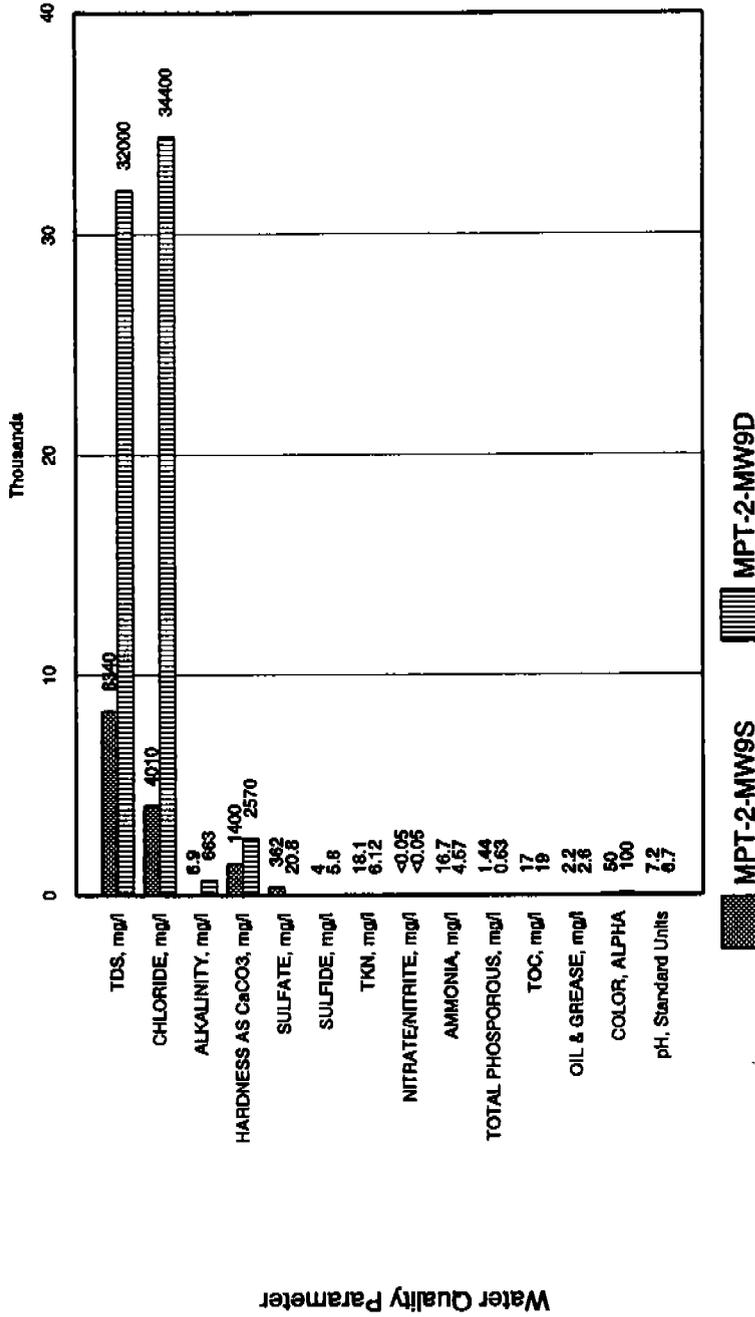


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Groundwater Sample Location MPT-2-MW9S-1 and MPT-2-MW9D-1



**FIGURE D-19
GENERAL WATER QUALITY DATA FROM
MONITORING WELLS MPT-2-MW9S AND
MPT-2-MW9D**

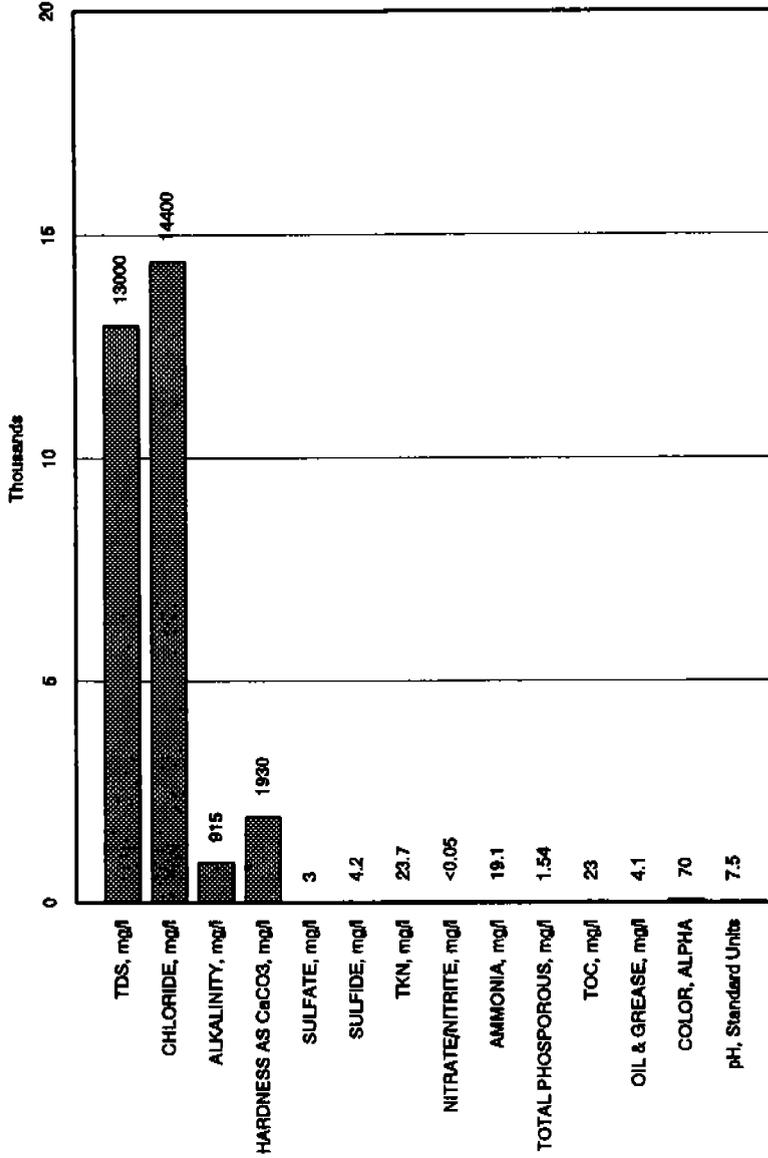


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Groundwater Sample Location MPT-2-MW10-1



**FIGURE D-20
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-2-MW10**

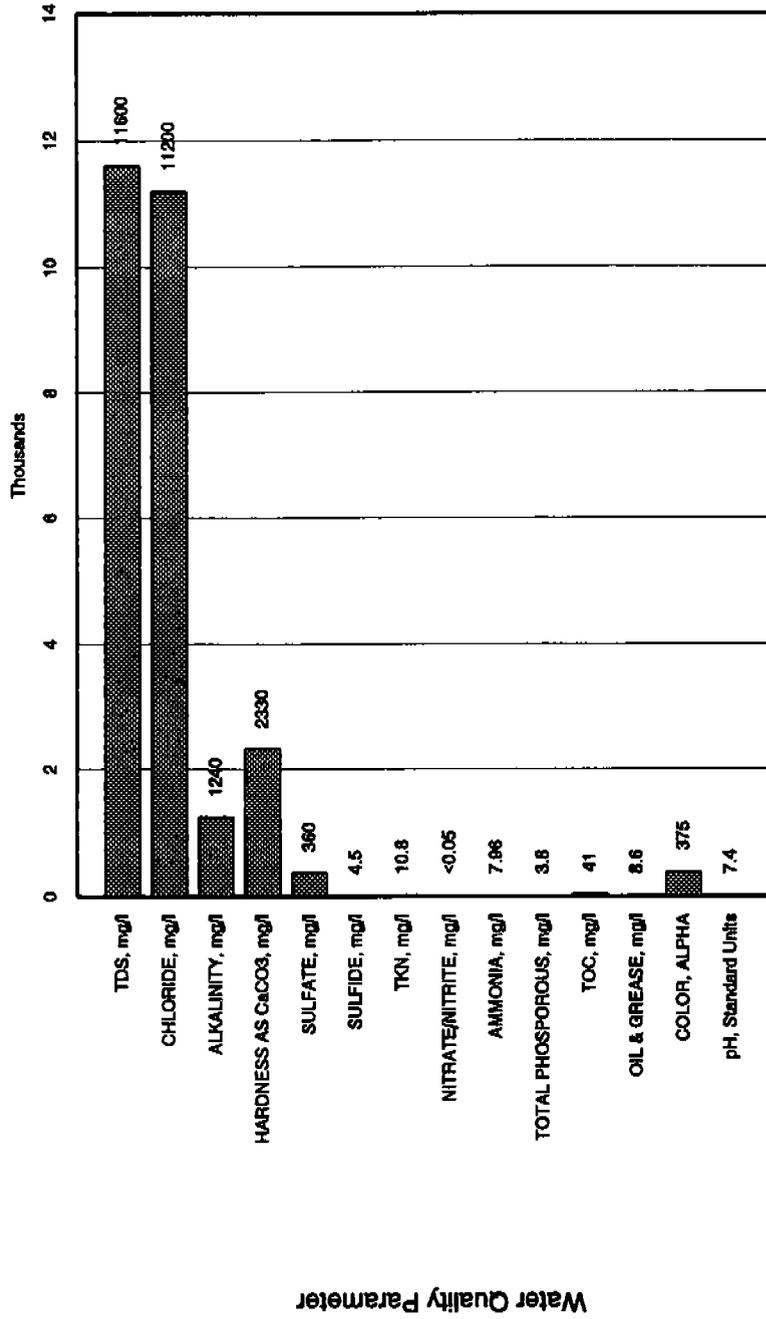


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Groundwater Sample Location MPT-2-MW11-1



**FIGURE D-21
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-2-MW11**



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Groundwater Sample Location MPT-2-MW12S-1 and MPT-2-MW12D-1

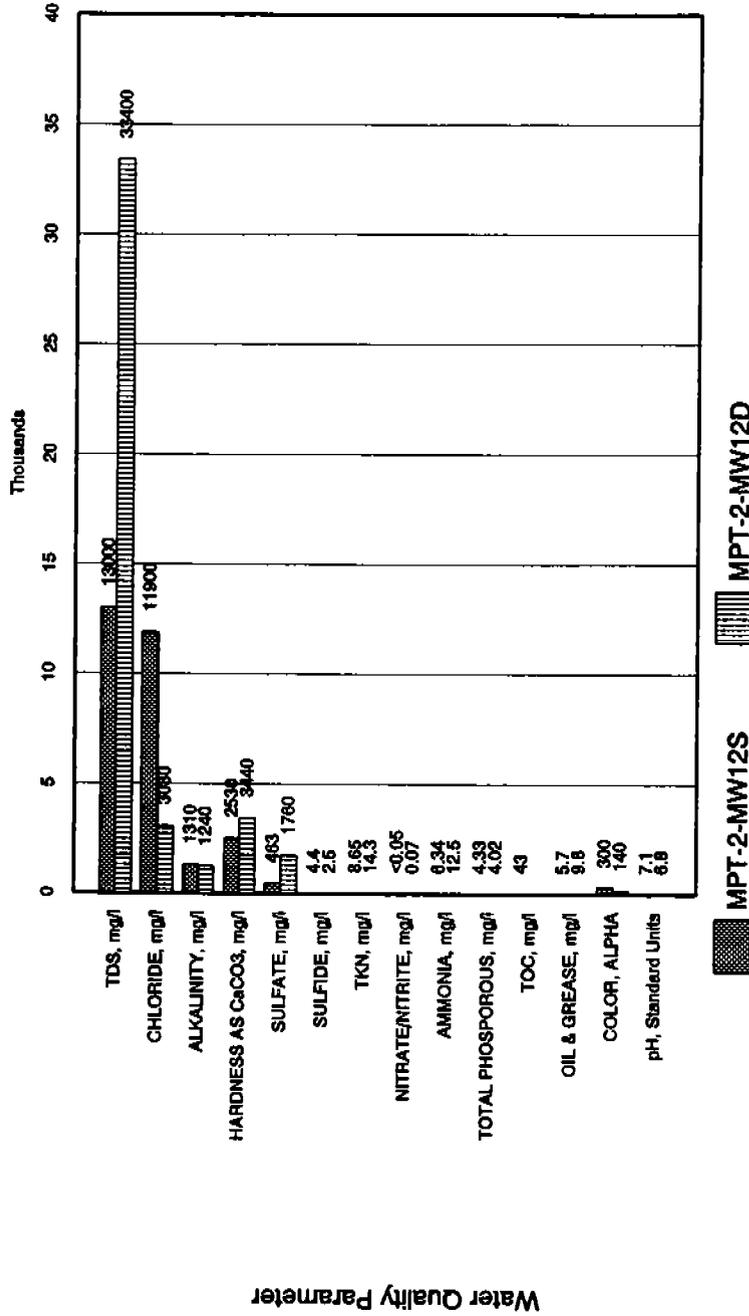


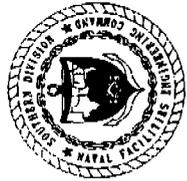
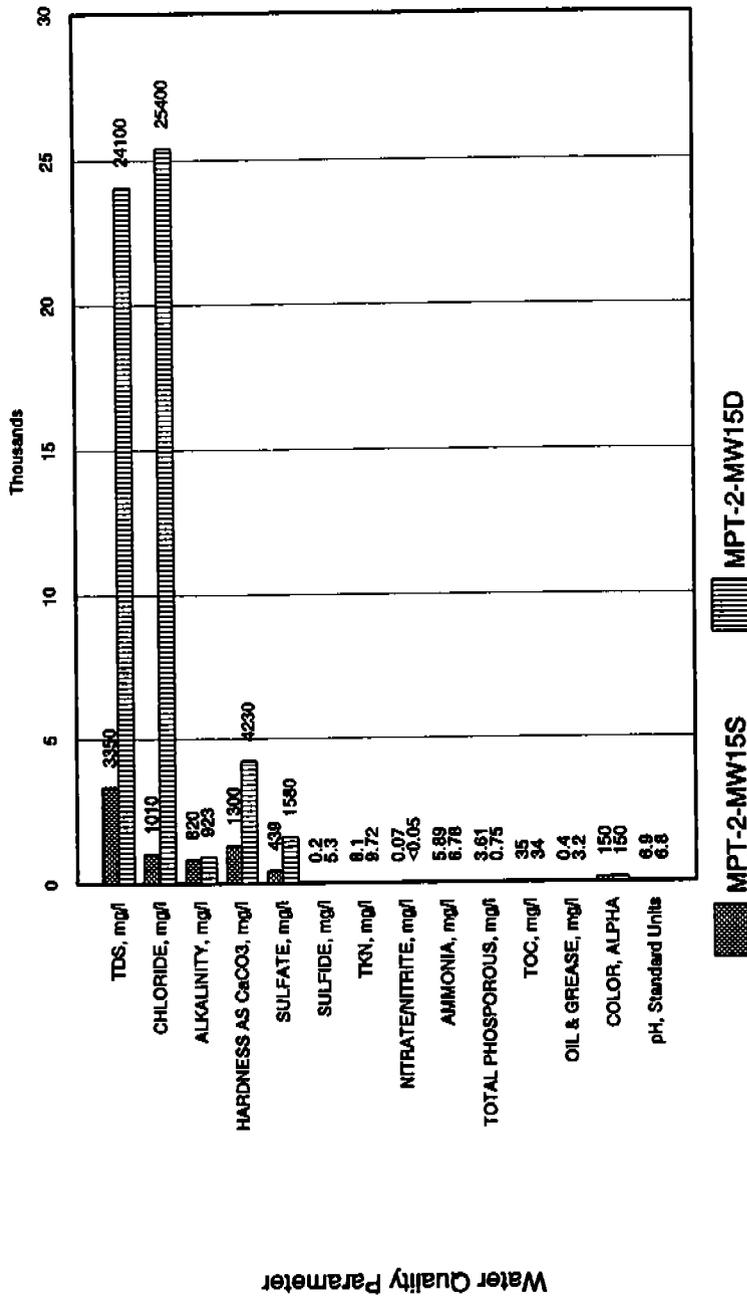
FIGURE D-22
GENERAL WATER QUALITY DATA FROM
MONITORING WELLS MPT-2-MW12S AND
MPT-2-MW12D



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Groundwater Sample Location MPT-2-MW15S-1 and MPT-2-MW15D-1



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FIGURE D-23
GENERAL WATER QUALITY DATA FROM
MONITORING WELLS MPT-2-MW15S AND
MPT-2-MW15D

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Groundwater Sample Location MPT-2-MW16S-1 and MPT-2-MW16DD-1

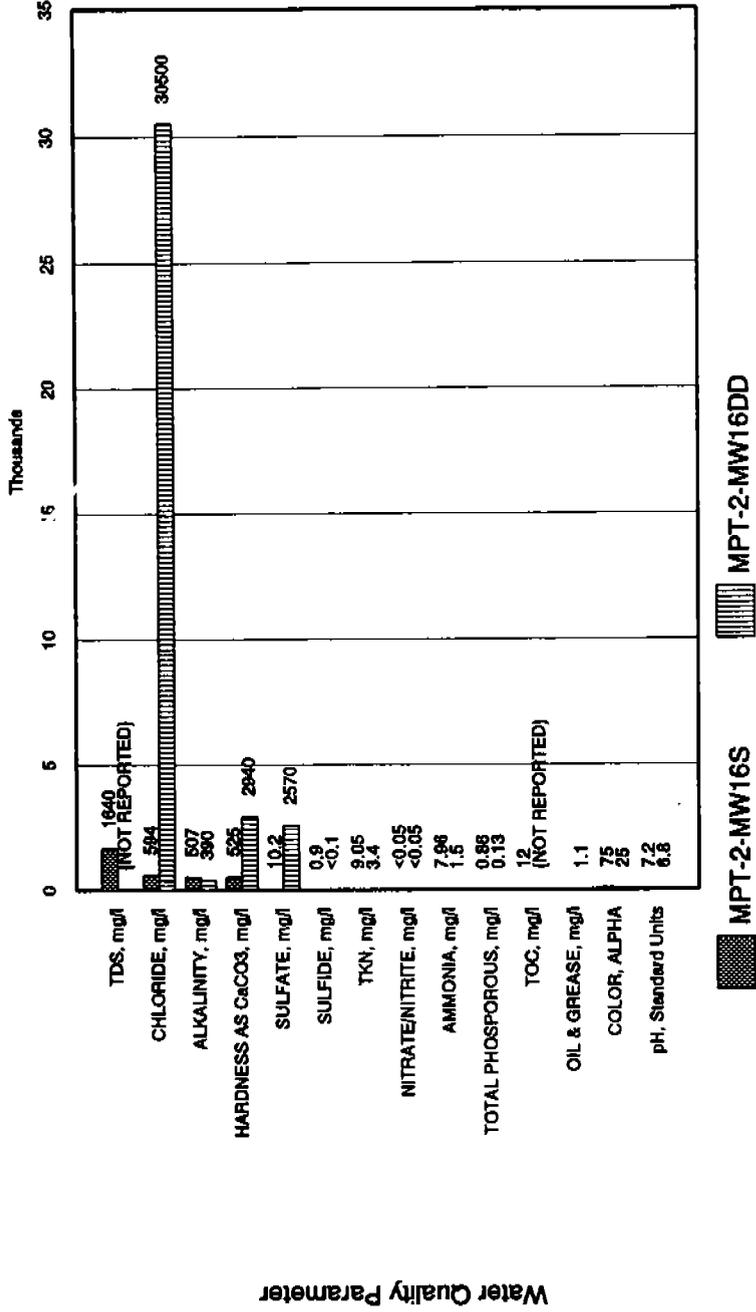


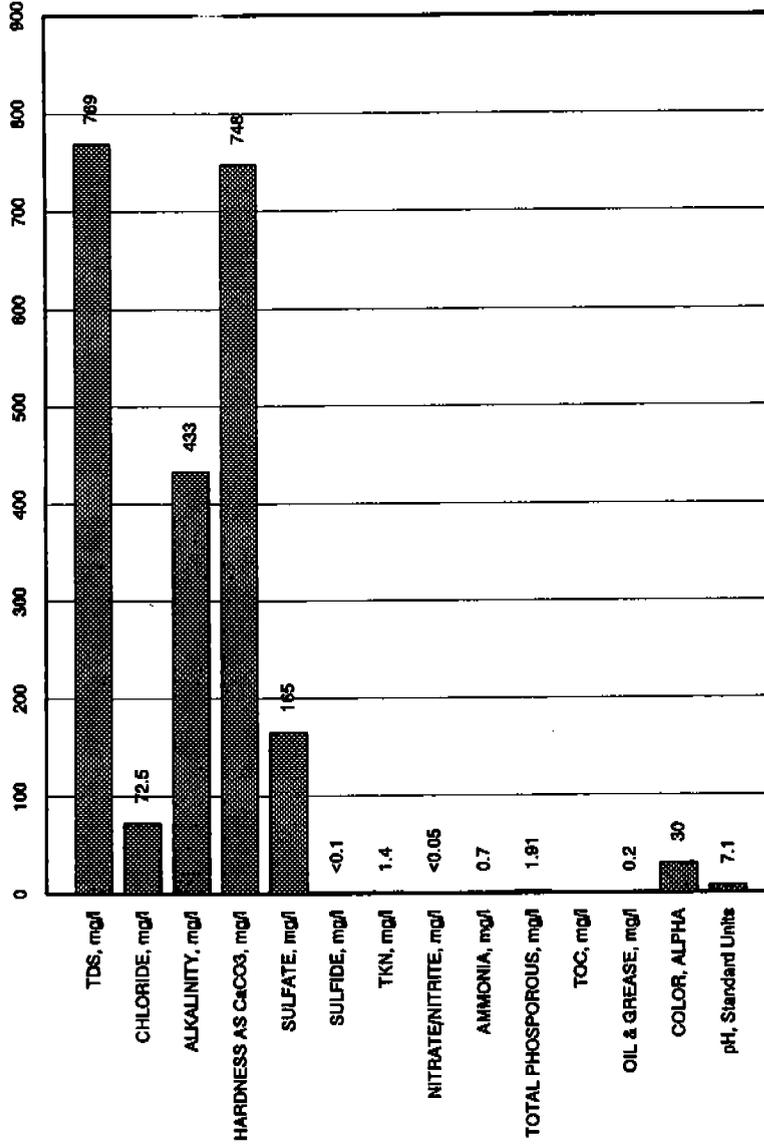
FIGURE D-24
GENERAL WATER QUALITY DATA FROM
MONITORING WELLS MPT-2-MW16S AND
MPT-2-MW16DD



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Groundwater Sample Location MPT-2-MW17S-1



**FIGURE D-25
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-2-MW17S**

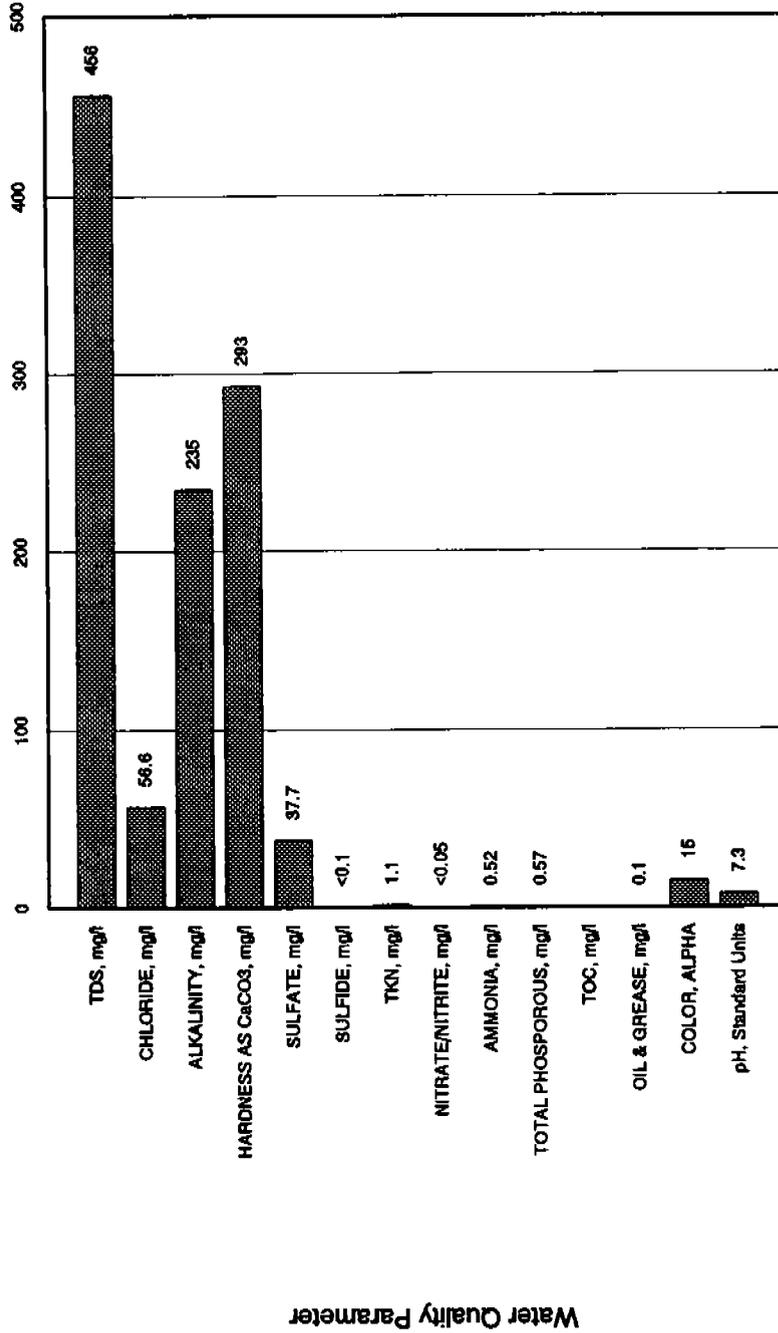


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Groundwater Sample Location MPT-13-MW1-1



**FIGURE D-26
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-13-MW1**

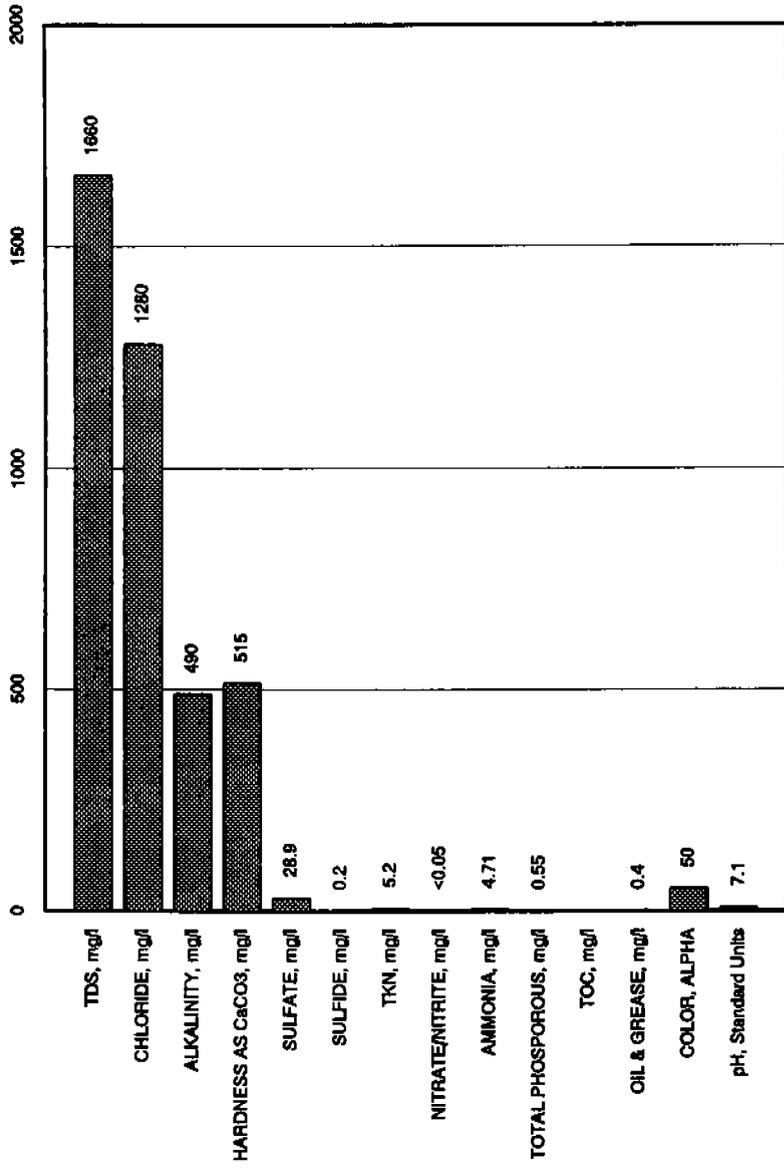


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Groundwater Sample Location MPT-13-MW2-1



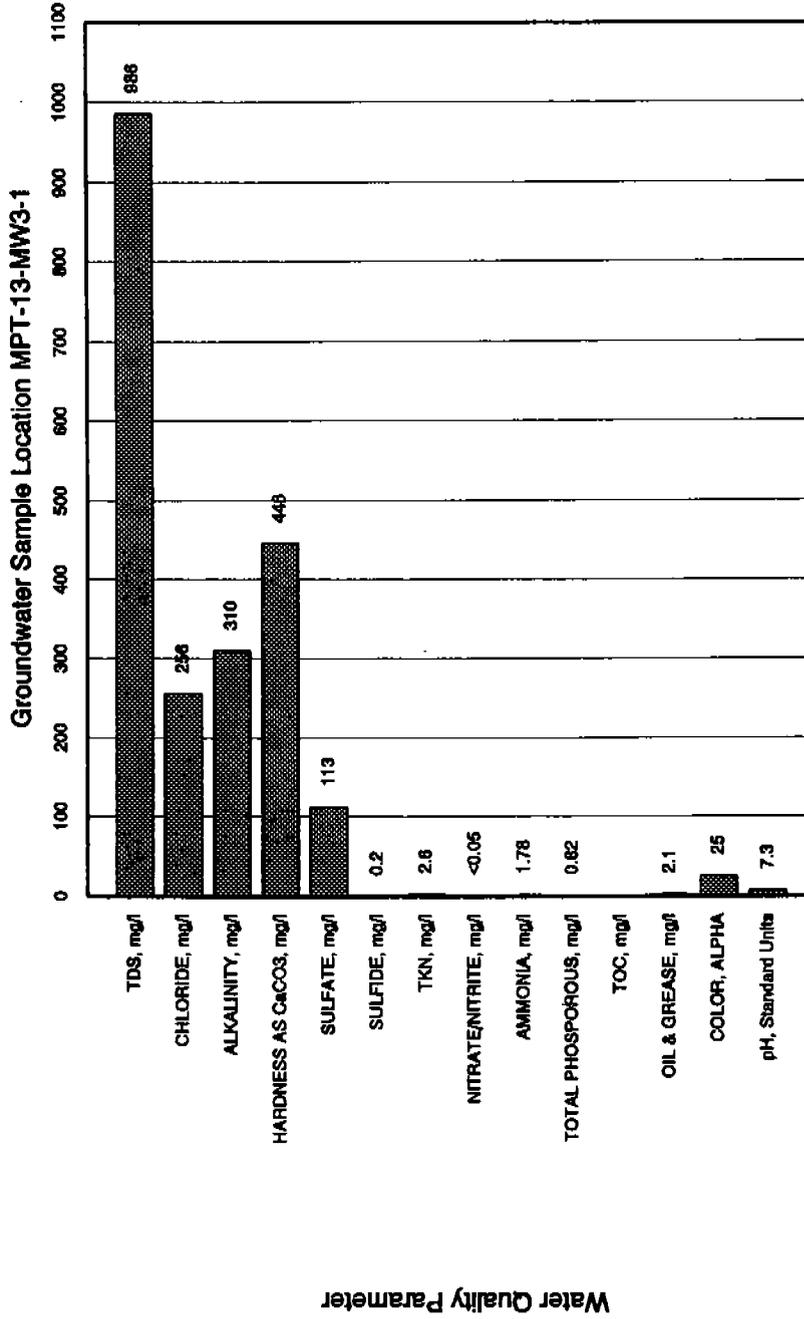
**FIGURE D-27
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-13-MW2**



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FIGURE D-28
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-13-MW3

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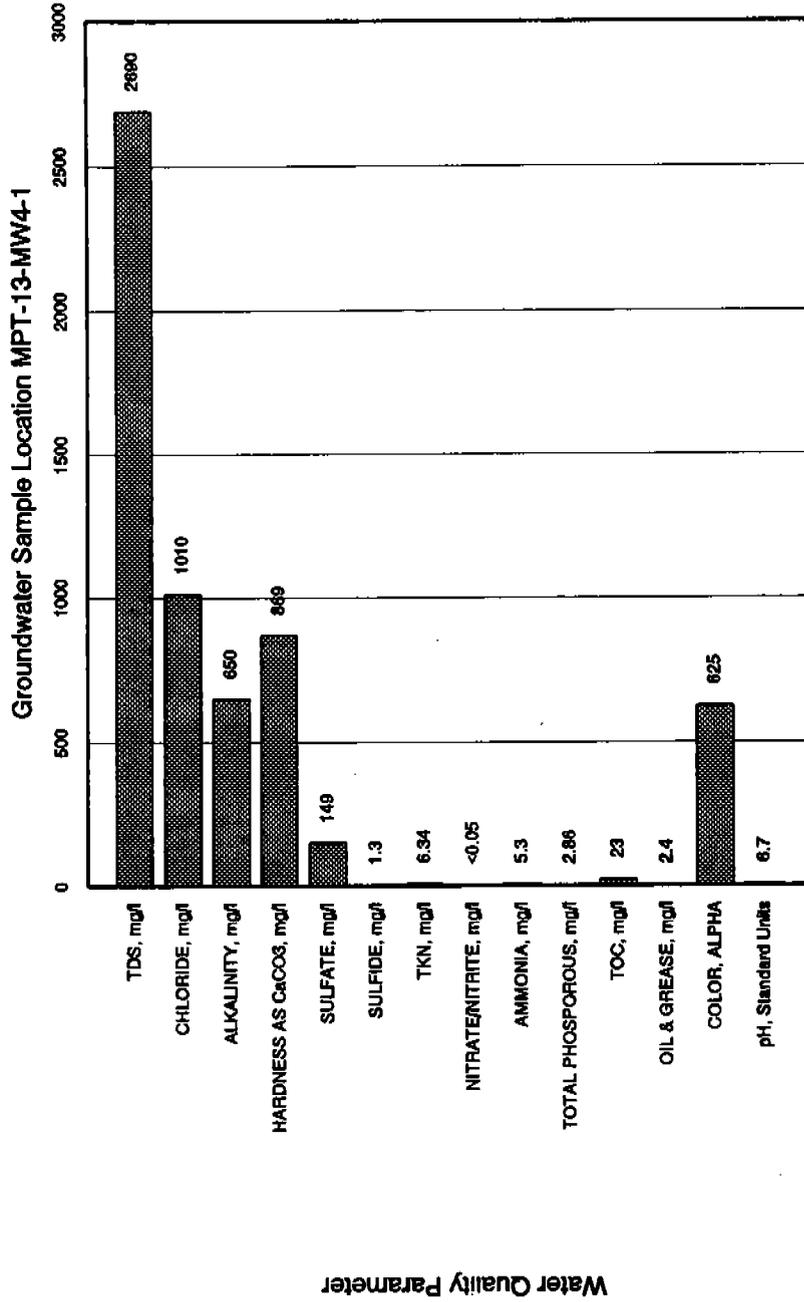


FIGURE D-29
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-13-MW4

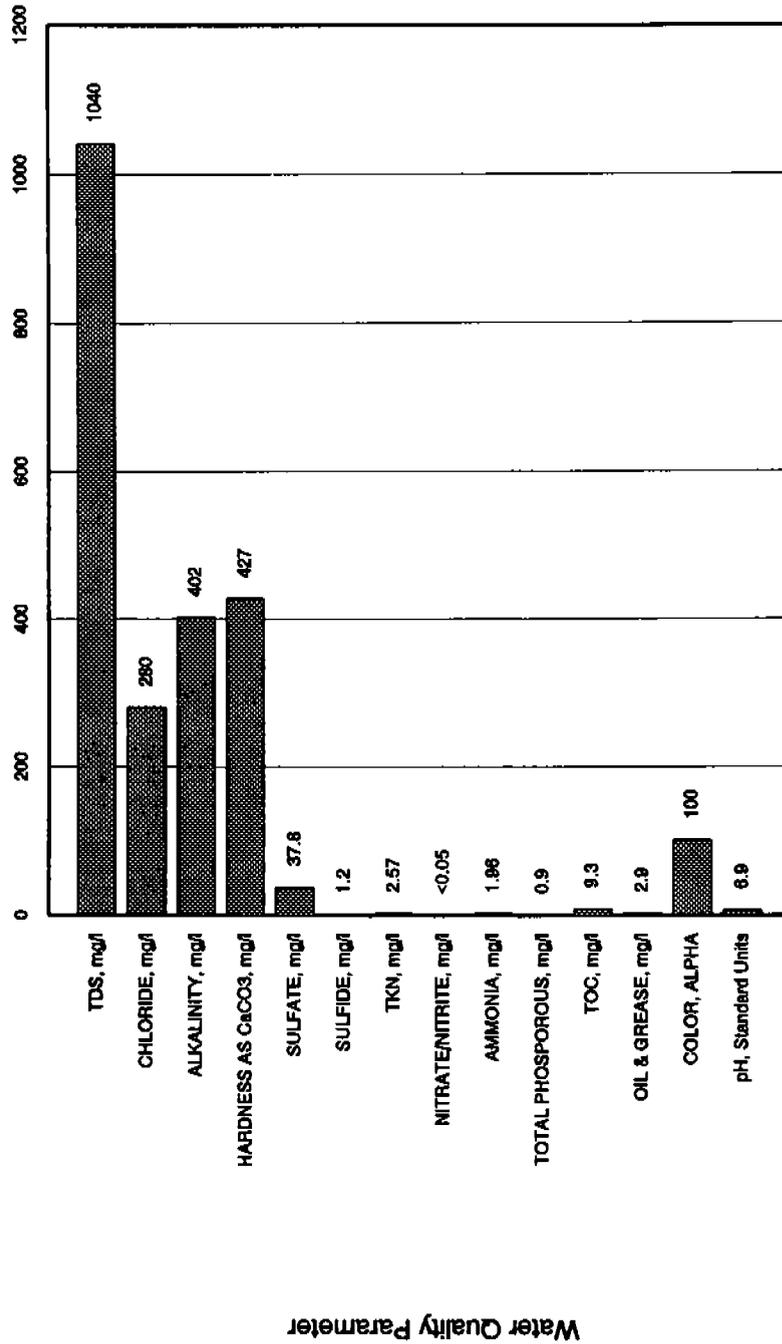


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Groundwater Sample Location MPT-13-MW5-1



**FIGURE D-30
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-13-MW5**

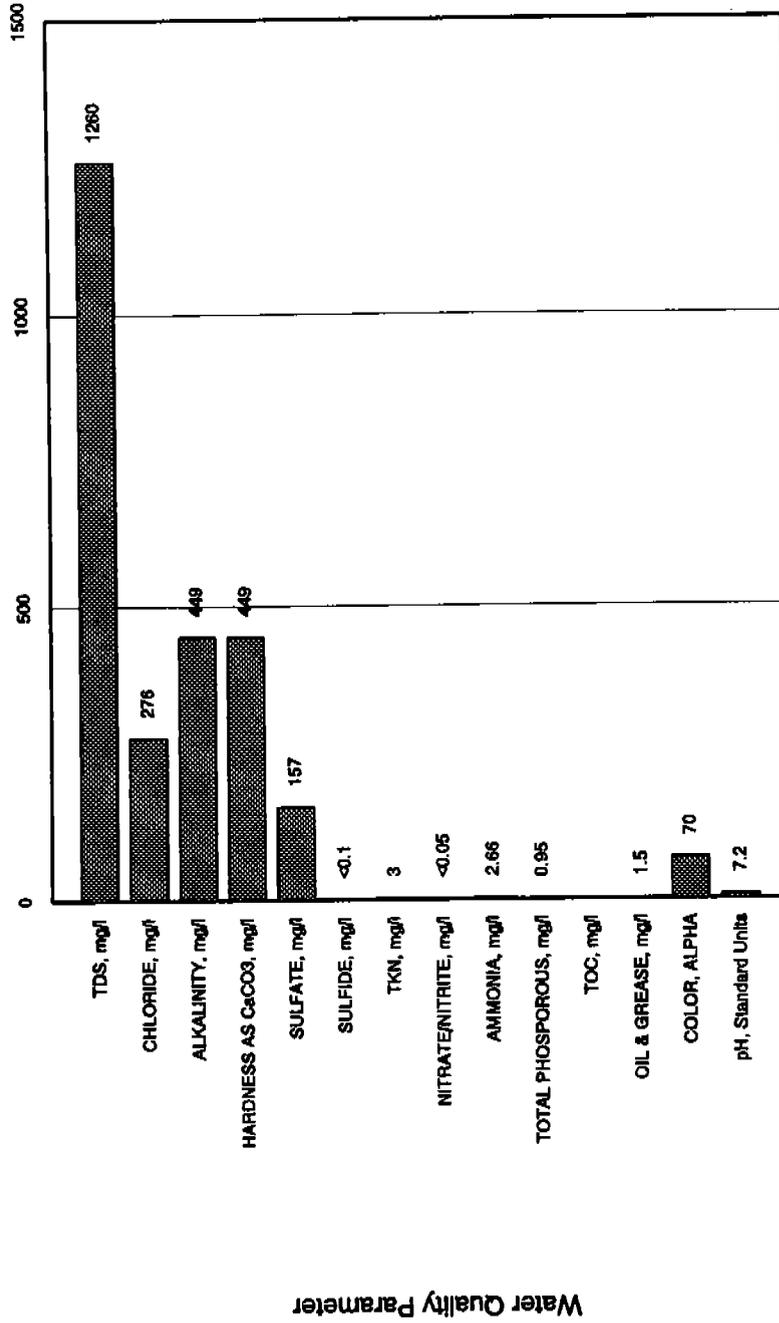


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Groundwater Sample Location MPT-13-MW6-1



**FIGURE D-31
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-13-MW6**

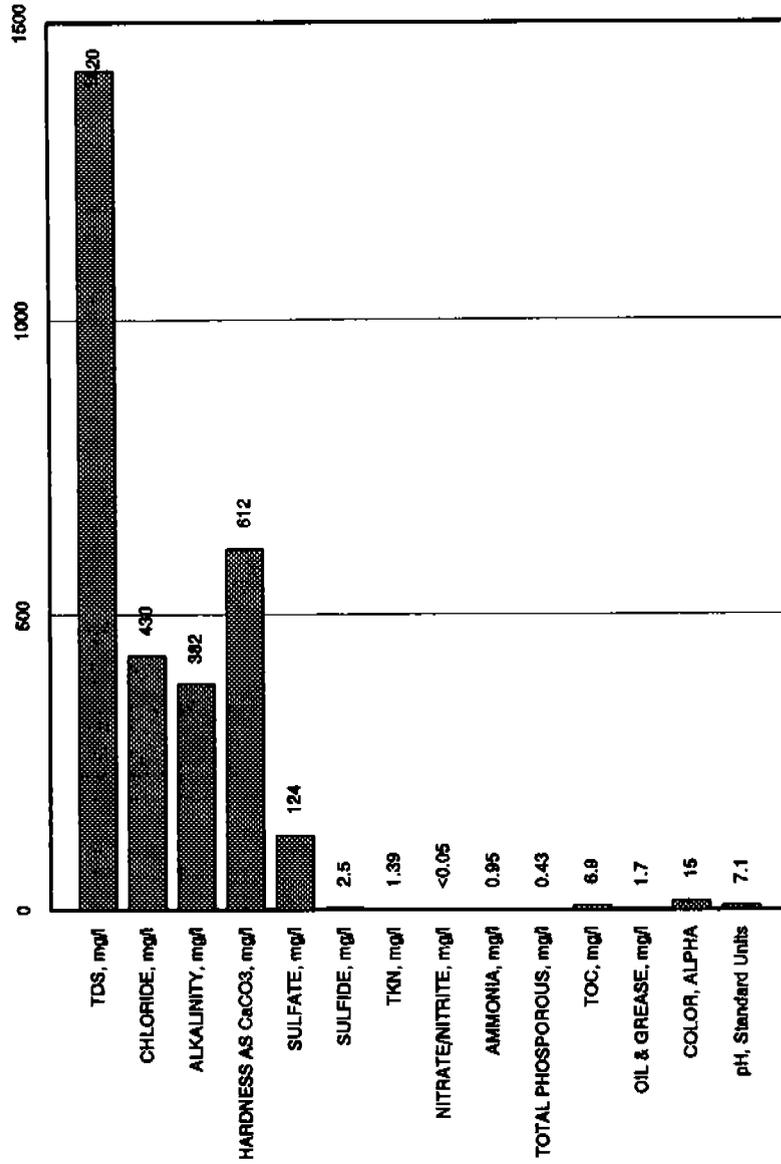


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Groundwater Sample Location MPT-22-MW1-1



**FIGURE D-32
GENERAL WATER QUALITY DATA FROM
MONITORING WELL MPT-22-MW1**

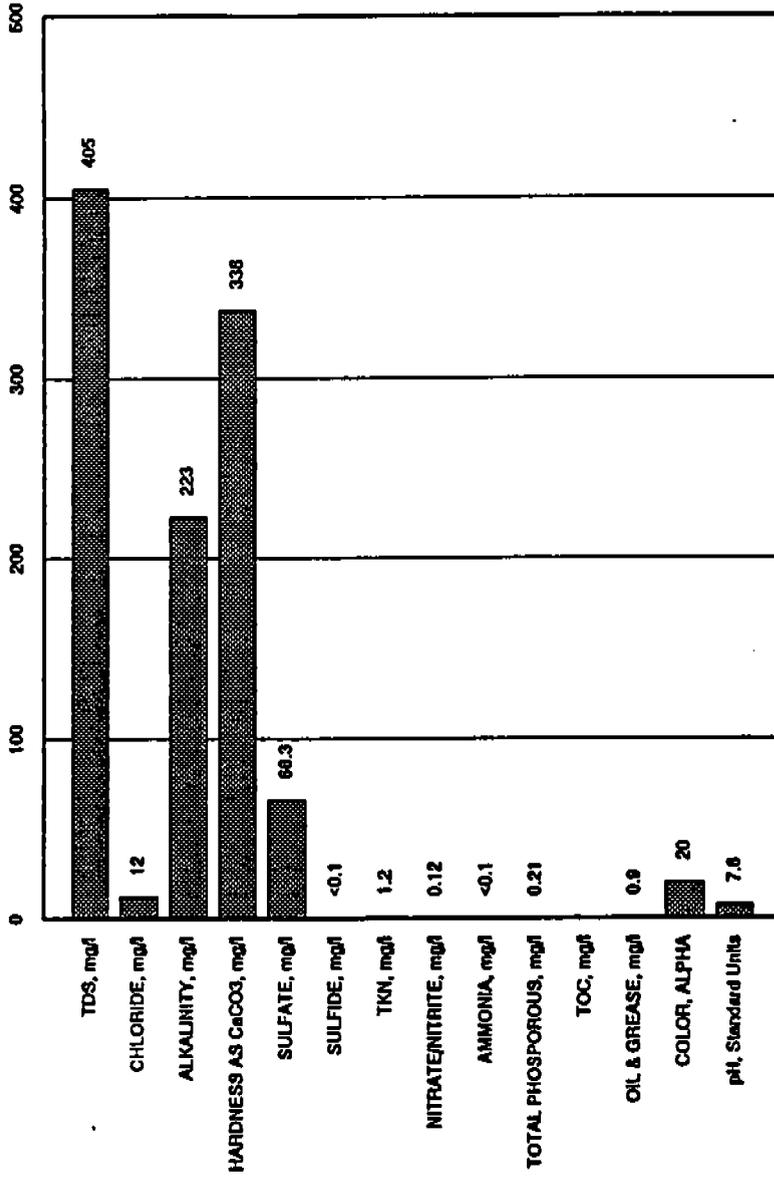


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Groundwater Sample Location S-1



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FIGURE D-33
GENERAL WATER QUALITY DATA FROM
BACKGROUND MONITORING WELL S-1

APPENDIX E

DATA VALIDATION SUMMARY NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; SW-846, Method 8240, the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20722

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

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DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and RRFs, with the exception of 1,4-dioxane. Since samples were not analyzed after the initial calibration, no qualifications are required..

Continuing Calibrations

The continuing calibrations that were analyzed with this data package required qualifications for non compliant %Ds. All compound RRFs were acceptable for all continuing calibrations.

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DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Continuing Calibrations (continued)

Specific findings:

- For the samples listed below, the continuing calibration, CSV0020108, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW	chloromethane
MPT-ER-2	chloroethane
TRIP	trichlorofluoromethane

- For the samples listed below, the continuing calibration, CSV0020149, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW_2	1,1,2,2-tetrachloroethane
VBLKS	trichlorofluoromethane
MPT-2-SW-5	
MPT-2-SD-5	
MPT-2-SW-4	
MPT-2-SD-4	
MPT-2-SW-6	
MPT-2-SD-6	

- For all of the samples, the continuing calibrations exhibited a RRF for 1,4-dioxane less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone and 2-butanone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

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DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Method Blanks (continued)

Specific Findings:

5. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - CRQL

MPT-ER-2
TRIP

methylene chloride - U

MPT-2-SD-4
MPT-2-SD-5
MPT-2-SD-6

acetone - CRQL

MPT-ER-2
TRIP
MPT-2-SW-4
MPT-2-SW-5
MPT-2-SW-6

acetone - U

MPT-2-SD-4
MPT-2-SD-6

2-butanone - CRQL

MPT-ER-2
TRIP
MPT-2-SW-4
MPT-2-SW-5
MPT-2-SW-6

2-butanone - U

MPT-2-SD-4
MPT-2-SD-5

acetone - NA

MPT-2-SD-5

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

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DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Rinseate/Field Blanks

The rinseate blank that was analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD was analyzed with these samples.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs was analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

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ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW MPT-ER-2 TRIP	chloromethane chloroethane trichlorofluoromethane	+	J	2
VBLKW_2 VBLKS MPT-2-SW-5 MPT-2-SD-5 MPT-2-SW-4 MPT-2-SD-4 MPT-2-SW-6 MPT-2-SD-6	1,1,2,2-tetra- chloroethane trichlorofluoromethane	+	J	3
All samples	1,4-dioxane	+/-	J/R	4
MPT-ER-2 TRIP	methylene- chloride	+	CRQL	5
MPT-2-SD-4 MPT-2-SD-5 MPT-2-SD-6	methylene- chloride	+	U	5
MPT-ER-2 TRIP MPT-2-SW-4 MPT-2-SW-5 MPT-2-SW-6	acetone	+	CRQL	5

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

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SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT-2-SD-4 MPT-2-SD-6	acetone	+	U	5
MPT-2-SD-5	acetone	+	NA	3
MPT-ER-2 TRIP MPT-2-SW-4 MPT-2-SW-5 MPT-2-SW-6	2-butanone	+	CRQL	5
MPT-2-SD-4 MPT-2-SD-5 MPT-2-SD-6	2-butanone	+	U	5

- * DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

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DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20722

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

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DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction and analysis holding times were met for all samples.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were acceptable for all compound %RSDs, with the exception of 2-picoline. The average RRFs for all of the compounds met the initial calibration criteria. No qualifications are required since samples were not analyzed after the initial calibrations.

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DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations

The continuing calibrations that were analyzed with this data package require qualifications for non compliant %Ds for and non criteria calibration compounds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

3. For the samples listed below, the continuing calibration, ASBA012623, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKS	benzo(k)fluoranthene
MPT-2-SD-5	
MPT-2-SD-4	
MPT-2-SD-6	

4. For the samples listed below, the continuing calibration, DSBA009684, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW	bis(2-chloroethoxy)methane
MPT-2-SW-5	indeno(1,2,3-cd)pyrene
MPT-2-SW-4	dibenzo(a,h)anthracene
MPT-ER-2	benzidine

5. For the samples listed below, the continuing calibration, DSBA009684, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detects as estimated (UJ).

SBLKW	4-nitroaniline
MPT-2-SW-5	
MPT-2-SW-4	
MPT-ER-2	

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 4

Continuing Calibrations (continued)

6. For the samples listed below, the continuing calibration, DSBA009684, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_2	indeno(1,2,3-cd)pyrene
MPT-2-SW-6	dibenzo(a,h)anthracene
	benzo(g,h,i)perylene
	2-nitroaniline
	4-nitrophenol
	4-nitroaniline
	4,6-dinitro-2-methylphenol
	N-nitrosodimethylamine

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed did not exhibit contamination. No qualifications are required.

Surrogates

Two (2) samples exhibited one surrogate recovery not within QA/QC criteria. Qualifications are not required.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD analyzed with these samples.

Blank Spike/Blank Spike Duplicate

No BS/BSDs associated with this SDG.

Compound Identification/Quantitation

No specific findings.

000004

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name _____

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000006

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000007

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
SBLKS MPT-2-SD-5 MPT-2-SD-4 MPT-2-SD-6	benzo(k)- fluoranthene	+	J	3
SBLKW MPT-2-SW-5 MPT-2-SW-4 MPT-ER-2	bis(2-chloro- ethoxy)methane dibenzo(a,h)- anthracene indeno(1,2,3-cd)pyrene benzidine	+	J	4
SBLKW MPT-2-SW-5 MPT-2-SW-4 MPT-ER-2	4-nitroaniline	+/-	J/UJ	5
SBLKW_2 MPT-2-SW-6	indeno(1,2,3-cd) pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene 2-nitroaniline 4-nitrophenol 4-nitroaniline 4,6-dinitro-2-methylphenol N-nitrosodimethylamine	+	J	6

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000008

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20722

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

Two Appendix IX compounds from this fraction, Endrin Aldehyde and Kepone, were "Not Reported - due to poor recovery from spiking studies performed at the laboratory". Compliant initial and continuing calibrations were presented for Endrin Aldehyde and the reviewer believes the "NR" may be a laboratory reporting error.

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides presented were acceptably linear. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations associated with reported samples were within QC limits. The last two continuing calibrations for both columns each contained several compounds which greatly exceeded the QC limits. However, based upon the file ids it appears that all of the reported samples were analyzed prior to these continuing calibrations.

Blanks

None of the reported Form Is for Method blanks for any fraction showed confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to have been established using appropriate Control Charting procedures by the laboratory.

Matrix Spike/Matrix Spike Duplicate

All reported Recoveries and RPDs for the MS/MSD included in this data package were within QC limits. The Recoveries for the Blank Spikes included for water matrix were somewhat low. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

000002

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000003

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

- * DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator
- + in the DL column denotes a positive result
- + in the QL column denotes a reviewer revised result

000004

DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20722 and 723**, the analysis of ten (10) field water sample and one Matrix Spike and Duplicate pair and seven (7) field soil samples and one Matrix Spike and Duplicate pair for TAL Metals and ten (10) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. The reviewer combined both SDGs together because the Matrix Spike and Dupliacte are for both groups. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Beryllium	0.351	mg/kg	Nickel	14.3	ug/l
Chromium	0.489	mg/kg	Zinc	14.4	ug/l
Cobalt	3.312	mg/kg			

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

000001

Metals Data Assessment Narrative (continued - Page 2)

2. The preparation blank exhibited negative bias for the following element.

Lead -1.0 ug/l

All sample values within ten times the preparation blank contamination and non-detect results are qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recoveries for soils for Antimony and Thallium were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".
4. The Matrix Spike recoveries for waters for Selenium and Thallium were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

5. The following analytes exhibited poor recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

Analyte	Samples
Arsenic	MPTBSWDUP1
Lead	MPTBSWDUP1
Selenium	MPTBSDDUP1 AND MPTBSWDUP1
Thallium	MPTBSDDUP1 AND MPTBSWDUP1

Metals Data Assessment Narrative (continued - Page 3)

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.

000003

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All soil samples All water samples	Be, Cr, Co. Ni and Zn.	+	U	1
All water samples	Pb	+ /U	J/UJ	2
All soil samples	Sb and TI	+ /U	J/UJ	3
All water samples	Se and TI	+ /U	J/UJ	4
MPTBSWDUP1 MPTBSWDUP1 MPTBSDDUP1 AND MPTBSWDUP1 MPTBSDDUP1 AND MPTBSWDUP1	As Pb Se TI	+ /U	J/UJ	5

All water samples The Wet Chemistry will stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
 + denotes positive values
 U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; SW-846, Method 8240; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20723

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all criteria and non criteria compound %RSDs. One compound, 1,4-dioxane, exhibited a RRF less than 0.05. However, qualifications are not required since samples were not analyzed after the initial calibration.

Continuing Calibrations

Two (2) of the continuing calibrations that were analyzed with this data package required qualifications for non compliant %Ds and RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Continuing Calibrations (continued)

Specific findings:

2. For the samples listed below, the continuing calibration, CSV0020108, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW	chloromethane
MPT-ER-1	chloroethane
TRIP BLANK	trichlorofluoromethane
MPT-FB-1	
MPTBSWDUP1	
MPT-MS-1MS	
MPT-MS-1MSD	
MPT-B-SW-1	
MPT-B-SW-2	
MPT-B-SW-3	

3. For the samples listed below, the continuing calibration, CSV0020149, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKS_2	1,1,2,2-tetrachloroethane
MPTBSDDUP1	trichlorofluoromethane
MPT-MS-1MS	
MPT-MS-1MSD	

4. For all of the samples, the continuing calibrations contained 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone and 2-butanone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

5. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - CRQL

MPTBSWDPU1
TRIP BLANK
MPT-B-SW-2

acetone - CRQL

MPT-B-SW-1
TRIP BLANK
MPT-FB-1
MPT-ER-1
MPTBSWDUP1
MPT-B-SW-3
MPT-B-SW-2
MPT-B-SD-1

methylene chloride - U

MPT-B-SW-1
MPT-FB-1
MPT-ER-1
MPT-B-SW-3
MPT-B-SD-1
MPT-B-SD-2
MPT-B-SD-3
MPTBSDDUP1

acetone - U

MPT-B-SD-2
MPTBSDDUP1

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Method Blanks (Specific finding #5 continued)

2-butanone - CRQL

MPT-ER-1
TRIP BLANK
MPT-B-SW-1
MPT-B-SW-2
MPT-B-SW-3

2-butanone - U

MPTBSWDUP1
MPTBSDDUP1
MPT-B-SD-1
MPT-B-SD-2
MPT-B-SD-3

acetone - NA

MPT-B-SD-3

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Rinseate/Field Blanks

The rinseate and field blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Surrogates

All of the surrogates for the sample analyses were not within QA/QC limits. Qualifications are required

6. For the samples listed below, one (1) surrogate exhibited recoveries above the QA/QC limits. Qualify all positive results as estimated (J).

MPT-MS-1MSD

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The two (2) MS/MSDs which were analyzed with this SDG exhibited recoveries and RPDs that were within QA/QC advisory limits. No qualification are required.

000005

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000006

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW MPT-ER-1 TRIP BLANK MPT-FB-1 MPTBSWDUP1 MPT-MS-1MS MPT-MS-1MSD MPT-B-SW-1 MPT-B-SW-2 MPT-B-SW-3	chloromethane chloroethane trichlorofluoromethane	+	J	2
VBLKS_2 MPTBSDDUP1 MPT-MS-1MS MPT-MS-1MSD	1,1,2,2-tetra- chloroethene trichlorofluoromethane	+	J	3
All samples	1,4-dioxane	+/-	J/R	4
MPTBSWDPU1 TRIP BLANK MPT-B-SW-2	methylene- chloride	+	CRQL	5
MPT-B-SW-1 MPT-FB-1 MPT-ER-1 MPTBSDDUP1 MPT-B-SD-1 MPT-B-SD-2 MPT-B-SD-3 MPT-B-SW-3	methylene- chloride	+	U	5

* DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

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SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT-B-SW-1 TRIP BLANK MPT-FB-1 MPT-ER-1 MPTBSWDUP1 MPT-B-SW-3 MPT-B-SW-2 MPT-B-SD-1	acetone	+	CRQL	5
MPT-B-SD-2 MPTBSDDUP1	acetone	+	U	5
MPT-B-SD-3	acetone	+	NA	5
MPT-ER-1 TRIP BLANK MPT-B-SW-1 MPT-B-SW-2 MPT-B-SW-3	2-butanone	+	CRQL	5
MPTBSWDUP1 MPTBSDDUP1 MPT-B-SD-1 MPT-B-SD-2 MPT-B-SD-3	2-butanone	+	U	5
<hr/>				
MPT-MS-1MSD	All Analytes	+	J	6
<hr/>				

- * DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

000010

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20723

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction and analysis holding times were met for all samples.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The two (2) initial calibrations that were analyzed by the laboratory for these samples were acceptable for all compound %RSDs, with the exception of 2-picoline in the 01/23/92 initial calibration. The average RRFs for all of the criteria compounds met the initial calibration criteria. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations

The continuing calibrations that were analyzed with this data package require qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

3. For the samples listed below, the continuing calibration, ASBA012623, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKS	benzo(k)fluoranthene
MPT-B-SD-1	
MPT-B-SD-2	
MPT-B-SD-3	
MPT-BSDDUP1	
MPT-MS-1MS	
MPT-MS-1MSD	

4. For the samples listed below, the continuing calibration, DSBA009684, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_5	bis(2-chloroethoxy)methane
MPT-MS-1MS	indeno(1,2,3-cd)pyrene
MPT-MS-1MSD	dibenzo(a,h)anthracene
MPT-ER-1	benzidine
SBLKW	
MPT-FB-1	
MPT-B-SW-1	

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 4

Continuing Calibrations (continued)

Specific Findings:

5. For the samples listed below, the continuing calibration, DSBA009684, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detects as estimated (UJ).

SBLKW_5	4-nitroaniline
MPT-MS-1MS	
MPT-MS-1MSD	
MPT-ER-1	
SBLKW	
MPT-FB-1	
MPT-B-SW-1	

6. For the samples listed below, the continuing calibration, DSBA009702, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_2	indeno(1,2,3-cd)pyrene
MPT-B-SW-2	dibenzo(a,h)anthracene
	benzo(g,h,i)perylene
	2-nitroaniline
	4-nitrophenol
	4-nitroaniline
	4,6-dinitro-2-methylphenol
	N-nitrosodimethylamine

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

Specific Findings:

7. For the samples listed below, the continuing calibration, DSBA009718, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_3	indeno(1,2,3-cd)pyrene
MPT-B-SW-3	dibenzo(a,h)anthracene
	benzo(g,h,i)perylene
	2-nitroaniline
	4-nitrophenol
	hexachlorobenzene
	diethylphthalate
	N-nitrosodimethylamine
	methyl methanesulfonate
	N-nitrosopiperidine
	benzidine

8. For the samples listed below, the continuing calibration, DSBA009666, contained the following compounds with %Ds greater than 25%. Qualify all positive results for these compounds as estimated (J).

VBLKW_4	nitrobenzene
MPTBSWDUP1	isophorone
	nitrobenzene-d ₅
	2-nitroaniline
	dimethylphthalate
	4-nitrophenol
	N-nitrosodimethylamine
	N-nitrosopiperidine
	4-aminobiphenyl

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

000005

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Method Blanks

The method blanks that were analyzed did not exhibit contamination for TCLs or TICs. No qualifications are required.

Surrogates

Five (5) samples exhibited one surrogate recovery not within QA/QC criteria. Per the Functional Guidelines, qualifications are not required.

Matrix Spike/Matrix Spike Duplicate

One (1) of the two (2) MS/MSDs analyzed with these samples had one spike recovery below the advisory limit. No qualifications are required.

Blank Spike/Blank Spike Duplicate

No BS/BSDs associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000006

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenylenamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000007

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000008

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000009

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
SBLKS MPT-B-SD-1 MPT-B-SD-2 MPT-B-SD-3 MPT-BSDDUP1 MPT-MS-1MS MPT-MS-1MSD	benzo(k)- fluoranthene	+	J	3
SBLKW_5 MPT-B-SW-1 MPT-MS-1MS MPT-MS-1MSD MPT-ER-1 SBLKW MPT-FB-1	bis(2-chloro- ethoxy)ethane indeno(1,2,3-cd)pyrene dibenzo(a,h)anthracene benzidine	+	J	4
SBLKW_5 MPT-MS-1MS MPT-MS-1MSD MPT-ER-1 SBLKW MPT-FB-1 MPT-B-SW-1	4-nitroaniline	+/-	J/UJ	5

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000010

SUMMARY OF DATA QUALIFICATIONS

PAGE-2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
SBLKW_2 MPT-B-SW-2	indeno(1,2,3-cd)- pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene 2-nitroaniline 4-nitrophenol 4-nitroaniline 4,6-dinitro-2-methylphenol N-nitrosodimethylamine	+	J	6
SBLKW_3 MPT-B-SW-3	indeno(1,2,3-cd)- pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene 2-nitroaniline 4-nitrophenol hexachlorobenzene diethylphthalate N-nitrosodimethylamine methyl methanesulfonate N-nitrosopiperidine benzidine	+	J	7
VBLKW_4 MPTBSWDUP1	nitrobenzene isophorone nitrobenzene-d ₅ 2-nitroaniline dimethylphthalate 4-nitrophenol N-nitrosodimethylamine N-nitrosopiperidine 4-aminobiphenyl	+	J	8

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000011

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20723

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

Two Appendix IX compounds from this fraction, Endrin Aldehyde and Kepone, were "Not Reported" - due to poor recovery from spiking studies performed at the laboratory". Compliant initial and continuing calibrations were presented for Endrin Aldehyde and the reviewer believes the "NR" may be a laboratory reporting error.

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides presented were acceptably linear. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations associated with reported samples were within QC limits. The last two continuing calibrations for both columns each contained compounds which greatly exceeded the QC limits. Based upon the file IDs it appears that one sample, MPT-B-SD-3, is associated with these continuing calibrations. However, no positive results were reported for this sample and no qualifications were required.

Blanks

None of the reported Form Is for Method blanks for any fraction showed confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to have been established using appropriate Control Charting procedures by the laboratory.

Matrix Spike/Matrix Spike Duplicate

All reported Recoveries and RPDs for the two MS/MSDs included in this data package were within QC limits. The Recoveries for the Blank Spikes included for water matrix were somewhat low. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

000002

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000003

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result
+ in the QL column denotes a reviewer revised result

000004

DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

X

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from Mayport, SDG# 20722 and 723, the analysis of ten (10) field water sample and one Matrix Spike and Duplicate pair and seven (7) field soil samples and one Matrix Spike and Duplicate pair for TAL Metals and ten (10) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. The reviewer combined both SDGs together because the Matrix Spike and Dupliacte are for both groups. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Beryllium	0.351	mg/kg	Nickel	14.3	ug/l
Chromium	0.489	mg/kg	Zinc	14.4	ug/l
Cobalt	3.312	mg/kg			

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

000001

Metals Data Assessment Narrative (continued - Page 2)

- 2. The preparation blank exhibited negative bias for the following element.

Lead -1.0 ug/l

All sample values within ten times the preparation blank contamination and non-detect results are qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recoveries for soils for Antimony and Thallium were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".
4. The Matrix Spike recoveries for waters for Selenium and Thallium were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

5. The following analytes exhibited poor recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

<u>Analyte</u>	<u>Samples</u>
Arsenic	MPTBSWDUP1
Lead	MPTBSWDUP1
Selenium	MPTBSDDUP1 AND MPTBSWDUP1
Thallium	MPTBSDDUP1 AND MPTBSWDUP1

Metals Data Assessment Narrative (continued - Page 3)

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All soil samples All water samples	Be, Cr, Co. Ni and Zn.	+	U	1
All water samples	Pb	+/U	J/UJ	2
All soil samples	Sb and Tl	+/U	J/UJ	3
All water samples	Se and Tl	+/U	J/UJ	4
MPTBSWDUP1 MPTBSWDUP1 MPTBSDDUP1 AND MPTBSWDUP1 MPTBSDDUP1 AND MPTBSWDUP1	As Pb Se Tl	+/U	J/UJ	5

All water samples The Wet Chemistry will stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
 + denotes positive values
 U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20740

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were not analyzed within the contractual holding times for volatile analysis. Three (3) samples exceeded the analysis holding time by one (1) day. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs. All of the RRFs, with the exception of 1,4-dioxane, were greater than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Continuing Calibrations

The three (3) continuing calibrations that were analyzed with this data package required qualifications for non compliant %Ds.

Specific findings:

2. For the samples listed below, the continuing calibration, CSVO020192, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKS_3	1,2-dichloroethane-d ₄
MPT-13-SD2	trichlorofluoromethane
MPT-2-SD-7	
MPT-2-SD-7	

3. For the samples listed below, the continuing calibration, CSVO020149, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW	1,1,2,2-tetrachloroethane
VBLKS	trichlorofluoromethane
MPT-2-SW-9	
MPT-2-SD-9	
MPT-13-SD1	

4. For the samples listed below, the continuing calibration, CSVO020168, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

VBLKW_2	trichloro-
VBLKS_2	fluoromethane
MPT-ER-3	
TRIP_3	
MPT-2-SW	
MPT-2SW-7A	
MPT-13-SD3	

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Continuing Calibrations (continued)

5. For all of the samples, all of the continuing calibration contained 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone and 2-butanone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

6. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - U

MPT-2-SD-9
MPT-13-SD1
MPT-2-SW-7
MPT-2-SW-7A
MPT-ER-3
TRIP_3
MPT-13-SD3
MPT-13-SD2
MPT-2-SD-7
MPT-2-SD-7A

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Method Blanks (Specific finding #6 continued)

acetone - CRQL

MPT-2-SW-9
MPT-2-SD-9
MPT-13-SD1
MPT-ER-3
MPT-2-SW-7
MPT-2-SW-7A
TRIP_3
MPT-13-SD3
MPT-13-SD2
MPT-2-SD-7

acetone - U

MPT-2-SD-7A

2-butanone - CRQL

MPT-2-SD-9
MPT-13-SD1
MPT-13-SD2
MPT-2-SD-7
MPT-2-SW-7
MPT-ER-3
TRIP_3

2-butanone - U

MPT-2-SW-9

MPT-2-SW-7A
MPT-13-SD3

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Rinseate/Field Blanks

The rinseate blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required

000005

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 6

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD was analyzed with samples.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSD was analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000006

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

000007

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKS_3 MPT-13-SD2 MPT-2-SD-7 MPT-2-SD-7	1,2-dichloro- ethane-d ₄ trichlorofluoromethane	+	J	2
VBLKW VBLKS MPT-2-SW-9 MPT-2-SD-9 MPT-13-SD1	1,1,2,2-tetra- chloroethane trichlorofluoromethane	+	J	3
VBLKW_2 VBLKS_2 MPT-ER-3 TRIP_3 MPT-2-SW MPT-2SW-7A MPT-13-SD3	trichloro- fluoromethane	+	J	4
All samples	1,4-dioxane	+/-	J/R	5
MPT-2-SD-9 MPT-13-SD1 MPT-2-SW-7 MPT-2-SW-7A MPT-ER-3 TRIP_3 MPT-13-SD3 MPT-13-SD2 MPT-2-SD-7 MPT-2-SD-7A	methylene- chloride	+	U	6

* DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT-2-SW-9 MPT-2-SD-9 MPT-13-SD1 MPT-ER-3 MPT-2-SW-7 MPT-2-SW-7A TRIP_3 MPT-13-SD3 MPT-13-SD2 MPT-2-SD-7	acetone	+		CRQL 6
MPT-2-SD-7A	acetone	+	U	6
MPT-13-SD1 MPT-13-SD2 MPT-2-SD-7 MPT-2-SW-7 MPT-ER-3 TRIP_3	2-butanone	+		CRQL 6
MPT-2-SW-9 MPT-2-SD-9 MPT-2-SW-7A MPT-13-SD3	2-butanone	+	U	6

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000010

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; SW-846, Method 8270, the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20740

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see **Attachment B**) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in **Attachment A**. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in **Attachment B**. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction and analysis holding times were met for all samples.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were acceptable for all compound %RSDs. The average RRFs for all of the criteria compounds met the initial calibration criteria.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations

The continuing calibrations that were analyzed with this data package require qualifications for non compliant %Ds for and non criteria calibration compounds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

3. For the samples listed below, the continuing calibration, DSBA009702, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKS	indeno(1,2,3-cd)pyrene
MPT-2-SD-9	dibenzo(a,h)anthracene
MPT-13-SD1	benzo(g,h,i)perylene
MPT-2-SD-7A	2-nitroaniline
	4-nitrophenol
	4-nitroaniline
	4,6-dinitro-2-methylphenol
	N-nitrosodimethylamine

4. For the samples listed below, the continuing calibration, DSBA009718, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKS_2	indeno(1,2,3-cd)pyrene
MPT-B-SD-2	dibenzo(a,h)anthracene
MPT-B-SD-3	benzo(g,h,i)perylene
MPT-2-SD-7	2-nitroaniline
MPT-2-SW-9	4-nitrophenol
MPT-2-SW-7	hexachlorobenzene
MPT-2-SW-7A	diethylphthalate
SBLKW	N-nitrosodimethylamine
	methyl methanesulfonate
	N-nitrosopiperidine
	benzidine

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

5. For the samples listed below, the continuing calibration, DSBA009733, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

VBLKW_2	indeno(1,2,3-cd)pyrene
MPT-ER-3	dibenzo(a,h)anthracene
MPT-2-SW9MS	2-nitroaniline
MPT-2-SW9MSD	4-nitroaniline
	4-nitrophenol
	N-nitrosodimethylamine
	methyl methanesulfonate
	benzidine
	pentachlorobenzene

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for di-n-butylphthalate. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

6. The following samples have been qualified for blank contamination. Qualification are for all method blanks.

di-n-butylphthalate -CRQL

di-n-butylphthalate - U

MPT-13-SD1
MPT-2-SD-7A
MPT-13-SD2
MPT-13-SD3
MPT-2-SW-9
MPT-2-SW-7
MPT-ER-3

MPT-2-SD-9
MPT-2-SD-7

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Surrogates

Two (2) samples exhibited one surrogate recovery not within QA/QC criteria. Qualifications are not required.

Matrix Spike/Matrix Spike Duplicate

The MS/MSD analyzed with these samples had one RPD above the advisory limit. No qualifications are required.

Blank Spike/Blank Spike Duplicate

No BS/BSDs associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenylenamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000006

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000007

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form 1s in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000008

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
SBLKS MPT-2-SD-9 MPT-13-SD1 MPT-2-SD-7A	indeno(1,2,3-cd) pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene 2-nitroaniline 4-nitrophenol 4-nitroaniline 4,6-dinitro-2-methylphenol N-nitrosodimethylamine	+	J	3
SBLKS_2 MPT-B-SD-2 SBLKW MPT-B-SD-3 MPT-2-SD-7 MPT-2-SW-9 MPT-2-SW-7 MPT-2-SW-7A	indeno(1,2,3-cd) pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene 2-nitroaniline 4-nitrophenol hexachlorobenzene diethylphthalate N-nitrosodimethylamine methyl methanesulfonate N-nitrosopiperidine benzidine	+	J	4

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

SUMMARY OF DATA QUALIFICATIONS

PAGE-2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
VBLKW_2 MPT-ER-3 MPT-2-SW9MS MPT-2-SW9MSD	indeno(1,2,3-cd)- pyrene dibenzo(a,h)anthracene 2-nitroaniline 4-nitroaniline 4-nitrophenol N-nitrosodimethylamine methyl methanesulfonate benzidine pentachlorobenzene	+	J	5
MPT-13-SD1 MPT-13-SD3 MPT-13-SD2 MPT-2-SW-9 MPT-2-SW-7 MPT-ER-3	di-n-butyl- phthalate	+	CRQL	6
MPT-2-SD-9 MPT-2-SD-7 MPT-2-SD-7A	di-n-butyl- phthalate	+	U	6

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000010

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form 1s). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20740

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported - due to poor recovery from spiking studies performed at the laboratory".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides presented were acceptably linear. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations associated with reported samples were within QC limits. The last continuing calibration for both columns contained compounds which greatly exceeded the QC limits. However, based upon the file IDs it appears that all of the reported samples were analyzed prior to these continuing calibrations.

Blanks

None of the reported Form Is for Method blanks for any fraction showed confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to have been established using appropriate Control Charting procedures by the laboratory.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was included in this data package. The Recoveries for the Blank Spikes included for the water matrix were somewhat low. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

000002

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000003

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result
+ in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from Mayport, SDG# 20740, the analysis of four (4) field water samples and no Matrix Spike and Duplicate pair and six (6) field soil samples and no Matrix Spike and Duplicate pair for TAL Metals and four field water samples for Wet Chemistry. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The Laboratory performed a Matrix Spike and Duplicate on samples from a different site and are not acceptable. The All other protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Cadmium	0.366	mg/kg	Cadmium	3.3	ug/l
Lead	0.55	mg/kg			

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

2. The preparation blank exhibited negative bias for the following element.

Beryllium	-0.033	mg/kg	Beryllium	-1.1	ug/l
			Vanadium	-3.0	ug/l



Metals Data Assessment Narrative (continued - Page 2)

All sample values within ten times the preparation blank contamination and non-detect results are qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. No Matrix Spike for this SDG. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

4. The Duplicate Analysis for this SDG. All positive and non-detect results are qualified as estimated, "J" or "UJ".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.



Metals Data Assessment Narrative (continued - Page 2)

All sample values within ten times the preparation blank contamination and non-detect results are qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. No Matrix Spike for this SDG. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

4. The Duplicate Analysis for this SDG. All positive and non-detect results are qualified as estimated, "J" or "UJ".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 20753

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000008

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all %RSDs. One compound, 1,4-dioxane, exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

Two (2) of the continuing calibrations that were analyzed with this data package required qualifications for non compliant %Ds. All of the calibrations require qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations (continued)

Specific findings:

2. For the samples listed below, the continuing calibration, CSVO020108, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW	chloromethane
FIELD_BLANK2	chloroethane
TRIP_BLANK_4	trichlorofluoromethane
RIG_WATER	

3. For the samples listed below, the continuing calibration, CSVO020192, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKS_2	1,2-chloroethane-d ₄
MPT-2-12S	trichlorofluoromethane
MPT-2-16S	1,3-dichlorobenzene
MPT-2-17S	1,2-dichlorobenzene
MPT-13-4	
MPT-13-5	
MPT-13-6	
MPT-22-1S	

4. For the samples listed below, the continuing calibration, CSVO020168, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW_2	trichlorofluoromethane
VBLKS	
RINSEATE	
MPT-13-4DP	
MPT-134-DUPMSD	
MPT-134-DUPMS	
MPT-2-115	

5. For all of the samples, the continuing calibrations contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

000093

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone and 2-butanone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

6. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - CRQL

FIELD_BLANK2
TRIP_BLANK_4

methylene chloride - U

RIG_WATER
RINSATE
MPT-13-4DUP
MPT-2-115
MPT-22-1S
MPT-13-6
MPT-13-5
MPT-13-4
MPT-2-17S
MPT-2-16S
MPT-2-12S

acetone - CRQL

RIG_WATER
TRIP_BLANK_4
FIELD_BLANK2
MPT-2-115
MPT-22-1S
MPT-13-4
MPT-2-17S

acetone - U

RINSATE
MPT-13-4DUP
MPT-13-6
MPT-13-5
MPT-2-16S
MPT-2-12S

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 5

Method Blanks (Specific finding #6 continued)

2-butanone - CRQL

RIG WATER
TRIP BLANK 4
FIELD BLANK2
RINSEATE
MPT-22-1S
MPT-13-6

2-butanone - U

MPT-13-4DUP
MPT-2-115

MPT-13-5
MPT-13-4
MPT-2-17S
MPT-2-16S
MPT-2-12S

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Rinseate/Field Blanks

The rinseate and field blank that was analyzed exhibited contamination that was attributed to the method blank. Two (2) compounds also yielded positive results below the CRQL. No qualifications will be required for these compounds.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The one (1) MS/MSD exhibited acceptable recoveries and RPDs. No qualifications are required.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

000005

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 6

Compound Identification/Quantitation

No qualifications are required.

000006

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

000007

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000008

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW FIELD_BLANK2 TRIP_BLANK_4 RIG_WATER	chloromethane chloroethane trichlorofluoromethane	+	J	2
VBLKS_2 MPT-2-12S MPT-2-16S MPT-2-17S MPT-13-4 MPT-13-5 MPT-13-6 MPT-22-1S	1,2-chloro- ethane-d ₄ trichlorofluoromethane 1,3-dichlorobenzene 1,2-dichlorobenzene	+	J	3
VBLKW_2 VBLKS RINSEATE MPT-13-4DP MPT-134-DUPMSD MPT-134-DUPMS MPT-2-115	trichloro- fluoromethane	+	J	4
All samples	1,4-dioxane	+/-	J/R	5

* DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

SUMMARY OF DATA QUALIFICATIONS

PAGE-2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
RIG_WATER RINSATE MPT-13-4DUP MPT-2-115 MPT-22-1S MPT-13-6 MPT-13-5 MPT-13-4 MPT-2-17S MPT-2-16S MPT-2-12S	methylen- chloride	+	U	6
FIELD_BLANK2 TRIP_BLANK_4	methylen- chloride	+	CRQL	6
RIG_WATER TRIP_BLANK_4 FIELD_BLANK2 MPT-2-115 MPT-13-4 MPT-2-17S	acetone	+	CRQL	6
RINSATE MPT-13-4DUP MPT-13-6 MPT-13-5 MPT-22-1S MPT-2-16S MPT-2-12S	acetone	+	U	6
RIG_WATER TRIP_BLANK_4 FIELD_BLANK2 RINSATE MPT-22-1S	2-butanone	+	CRQL	6

* DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

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SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT-13-4DUP MPT-2-115 MPT-13-6 MPT-13-5 MPT-13-4 MPT-2-17S MPT-2-16S MPT-2-12S	2-butanone	+	U	6

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000011



DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20753

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (**See Attachment A**) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction and analysis holding times were met for all samples.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were acceptable for all compound %RSDs, with the exception of 2-picoline in the initial calibration analyzed on 01/23/92. The average RRFs for all of the criteria compounds met the initial calibration criteria. No qualifications are required.

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DATA ASSESSMENT NARRATIVE

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Continuing Calibrations

The continuing calibrations that were analyzed with this data package require qualifications for non compliant %Ds for and non criteria calibration compounds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

3. For the samples listed below, the continuing calibration, DSBA009733, contained the following compounds with %Ds greater than 25%. Qualify all positive results for these compounds as estimated (J).

SBLKW	indeno(1,2,3-cd)pyrene
FIELD_BLANK2	dibenzo(a,h)anthracene
RINSATE	2-nitroaniline
RIG_WATER	4-nitrophenol
	4-nitroaniline
	N-nitrosodimethylamine
	methyl methanesulfonate
	benzidine
	pentachlorobenzene

4. For the samples listed below, the continuing calibration, DSBA009750, contained the following compounds with %Ds greater than 25%. Qualify all positive results for these compounds as estimated (J).

SBLKS	bis(2-chloroethoxy)methane
MPT-2-115	benzo(k)fluoranthene
MPT-1-12S	dibenzo(a,h)anthracene
MPT-2-16S	2,4-dinitrophenol
MPT-2-17S	4-nitrophenol
MPT-13-4	4-nitroaniline
MPT-13-6	4,6-dinitro-2-methylphenol
MPT-13-4DUP	3,3'-dichlorobenzidine
MPT134DUPMS	
MPT134DUPMSD	
MPT-13-5	

000003

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Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for di-n-butylphthalate. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

5. The following samples have been qualified for blank contamination. Qualification are for all method blanks.

bis(2-ethylhexyl)phthalate - U

RIG_WATER
RINSATE
FIELD_BLANK2
MPT-2-16S
MPT-1-115

bis(2-ethylhexyl)phthalate - CRQL

MPT-13-4DUP
MPT-13-6
MPT-13-5
MPT-13-4
MPT-2-17S
MPT-2-12S

di-n-butylphthalate - U

RIG_WATER
MPT-13-4DUP
MPT-13-6
MPT-13-5
MPT-13-4
MPT-2-17S
MPT-2-16S
MPT-2-12S
MPT-2-115

di-n-butylphthalate - CRQL

RINSATE
FIELD_BLANK2
MPT-22-1S

000004

DATA ASSESSMENT NARRATIVE

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Method Blanks (continued)

pentachlorophenol- U

pentachlorophenol- CRQL

MPT-13-4DUP

MPT-13-5

MPT-13-6

MPT-13-4

MPT-2-17S

MPT-2-16S

MPT-2-12S

MPT-2-115

Surrogates

One (1) sample exhibited one surrogate recovery not within QA/QC criteria. Qualifications are not required.

Matrix Spike/Matrix Spike Duplicate

The MS/MSD analyzed with these samples exhibited acceptable recoveries and RPDs. No qualifications are required.

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000006

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

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SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
SBLKW FIELD_BLANK2 RIG_WATER RINSATE	indeno(1,2,3-cd)- pyrene dibenzo(a,h)anthracene 2-nitroaniline 4-nitrophenol N-nitrosodimethylamine methyl methanesulfonate benzidine pentachlorobenzene 4-nitroaniline	+	J	3
SBLKS MPT-2-115 MPT-13-5 MPT-1-12S MPT-2-16S MPT-2-17S MPT-13-4 MPT-13-6 MPT-13-4DUP MPT134DUPMS MPT134DUPMSD	bis(2-chloro- ethoxy)methane benzo(k)fluoranthene dibenzo(a,h)anthracene 2,4-dinitrophenol 4-nitrophenol 4-nitroaniline 4,6-dinitro-2-methylphenol 3,3'-dichlorobenzidine	+	J	4
RIG_WATER RINSATE FIELD_BLANK2 MPT-2-16S MPT-1-115	bis(2-ethyl- hexyl)phthalate	+	U	5

* DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

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SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT-13-4DUP MPT-13-6 MPT-13-5 MPT-13-4 MPT-2-17S MPT-2-12S	bis(2-ethyl- hexyl)phthalate	+	CRQL	5
RIG_WATER MPT-13-4DUP MPT-13-6 MPT-13-5 MPT-13-4 MPT-2-17S MPT-2-16S MPT-2-12S MPT-2-115	di-n-butyl- phthalate	+	U	5
RINSATE FIELD_BLANK2 MPT-22-1S	di-n-butyl- phthalate	+	CRQL	5
MPT-13-4DUP MPT-13-6 MPT-13-4 MPT-2-17S MPT-2-16S MPT-2-12S MPT-2-115	pentachlorophenol	+	U	5
MPT-13-5	pentachlorophenol	+	CRQL	5

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000010



DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 20877

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

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DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all %RSDs. One compound, 1,4-dioxane, exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

Two (2) of the three (3) continuing calibrations that were analyzed with this data package required qualifications for non compliant %Ds. All of the calibrations require qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Continuing Calibrations (continued)

Specific findings:

- For the samples listed below, the continuing calibration, CSVO020470, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW	carbon
MPT2MW04-01	tetrachloride
MPT2MW5-01	trans-1,3,-dichloropropene
MPT2MW8-01	chloromethane
MPT2MW10-01	trichlorofluoromethane
MPT2MW15S-01	1,2-dichlorobenzene
	dibromomethane

- For the samples listed below, the continuing calibration, CSVO020530, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW_3	acetone
TRIP BLANK	2-butanone
	2-hexanone
	4-methyl-2-pentanone
	ethyl methacrylate
	1,2,3-trichloropropane
	trans-1,4-dichloro-2-butene

- For all of the samples, the continuing calibrations contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride and/or acetone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

5. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - CRQL

MPT2MW15S-01
MPT2MW8-01
MPT2MW5-01
MPT2MW4-01
MPT2MW5-01D

methylene chloride - U

MPT2MW10-01
MPT2MW16S-01
MPT2MW15D-01
TRIP BLANK

acetone - CRQL

MPT2MW15S-01
MPT2MW8-01
MPT2MW16S-01

acetone - U

MPT2MW10-01
MPT2MW5-01
MPT2MW4-01
MPT2MW5-01D
MPT2MW15D-01
TRIP BLANK

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Trip Blanks

The trip blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Rinseate/Field Blanks

A rinseate or field blank was not identifiable in this SDG.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD exhibited acceptable recoveries and RPDs. No qualifications are required.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

000006

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW MPT2MW04-01 MPT2MW5-01 MPT2MW8-01 MPT2MW10-01 MPT2MW15S-01	carbon tetrachloride trans-1,3-dichloropropene chloromethane trichlorofluoromethane 1,2-dichlorobenzene dibromomethane	+	J	2
VBLKW_3 TRIP BLANK	acetone 2-butanone 2-hexanone 4-methyl-2-pentanone ethyl methacrylate 1,2,3-trichloropropane trans-1,4-dichloro-2-butene	+	J	3
All samples	1,4-dioxane	+/-	J/R	4
MPT2MW15S-01 MPT2MW8-01 MPT2MW5-01 MPT2MW4-01 MPT2MW5-01D	methylene chloride	+BJ	CRQL	5
MPT2MW10-01 MPT2MW16S-01 MPT2MW15D-01 TRIP BLANK	methylene chloride	+B	U	5

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

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SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT2MW15S-01 MPT2MW8-01 MPT2MW16S-01	acetone	+BJ	CRQL	5
MPT2MW10-01 MPT2MW5-01 MPT2MW4-01 MPT2MW5-01D MPT2MW15D-01 TRIP BLANK	acetone	+B	U	5

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000009

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20877

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

00001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction holding times and analysis holding times were met for all samples. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Initial Calibrations

One (1) of the initial calibrations that were analyzed by the laboratory for these samples was not acceptable for all compound %RSDs. All RRFs were acceptable.

Specific findings:

3. The initial calibration analyzed on 02/17/92 contained the following compounds with %RSDs greater than 30%. No qualifications are required since samples were not analyzed after the initial calibration.

benzidine
1-naphthylamine
2-naphthylamine
4-aminobiphenyl

Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

4. For the samples listed below, the continuing calibration, DSBA09998, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW	benzoic acid
MPT2MW5-01	4-nitrophenol
	4,6-dinitro-2-methylphenol
	2-naphthylamine
	4-aminobiphenyl

5. For the samples listed below, the continuing calibration, DSBA09998, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW	2,4-dinitro-
MPT2MW5-01	phenol

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

6. For the samples listed below, the continuing calibration, DSBA010016, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_2	4-nitrophenol
MPT2MW4-01	1-naphthylamine
MPT2MW10-01	2-naphthylamine
MPT2MW15D-01	phenacetin
MPT2MW16S-01	
MPT2MW5-01D	
MPT2MW501DMS	
MPT2MW501DMSD	

7. For the samples listed below, the continuing calibration, ASBA013104, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_3	hexachloro-
MPT2MW15S-01	benzene
	benzo(k)anthene
	bis(2-chloroisopropyl)ether
	2,4-dinitrophenol
	4-nitroaniline
	3,3'-dichlorobenzidine
	2-picoline
	methyl methanesulfonate
	N-nitrosopiperidine
	1-naphthylamine

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

8. For the samples listed below, the continuing calibration, ASBA013104, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW_3	benzidine
MPT2MW15S-01	2-naphthylamine
	4-aminobiphenyl

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for TCLs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

9. The following samples have been qualified for method blank contamination.

di-n-butylphthalate - CRQL

MPT2MW5-01
MPT2MW8-01

bis(2-ethylhexyl)phthalate - CRQL

MPT2MW5-01
MPT2MW8-01
MPT2MW10-01

000005

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Surrogates

All of the surrogate recoveries were within QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

The MS/MSD exhibited acceptable recoveries. No qualifications are required.

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000006

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000007

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000008

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000009

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
SBLKW MPT2MW5-01	benzoic acid 4-nitrophenol 4,6-dinitro-2-methylphenol 2-naphthylamine 4-aminobiphenyl	+	J	4
SBLKW MPT2MW5-01	2,4-dinitro-phenol	+/-	J/UJ	5
SBLKW_2 MPT2MW4-01 MPT2MW10-01 MPT2MW15D-01 MPT2MW16S-01 MPT2MW5-01D MPT2MW501DMS MPT2MW501DMSD	4-nitrophenol 1-naphthylamine 2-naphthylamine phenacetin	+	J	6

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000010

SUMMARY OF DATA QUALIFICATIONS

PAGE - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
SBLKW_3 MPT2MW15S-01	hexachloro- benzene benzo(k)anthene bis(2-chloroisopropyl)ether 2,4-dinitrophenol 4-nitroaniline 3,3'-dichlorobenzidine 2-picoline methyl methanesulfonate N-nitrosopiperdine 1-naphthylamine	+	J	7
SBLKW_3 MPT2MW15S-01	benzidine 2-naphthylamine 4-aminobiphenyl	+/-	J/UJ	8
MPT2MW5-01 MPT2MW8-01	di-n-butyl- phthalate	+BJ	CRQL	9
MPT2MW5-01 MPT2MW8-01 MPT2MW10-01	bis(2-ethyl- hexyl)phthalate	+BJ	CRQL	9

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000011

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20877

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported - due to poor recovery from spiking studies performed at the laboratory".

Holding Times

Sample MPT2MW15D-01RX was re-extracted outside the required hold time.

Specific Finding

1. All reported non-detect results for sample MPT2MW15D-01RX are qualified as estimated because it was re-extracted outside the required hold time.

All other samples were extracted and analyzed within the required hold times based on the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides were presented using non-linear quadratic model statistics. All quadratic correlations were acceptable. No qualification of the reported results were required based on the initial calibration.

Continuing Calibrations

All %Ds for all continuing calibrations were within QC limits with only one exception. Delta-BHC was slightly above the 15% D QC limit in one continuing calibration.

Specific Finding

2. All samples appear to be associated with the continuing calibration containing a high % difference due to a decrease in response for Delta-BHC. Therefore, all reported non-detect results for this compound are qualified as estimated.

Blanks

The reported Form Is for the Method blanks showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

Recovery limits for the surrogates appear to be those of the USEPA CLP 2/88 SOW.

Specific Finding

3. Sample MPT2MW15D-01 showed 0% recovery for the DBC surrogate. All non-detect results (all) for this sample are rejected, "R".

Matrix Spike/Matrix Spike Duplicate

All Recoveries and RPDs for the MS/MSD included in this data package were within QC limits. No qualifications were required.

000002

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

000003

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000004

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT2MW15D-01RX	All	U	UJ	1
All	delta-BHC	U	UJ	2
MPT2MW15D-01	All	U	R	3

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result
+ in the QL column denotes a reviewer revised result

000005



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20877**, the analysis of eight (8) field water sample and one Matrix Spike and Duplicate pair for Cyanide only and seven (7) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u> _____	<u>ANALYTE</u> _____	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
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All water data stands as reported without qualification.

All water samples The Wet Chemistry will stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE



VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20884

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all %RSDs. One compound, 1,4-dioxane, exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

One (1) of the three (3) continuing calibrations that were analyzed with this data package required qualifications for non compliant %Ds. All of the calibrations require qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations (continued)

Specific findings:

2. For the samples listed below, the continuing calibration, CSV0020549, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW_2	chloromethane
MPT2MW7D-01	bromomethane
MPT2MW2-01	
MPT2MW2-01D	
MPT2MW2-01DMS	
MPT2MW2-01DMSD	

3. For all of the samples, the continuing calibrations contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride and/or acetone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 4

Method Blank (continued)

Specific Findings:

4. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - CRQL

MPT2MW6-01
MPT2MW7S-01

methylene chloride - U

MPT2MW1-01
TRIP BLANK
MPT-FB-01
MPT-RB-01
MPT13MW1-01
MPT13MW3-01
MPT13MW2-01
MPT13MW6-01

acetone - CRQL

MPT2MW6-01
MPT2MW1-0
MPT2MW7S-01
MPT2MW7D-01
MPT13MW1-01
MPT13MW3-01
MPT13MW2-01

acetone - U

TRIP BLANK
MPT-FB-01
MPT-RB-01
MPT2MW7D-01
MPT2MW2-01D
MPT13MW6-01

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 5

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Rinseate/Field Blanks

The rinseate blank and field blank exhibited contamination that was attributed to method blank contamination. In addition, chlorobenzene was detected in both samples. However, the associated samples did not exhibit contamination for chlorobenzene, so qualifications are not required.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD exhibited acceptable recoveries and RPDs. No qualifications are required.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

000006

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW_2 MPT2MW7D-01 MPT2MW2-01 MPT2MW2-01D MPT2MW2-01DMS MPT2MW2-01DMSD	chloromethane bromomethane	+	J	2
All samples	1,4-dioxane	+/-	J/R	3
MPT2MW6-01 MPT2MW7S-01	methylene chloride	+BJ	CRQL	4
MPT2MW1-01 TRIP BLANK MPT-FB-01 MPT-RB-01 MPT13MW1-01 MPT13MW3-01 MPT13MW2-01 MPT13MW6-01	methylene chloride	+B	U	4
MPT2MW6-01 MPT2MW1-0 MPT2MW7S-01 MPT2MW7D-01 MPT13MW1-01 MPT13MW3-01 MPT13MW2-01	acetone	+BJ	CRQL	4

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000008

SUMMARY OF DATA QUALIFICATIONS

PAGE - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
TRIP BLANK MPT-FB-01 MPT-RB-01 MPT2MW7D-01 MPT2MW2-01D MPT13MW6-01	acetone	+ B	U	4

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000009

~~X~~

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20884

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.

- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction holding times and analysis holding times were met for all samples. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

Initial Calibrations

One (1) of the initial calibrations that were analyzed by the laboratory for these samples was not acceptable for all compound %RSDs. All RRFs were acceptable.

Specific findings:

3. The initial calibration analyzed on 02/17/92 contained the following compounds with %RSDs greater than 30%. No qualifications are required since samples were not analyzed after the initial calibration.

benzidine
1-naphthylamine
2-naphthylamine
4-aminobiphenyl

Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

4. For the samples listed below, the continuing calibration, DSBA010016, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW	phenacetin
MPT2MW6-01	4-nitrophenol
	2-naphthylamine
	1-naphthylamine

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 4

Continuing Calibrations (continued)

5. For the samples listed below, the continuing calibration, ASBA013124, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_2	2-methyl-
All samples except	naphthalene
MPT2MW6-01	bis(2-chloroethoxy)methane
	hexachlorobenzene
	benzo(k)fluoranthene
	4,6-dinitro-2-methylphenol
	3,3'-dichlorobenzidine
	methyl methanesulfonate
	benzidine
	2-naphthylamine
	pentachloronitrobenzene

6. For the samples listed below, the continuing calibration, ASBA013124, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW_2	2,4-dinitro-
All samples except	phenol
MPT2MW6-01	

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for TCLs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 5

Method Blanks (continued)

Specific findings:

7. The following samples have been qualified for method blank contamination.

di-n-butylphthalate - CRQL

All samples except
MPT2MW6-01

Surrogates

All of the surrogate recoveries, with the exception of one (1) recovery, were within QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was submitted with this SDG.

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000006

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000008

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
SBLKW MPT2MW6-01	phenacetin 4-nitrophenol 2-naphthylamine 1-naphthylamine	+	J	4
SBLKW_2 All samples except MPT2MW6-01	2-methyl- naphthalene bis(2-chloroethoxy)methane hexachlorobenzene benzo(k)fluoranthene 4,6-dinitro-2-methylphenol 3,3'-dichlorobenzidine methyl methanesulfonate benzidine 2-naphthylamine pentachloronitrobenzene	+	J	5
SBLKW_2 All samples except MPT2MW6-01	2,4-dinitro- phenol	+/-	J/UJ	6
All samples except MPT2MW6-01	di-n-butyl- phthalate	+BJ	CRQL	7

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form 1s). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20884

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported - due to poor recovery from spiking studies performed at the laboratory".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides were presented using non-linear quadratic model statistics. The correlations were acceptable. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations were within QC limits with only one exception. Delta-BHC was slightly above the 15% D QC limit in one continuing calibration. Although the difference was due to a decrease in response for this compound, neither of the reported samples appear to be associated with this continuing calibration based on the file IDs. No qualifications were required based on the data presented.

Blanks

The reported Form Is for the Method blanks showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to be approximately those utilized by the USEPA CLP under the 2/88 SOW.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was included in this data package. All Recoveries for the Blank Spike included for the water matrix were within QC limits. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000003

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result

+ in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20877 and 884**, the analysis of twenty (20) field water samples and one Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Arsenic	0.4	ug/l
Calcium	65.6	ug/l

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

Interferences

No significant interferences were observed.

000091



Metals Data Assessment Narrative (continued - Page 2)

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

2. The Serial Dilution for Barium was outside the control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

MSA

3. The following samples exhibited poor recoveries during the Analytical spiking for GFAA. All positive and non-detect results are qualified as estimated, "J" or "UJ".

<u>Analyte</u>	<u>Sample Numbers</u>
Arsenic	mw-4-01, mw-5-01, mw-5-01d and mw-8-01.
Lead	MPT2MW-1-01, MW-15D-01, MW-15S-01 MW-4-01 AND -5-01.
Selenium	MPT13MW-1-01, -2-01, -3-01, -6-01 AND MPT2MW-6-01.
Thallium	MPT2MW-1-01, -7S-01, MW-10-01, MW-16D-01 AND MW-8-01.



SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples	As and Ca	+	U	1
All water samples	Ba	+	J	2
MW-4-01, MW-5-01, MW-5-01D, AND MW-8-01.	As	+ / U	J / UJ	3
MPT2MW-1-01, MW-15D-01, MW-15S-01, MW-4-01, -5-01 AND MW-5-01D.	Pb			
MPT2MW-1-01, -2-01, -3-01, -6-01 AND MPT2MW-6-01.	Se			
MPT2MW-1-01, -7S-01, MW-10-01, TI MW-16D-01 AND MW-8-01.	Tl			

DL - denotes laboratory qualifier/reported value
 + denotes positive values
 U denotes non-detect values

QL - denotes data validation qualifier



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20884**, the analysis of twelve (12) field water sample and no Matrix Spike and Duplicate pair for Cyanide only and nine (9) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. Quality Assurance samples were found in SDG20886. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

000001

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
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All water data stands as reported without qualification.

All water samples The Wet Chemistry will stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 20902

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all %RSDs. One compound, 1,4-dioxane, exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

Four (4) of the continuing calibrations that were analyzed with this data package required qualifications for non compliant %Ds. All of the calibrations require qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations (continued)

Specific findings:

- For the samples listed below, the continuing calibration, BSVH014026, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW	acetone
MPT-RB-05	chloromethane
TRIP BLANK	2-hexanone
MPT-RB-02	acrylonitrile
MPT-RB-03	trans-1,4-dichloro-2-butene
MPT2MW17S	

- For the samples listed below, the continuing calibration, CSV0020610, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW_3	bromomethane
MPT-SW-8	
MPT1MW-1-01	

- For all of the samples, the continuing calibrations contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride and/or acetone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

000403

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 4

Method Blanks (continued)

Specific Findings:

5. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - U

MPT2MW12D
MPTS-1-01
MPT1MW-1-01
MPT2-SW-8
MPT2-SD-8

acetone - CRQL

All samples except
MPT2MW12D

acetone - U

MPT2MW12D

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination for methylene chloride. The trip blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers that will be used to qualify the trip blank: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for trip blank contamination.

methylene chloride - CRQL

MPT-RB-05
MPT2MW17S
MPT-RB-02
MPT-RB-03

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Rinseate/Field Blanks

A rinseate or field blank was not identifiable in this SDG.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The two (2) MS/MSDs exhibited acceptable recoveries and RPDs. No qualifications are required.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

000006

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000007

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW MPT-RB-05 TRIP BLANK MPT-RB-02 MPT-RB-03 MPT2MW17S	acetone chloromethane 2-hexanone acrylonitrile trans-1,4-dichloro-2-butene	+	J	2
VBLKW_3 MPT-SW-8 MPT1MW-1-01	bromomethane	+	J	3
All samples	1,4-dioxane	+/-	J/R	4
MPT2MW12D MPTS-1-01 MPT1MW-1-01 MPT2-SW-8 MPT2-SD-8	methylene chloride	+B	U	5
All samples except MPT2MW12D	acetone	+BJ	CRQL	5
MPT2MW12D	acetone	+B	U	5
MPT-RB-05 MPT2MW17S MPT-RB-02 MPT-RB-03	methylene chloride	+J	CRQL	6

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000008

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS - 601 ANALYSIS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA 601 method; the National Functional Guidelines for Organic Data Review where applicable, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

Sample Group # 92B14C01

System Performance and Overall Assessment

The overall system performance was acceptable. It must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed one instance of non compliance throughout the data package.

- * The laboratory did not provide a Form 4 equivalent for the method blank analyses.

Holding Times

All of the samples, with the exception of one (1) sample, were analyzed within the contractual holding times for volatile analysis. Sample MPT-1-MW-1-01 was analyzed four (4) days outside of the analysis holding times.

Specific findings:

1. For the sample listed below, the analysis holding time was exceeded by four (4) days. Qualify all positive results as estimated (J) and all non detect results as estimated (UJ).

MPT-1-MW-1-01

000001

DATA ASSESSMENT NARRATIVE

VOLATILE 601 ANALYSIS

PAGE - 2

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable. Although the laboratory did not report the initial calibration on an equivalent Form 6, the laboratory submitted all of the calibration plots. Heartland ESI will accept the linear plots. No qualification are required.

Continuing Calibrations

The continuing calibration that was analyzed with this data package was not acceptable for all compound %Ds.

Specific findings:

2. For the samples listed below, the continuing calibration analyzed on 02/26/92 contained the following compounds with non compliant %Ds. Qualify all positive results for these compounds as estimated (J).

MPT-5-1-01	chloromethane
MPT-2-MW-17S	

Method Blanks

The method blanks that were analyzed did not exhibit contamination for target compounds. No qualifications are required.

Trip Blanks

A trip blank was not analyzed with this SDG.

Rinseate/Field Blanks

A rinseate or field blank was not identified.

Surrogates

All of the surrogate recoveries were acceptable. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE 601 ANALYSIS

PAGE - 3

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD was acceptable. No qualifications are required.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000003

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT-1-MW-1-01	All analytes	+/-	J/UJ	1
MPT-5-1-01 MPT-2-MW-17S	chloromethane	+	J	2

- * DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

000005

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20902

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * (43) The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction holding times, with the exception of one sample, and analysis holding times were met for all samples.

Specific findings:

3. For the samples listed below, the extraction holding time was exceeded by fifteen days (15). All sample results are rejected (R) due to the exceeded holding times.

MPT-RB-3_RX

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

One (1) of the initial calibrations that were analyzed by the laboratory for these samples was not acceptable for all compound %RSDs. All RRFs were acceptable.

Specific findings:

4. The initial calibration analyzed on 02/17/92 contained the following compounds with %RSDs greater than 30%. No qualifications are required since samples were not analyzed after the initial calibration.

benzidine
1-naphthylamine
2-naphthylamine
4-aminobiphenyl

Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

5. For the samples listed below, the continuing calibration, DSBA010016, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKS	4-nitrophenol
MPT2-SD-8	2,4-dinitrophenol
	1-naphthylamine
	2-naphthylamine
	phenacetin
	4-aminobiphenyl

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

6. For the samples listed below, the continuing calibration, DSBA010016, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_3	2-methyl-
MPT-RB-02	naphthalene
MPT-RB-03	hexachlorobenzene
	benzo(k)fluoranthene
	2-nitroaniline
	bis(2-chloroisopropyl)ether
	2,4-dinitrophenol
	4-nitroaniline
	3,3'-dichlorobenzidine
	2-picoline
	methyl methanesulfonate
	N-nitrosopiperidine
	1-naphthylamine

7. For the samples listed below, the continuing calibration, DSBA010016, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW_3	2-naphthyl-
MPT-RB-02	amine
MPT-RB-03	4-aminobiphenyl
	benzidine

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

8. For the samples listed below, the continuing calibration, ASBA013124, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW	bis(2-chloro-
MPT-RB-05	ethoxy)methane
MPT2MW12D	2-methylnaphthalene
	hexachlorobenzene
	benzo(k)fluoranthene
	4,6-dinitro-2-methylphenol
	3,3'-dichlorobenzidine
	methyl methanesulfonate
	benzidine
	2-naphthylamine
	pentachloronitrobenzene

9. For the samples listed below, the continuing calibration, ASBA013124, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW	2,4-dinitro-
MPT-RB-05	phenol
MPT2MW12D	

10. For the samples listed below, the continuing calibration, DSBA010112, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_4	nitrobenzene
MPT2MW17S	anthrene
MPT2-SW-8	2-nitroaniline
	4-nitrophenol
	4,6-dinitro-2-methylphenol
	N-nitrosopiperidine
	1-naphthylamine
	2-naphthylamine
	phenacetin
	p-dimethylaminoazobenzene

000005

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

11. For the samples listed below, the continuing calibration, DSBA010112, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW_4	benzo(b)fluoranthene
MPT2MW17S	benzidine
MPT2-SW-8	

12. For the samples listed below, the continuing calibration, DSBA010132, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_2	4-nitrophenol
MPTS-1-01	methyl methanesulfonate
MPT1MW-1-01	2-naphthylamine

13. For the samples listed below, the continuing calibration, DSBA010132, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW_2	benzidine
MPTS-1-01	
MPT1MW-1-01	

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for TCLs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

000006

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Method Blanks (continued)

Specific findings:

14. The following samples have been qualified for method blank contamination.

di-n-butylphthalate - CRQL

MPT-RB-05
MPT2MW12D
MPT2MW17S
MPTS-1-01
MPT1MW-1-01

pentachlorophenol - CRQL

MPTS-1-01
MPT1MW-1-01

Surrogates

All of the surrogate recoveries, with the exception on one (1) recovery, were within QA/QC criteria.

Specific findings:

15. For the sample listed below, one (1) acid surrogate exhibited a recovery less than 10%. For the acid fraction, qualify all positive results as estimated (J) and reject (R) all non detect results.

MPT-RB-03

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was analyzed with this SDG.

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

000007

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Compound Identification/Quantitation

No qualifications are required.

000008

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000009

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000010

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000011

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
MPT-RB-3_RX	all analytes	+/-	R	3
SBLKS MPT2-SD-8	4-nitrophenol 2,4-dinitrophenol 1-naphthylamine 2-naphthylamine phenacetin 4-aminobiphenyl	+	J	5
SBLKW_3 MPT-RB-02 MPT-RB-03	2-methyl- naphthalene hexachlorobenzene benzo(k)fluoranthene 2-nitroaniline bis(2-chloroisopropyl)ether 2,4-dinitrophenol 4-nitroaniline 3,3'-dichlorobenzidine 2-picoline methyl methanesulfonate N-nitrosopiperidine 1-naphthylamine	+	J	6
SBLKW_3 MPT-RB-02 MPT-RB-03	2-naphthyl- amine 4-aminobiphenyl benzidine	+/-	J/UJ	7

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000012

SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
SBLKW MPT-RB-05 MPT2MW12D	bis(2-chloro-ethoxy)methane 2-methylnaphthalene hexachlorobenzene benzo(k)fluoranthene 4,6-dinitro-2-methylphenol 3,3'-dichlorobenzidine methyl methanesulfonate benzidine 2-naphthylamine pentachloronitrobenzene	+	J	8
SBLKW MPT-RB-05 MPT2MW12D	2,4-dinitro-phenol	+/-	J/UJ	9
SBLKW_4 MPT2MW17S MPT2-SW-8	nitrobenzene anthrene 2-nitroaniline 4-nitrophenol 4,6-dinitro-2-methylphenol N-nitrosopiperidine 1-naphthylamine 2-naphthylamine phenacetin p-dimethylaminoazobenzene	+	J	10
SBLKW_4 MPT2MW17S MPT2-SW-8	benzo(b)fluoranthrene benzidine	+/-	J/UJ	11

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000013

SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
SBLKW_2 MPTS-1-01 MPT1MW-1-01	4-nitrophenol methyl methanesulfonate 2-naphthylamine	+	J	12
SBLKW_2 MPTS-1-01 MPT1MW-1-01	benzidine	+/-	J/UJ	13
MPT-RB-05 MPT2MW12D MPT2MW17S MPTS-1-01 MPT1MW-1-01	di-n-butyl- phthalate	+BJ	CRQL	14
MPTS-1-01 MPT1MW-1-01	pentachloro- phenol	+BJ	CRQL	14
MPT-RB-03	Acid fraction	+/-	J/R	15

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000014

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20902

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported - due to poor recovery from spiking studies performed at the laboratory".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides were presented using non-linear quadratic model statistics. The correlations were acceptable. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations were within QC limits with only one exception. Delta-BHC was slightly above the 15% D QC limit in one continuing calibration. Although the difference was due to a decrease in response for this compound, neither of the reported samples appear to be associated with this continuing calibration based on the file IDs. No qualifications were required based on the data presented.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to generated by laboratory control charting procedures. The surrogate recovery for sample MPT1MW-1-01 was somewhat low (56%) but did not require qualification.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was included in this data package. All Recoveries for the Blank Spike included for the water matrix were within QC limits. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result
+ in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20902**, the analysis of eight (8) field water sample and one Matrix Spike and Duplicate pair for TAL Metals and seven (7) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Silver 2.3 ug/l

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

Interferences

No significant interferences were observed.



Metals Data Assessment Narrative (continued - Page 2)

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

2. The following samples exhibited poor recoveries during the Analytical spiking for GFAA. All positive and non-detect results are qualified as estimated, "J" or "UJ".

<u>Analyte</u>	<u>Sample Numbers</u>
Arsenic	MW-17D AND 2-SW-8.
Lead	MW-17D.
Selenium	MW-17S, MW-17D, MW-1-01 AND MW-2-SW-8.
Thallium	MW-1-01, MW-1-01 AND MW2-SW-8.

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.



SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples	Ag	+	U	1
MW-17D AND MW2-SW-8. MW-17D. MW-17S, MW-17D, MW1-01 AND MW2-SW-8. MW-1-01, MW1-01AND MW2-SW-8. TI	As Pb Se	+/U	J/UJ	2

All water samples The Wet Chemistry will stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 20931

System Performance and Overall Assessment

The overall system performance was poor. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all %RSDs. The initial calibration did not meet RRF criteria for one compound, 1,4-dioxane, which exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

The continuing calibration that was analyzed with this data package required qualifications for non compliant %Ds. The calibration requires qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations (continued)

Specific findings:

2. For the samples listed below, the continuing calibration, BSVH014284, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

All samples	bromodichloro- methane trans-1,4-dichloropropene bromoform acetone carbon disulfide methylene chloride trichlorofluoromethane trans-1,4-dichloro-2-butene
-------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

3. For the samples listed below, the continuing calibration, BSVH014284, contained the following compounds with %Ds greater than 50% D, but less than 90% D. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

All samples	1,1,1-tri- chloroethane carbon tetrachloride bromofluorobenzene (surrogate)
-------------	--------------------------------------------------------------------------------------

4. For the samples listed below, the continuing calibration, BSVH014284, contained the following compounds with %Ds greater than 90% D. Qualify all positive results for these compounds as estimated (J) and reject (R) all non detect results.

All samples	1,2-dichloro- ethane 1,2-dichloroethane-d ₄ (surrogate)
-------------	--------------------------------------------------------------------------

5. For all of the samples, the continuing calibration contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 4

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for acetone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

6. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

acetone - CRQL

TRAVEL BLANK

acetone - U

MPT2MW16DD01

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination for acetone that was attributed to the method blank. In addition, the trip blank exhibited contamination for methylene chloride. The trip blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank/trip blank qualifiers: CRQL, U and No Action.

Specific findings:

7. The following samples have been qualified for trip blank contamination.

All samples

methylene - CRQL
chloride

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Rinseate/Field Blanks

The rinseate and field blank exhibited contamination that was attributed to the method blanks and trip blank. Chlorobenzene and chloroform was also detected in the rinseate blank. The rinseate blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank/trip blank qualifiers: CRQL, U and No Action.

Specific findings:

8. The following samples have been qualified for rinseate blank contamination.

MPT2MW16DD01 chloroform - CRQL

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A MS/MSD was not submitted with this SDG.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

000006

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	bromodichloro- methane trans-1,4-dichloropropene bromoform acetone carbon disulfide methylene chloride trichlorofluoromethane trans-1,4-dichloro-2-butene	+	J	2
All samples	1,1,1-tri- chloroethane carbon tetrachloride	+/-	J/UJ	3
All samples	1,2-dichloro- ethane	+/-	J/R	4
All samples	1,4-dioxane	+/-	R	5
TRAVEL BLANK	acetone	+BJ	CRQL	6
MPT2MW16DD01	acetone	+B	U	6
All samples	methylene chloride	+J	CRQL	7
MPT2MW16DD01	chloroform	+J	CRQL	8

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000008

X

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20931

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction holding times and analysis holding times were met for all samples. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Initial Calibrations

One (1) of the initial calibrations that were analyzed by the laboratory for these samples was not acceptable for all compound %RSDs. All RRFs were acceptable.

Specific findings:

3. The initial calibration analyzed on 02/17/92 contained the following compounds with %RSDs greater than 30%. No qualifications are required since samples were not analyzed after the initial calibration.

benzidine
1-naphthylamine
2-naphthylamine
4-aminobiphenyl

Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

4. For the samples listed below, the continuing calibration, DSBA010112, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

All samples	nitrobenzene
	anthracene
	2-nitroaniline
	4-nitrophenol
	4,6-dinitro-2-methylphenol
	N-nitrosopiperidine
	1-naphthylamine
	2-naphthylamine
	phenacetin

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 4

Continuing Calibrations (continued)

5. For the samples listed below, the continuing calibration, DSBA010112, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

All samples	benzidine
	benzo(b)fluoranthene

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for TCLs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for method blank contamination.

di-n-butylphthalate - CRQL

MPT2MW16DD01

Surrogates

All of the surrogate recoveries were within QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

A MS/MSD was not submitted with this SDG.

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 5

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000006

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000007

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form 1s in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000008

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
All samples	nitrobenzene anthracene 2-nitroaniline 4-nitrophenol 4,6-dinitro-2-methylphenol N-nitrosopiperidine 1-naphthylamine 2-naphthylamine phenacetin	+	J	4
All samples	benzidine benzo(b)fluoranthene	+/-	J/UJ	5
MPT2MW16DD01	di-n-butyl- phthalate	+BJ	CRQL	6

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20753

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported -due to poor recovery from spiking studies performed at the laboratory".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides presented were acceptably linear. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations were within QC limits with only one exception. The Appendix IX compound Diallate was slightly above the 15% D QC limit (16%) in one continuing calibration. The difference was due to an increase in response for this compound. Therefore, the associated non-detect sample results were not qualified. No qualifications were required based on the continuing calibration results presented.

Blanks

None of the reported Form Is for Method blanks for any fraction showed confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to have been established using appropriate Control Charting procedures by the laboratory.

Matrix Spike/Matrix Spike Duplicate

All reported Recoveries and RPDs for the MS/MSD included in this data package were within QC limits. The Recoveries for the Blank Spikes included for each matrix were somewhat low. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

000002

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000003

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result
+ in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20753**, the analysis of three (3) field water samples and no Matrix Spike and Duplicate pair and eight (8) field soil samples and no Matrix Spike and Duplicate pair for TAL Metals and eight field water samples for Wet Chemistry. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The Laboratory performed a Matrix Spike and Duplicate on samples from a different site and are not acceptable. The All other protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Cadmium	3.3	ug/l	Lead	0.496	mg/kg
			Vanadium	0.694	mg/kg
			Zinc	3.849	mg/kg

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

2. The preparation blank exhibited negative bias for the following element.

Beryllium	-1.1	ug/l	Copper	-0.805	mg/kg
Vanadium	-3.0	ug/l	Silver	-0.632	mg/kg



Metals Data Assessment Narrative (continued - Page 2)

All sample values within ten times the preparation blank contamination and non-detect results are qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. No Matrix Spike for this SDG. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

4. The Duplicate Analysis for this SDG. All positive and non-detect results are qualified as estimated, "J" or "UJ".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.



SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples All soil samples	Pb, V, Zn. Cd	+	J	1
All water samples All soil samples	Be and V Cu and Ag	+/U	J/UJ	2
All samples	All analytes	+/U	J/UJ	3
All samples	All analytes	+/U	J/UJ	4

All water samples The Wet Chemistry will stand as reported without qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; SW-846, Method 8240; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 20781

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all criteria and non criteria %RSDs. One compound, 1,4-dioxane, exhibited a RRF less than 0.05. However, qualifications are not required since samples were not analyzed after the initial calibration.

Continuing Calibrations

The continuing calibrations that was analyzed with this data package required qualifications for non compliant %Ds and RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations (continued)

Specific findings:

2. For the samples listed below, the continuing calibration, CSVO020247, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

SBLKW	1,2-dichloroethane-d ₄
SBLKS	trichlorofluoromethane
TRIP BLANK5	carbon tetrachloride
MPT-2-DM-1	1,3-dichlorobenzene
MPT-2-PG-1	1,2-dichlorobenzene
MPT-2-PK-1	

3. For all of the samples, 1,4-dioxane exhibited a RRF less than 0.05 in the continuing calibration, CSVO020247. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone and 2-butanone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

3. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - U

All samples

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 4

Method blanks (Specific finding #3 continued)

acetone - U

TRIP_BLANK5
MPT-2-PG-1
MPT-2-PK-1

acetone - NA

MPT-2-DM-1

2-butanone - CRQL

TRIP_BLANK5
MPT-2-PK-1
MPT-2-DM-1

2-butanone - U

MPT-2-PG-1

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination that was attributed to the associated method blank. No qualifications are required.

Surrogates

All of the surrogates recoveries were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A MS/MSD was not submitted with this SDG.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 5

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
SBLKW SBLKS TRIP BLANK5 MPT-2-DM-1 MPT-2-PG-1 MPT-2-PK-1	1,2-dichloro-ethane-d ₄ carbon tetrachloride 1,3-dichlorobenzene 1,2-dichlorobenzene trichlorofluoromethane	+	J	2
All samples	1,4-dioxane	+/-	J/R	3
All samples	methylene-chloride	+B	U	4
TRIP_BLANK5 MPT-2-PG-1 MPT-2-PK-1	acetone	+	U	4
MPT-2-DM-1	acetone	+	NA	4
TRIP_BLANK5 MPT-2-PK-1 MPT-2-DM-1	2-butanone	+	CRQL	4
MPT-2-PG-1	2-butanone	+	U	4

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; SW-846, Method 8270, the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20781

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction and analysis holding times were met for all samples.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was not acceptable for all compound %RSDs. The average RRFs for all of the criteria compounds met the initial calibration criteria.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

Initial Calibrations (continued)

Specific Findings:

3. The initial calibration on, 02/10/92, had the following compounds with %RSD greater than 30% RSD. No qualification are required because no samples were analyzed following this calibration

benzo(k)fluoranthene

Continuing Calibrations

The continuing calibration that was analyzed with this data package was acceptable for %Ds. All of the criteria and non criteria compounds met RRF requirements.

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for di-n-butylphthalate. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

4. The following samples have been qualified for blank contamination. Qualification are for all method blanks.

di-n-butylphthalate - CRQL

MPT-2-PG-1

MPT-2-PK-1

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 4

Surrogates

All of the surrogate recoveries were within QA/QC criteria. Qualifications are not required.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD analyzed with these samples.

Blank Spike/Blank Spike Duplicate

No BS/BSDs associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000004

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
MPT-2-PG-1 MPT-2-PK-1	di-n-butyl- phthalate	+	CRQL	4

- * DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

000008



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from Mayport, SDG# 20781, the analysis of three (3) field soil samples and no Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The Laboratory performed a Matrix Spike and Duplicate on samples from a different site and are not acceptable. The All other protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Barium	0.286	mg/kg
Lead	0.55	mg/kg
Selenium	0.246	mg/kg
Zinc	0.276	mg/kg

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

2. The preparation blank exhibited negative bias for the following element.

Silver	-0.444	mg/kg
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003001



Metals Data Assessment Narrative (continued - Page 2)

All sample values within ten times the preparation blank contamination and non-detect results are qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. No Matrix Spike for this SDG. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

4. The Duplicate Analysis for this SDG. All positive and non-detect results are qualified as estimated, "J" or "UJ".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.



SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All soil samples	Ba, Pb, Se, and Zn.	+	U	1
All soil samples	Ag	+/U	J/UJ	2
All soil samples	All analytes	+/U	J/UJ	3
All soil samples	All analytes	+/U	J/UJ	4

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

X

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 20837

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all %RSDs. One compound, 1,4-dioxane, exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

The one (1) continuing calibration that was analyzed with this data package required qualifications for non compliant %Ds. All of the calibrations require qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations (continued)

Specific findings:

2. For the samples listed below, the continuing calibration, CSV0020354, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW	dibromomethane
All samples	1,2-dichlorobenzene
	1,3-dichlorobenzene

3. For all of the samples, the continuing calibrations contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for acetone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

4. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

acetone - CRQL

MPT-FB-01
MPT-RB-01
MPT-22-MW1-01

000003

DATA ASSESSMENT NARRATIVE

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Method Blank (Specific finding #4 continued)

acetone - U

MPT2MW11-01
MPT2MW12S-01
MPT2MW12S-01D
TRAVEL BLANK

Trip Blanks

The trip blank exhibited contamination for methylene chloride. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

5. The following samples have been qualified for trip blank contamination.

methylene chloride - CRQL

All samples

Rinseate/Field Blanks

The rinseate blank and field blank exhibited contamination that was attributed to method blank/trip blank contamination. In addition, chlorobenzene was detected in both samples. However, the associated samples did not exhibit contamination for chlorobenzene, so qualifications are not required.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A MS/MSD was not submitted with this SDG.

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

000006

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW All samples	dibromomethane 1,2-dichlorobenzene 1,3-dichlorobenzene	+	J	2
All samples	1,4-dioxane	+/-	J/R	3
MPT-FB-01 MPT-RB-01 MPT-22-MW1-01	acetone	+BJ	CRQL	4
MPT2MW11-01 MPT2MW12S-01 MPT2MW12S-01D TRAVEL BLANK	acetone	+B	U	4
All samples except TRIP BLANK	methylene chloride	+J	CRQL	5

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000008

X

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20837

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CROL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction holding times and analysis holding times were met for all samples. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Initial Calibrations

The initial calibrations that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and RRFs. No qualifications are required.

Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

3. For the samples listed below, the continuing calibration, ASBA012928, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

All samples	hexachloro- benzene benzo(k)fluoranthene 2-nitroaniline benzoic acid 2-nitroaniline 3,3'-dichlorobenzidine methyl methanesulfonate N-nitrosopiperidine 1-naphthylamine 2-naphthylamine phenacetin
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4. For the samples listed below, the continuing calibration, ASBA012928, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

All samples	bis(2-chloro- isopropyl)ether
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000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for TCLs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

5. The following samples have been qualified for method blank contamination.

di-n-butylphthalate - CRQL

MPT22-MW1-01
MPT2MW11-01
MPT2MW12S-01
MPT2MW12S-01D

Surrogates

All of the surrogate recoveries, with the exception of one (1) recovery, were within QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was submitted with this SDG.

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000004

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

- * All compounds are rejected due to missing initial and continuing calibrations.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

000007

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
All samples	hexachloro- benzene benzo(k)fluoranthene 2-nitroaniline benzoic acid 2-nitroaniline 3,3'-dichlorobenzidine methyl methanesulfonate N-nitrosopiperidine 1-naphthylamine 2-naphthylamine phenacetin	+	J	3
All samples	bis(2-chloro- isopropyl)ether	+/-	J/UJ	4
MPT22-MW1-01 MPT2MW11-01 MPT2MW12S-01 MPT2MW12S-01D	di-n-butyl- phthalate	+BJ	CRQL	5

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000008

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20837

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported -due to poor recovery from spiking studies performed at the laboratory".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides were presented using non-linear quadratic model statistics. The correlations were acceptable. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations were within QC limits with only one exception. Delta-BHC was slightly above the 15% D QC limit in one continuing calibration. Although the difference was due to a decrease in response for this compound, none of the reported samples appear to be associated with this continuing calibration based on the file ids. No qualifications were required based on the data presented.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to be those utilized by the USEPA CLP under the 2/88 SOW.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was included in this data package. One Recovery for the Blank Spike included for the water matrix was somewhat high. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000003

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

- * DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator
- + in the DL column denotes a positive result
- + in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20837**, the analysis of six (6) field water samples and one Matrix Spike and Duplicate pair for TAL Metals and three (3) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Barium	0.58	ug/l
Calcium	211.6	ug/l
Iron	31.77	ug/l
Magnesium	29.57	ug/l
Manganese	0.84	ug/l
Sodium	880.	ug/l
Zinc	4.11	ug/l

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

Metals Data Assessment Narrative (continued - Page 2)

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

2. The Duplicate Analysis for Zinc was outside the control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples	Ba, Ca, Fe, Mg, Mn, Na and Zn.	+	U	1
All water samples	Zn	+/U	J/UJ	2
All water samples The Wet Chemistry will stands as reported without qualification.				

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 20850

System Performance and Overall Assessment

The overall system performance was poor. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all %RSDs. The initial calibration did not meet RRF criteria for one compound, 1,4-dioxane, which exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

The continuing calibration that was analyzed with this data package was acceptable for all compound %Ds. The calibration requires qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Continuing Calibrations (continued)

Specific findings:

2. For all of the samples, the continuing calibration contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for acetone and methylene chloride. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

3. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - CRQL

MPT13MW-4-01

MPT13MW-5-01

methylene chloride - U

TRAVEL BLANK

acetone - U

TRAVEL BLANK

MPT13MW-5-01

acetone - No Action

MPT13MW-4-01

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 4

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination that was attributed to the method blank. No qualifications are required.

Rinseate/Field Blanks

A rinseate or field blank was not identified.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A MS/MSD was not submitted with this SDG.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000004

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form 1s in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	1,4-dioxane	+/-	R	2
MPT13MW-4-01 MPT13MW-5-01	methylene chloride	+BJ	CRQL	3
TRAVEL BLANK	methylene chloride	+B	U	3
TRAVEL BLANK MPT13MW-5-01	acetone	+B	U	3
MPT13MW-4-01	acetone	+B	NA	3

- * DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

000007

X

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20850

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.

- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

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DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see **Attachment B**) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction holding times and analysis holding times were met for all samples. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 4

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for TCLs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for method blank contamination.

di-n-butylphthalate - CRQL

MPT13MW-4-01

di-n-butylphthalate - U

MPT13MW-5-01

Surrogates

All of the surrogate recoveries were within QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

A MS/MSD was not submitted with this SDG.

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenylenamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000006

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
All samples	benzyl alcohol 1-naphthylamine	+	J	4
All samples	2-naphthyl- amine	+/-	J/UJ	5
MPT13W-4-01	di-n-butyl- phthalate	+BJ	CRQL	6
MPT13W-5-01	di-n-butyl- phthalate	+BJ	U	6

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20850

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported - due to poor recovery from spiking studies performed at the laboratory".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides were presented using non-linear quadratic model statistics. The correlations were acceptable. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations were within QC limits with only one exception. Delta-BHC was slightly above the 15% D QC limit in one continuing calibration. Although the difference was due to a decrease in response for this compound, neither of the reported samples appear to be associated with this continuing calibration based on the file IDs. No qualifications were required based on the data presented.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to be those utilized by the USEPA CLP under the 2/88 SOW.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was included in this data package. All Recoveries for the Blank Spike included for the water matrix were within QC limits. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000003

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

- * DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator
- + in the DL column denotes a positive result
- + in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20850**, the analysis of two (2) field water sample and no Matrix Spike and Duplicate pair for TAL Metals and two (2) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. The Quality Assurance samples were found in SDG 20866. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

The CCV for Tin was out of control. The reviewer was not able to qualify any of the data for this problem because of the lack of raw data.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Calcium	178.	ug/l
Copper	2.53	ug/l
Iron	19.94	ug/l
Manganese	0.44	ug/l
Nickel	7.3	ug/l
Sodium	776.	ug/l
Zinc	12.78	ug/l

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

Metals Data Assessment Narrative (continued - Page 2)

2. The preparation blank exhibited negative bias for the following element.

Mercury -0.164 ug/l

All sample values within ten times the preparation blank contamination and non-detect results are qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recoveries for Lead and Thallium were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".
4. The Matrix Spike recovery for Selenium was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".
5. The Matrix Spike for Mercury was analyzed on a sample from a different site. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.

000002

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples	Ca, Cu, Fe, Mn, Ni, Na and Zn.	+	U	1
All water samples	Hg	+/U	J/UJ	2
All water samples	Pb and Tl	+/U	J/UJ	3
All water samples	Se	U +	R J	4
All water samples	Hg	+/U	J/UJ	5
All water samples The Wet Chemistry will stands as reported without qualification.				

DL - denotes laboratory qualifier/reported value
 + denotes positive values
 U denotes non-detect values

QL - denotes data validation qualifier

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 20866

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see **Attachment A**) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all %RSDs. One compound, 1,4-dioxane, exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

The one (1) continuing calibration that was analyzed with this data package required qualifications for non compliant %Ds. All of the calibrations require qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Continuing Calibrations (continued)

Specific findings:

2. For the samples listed below, the continuing calibration, CSVO020450, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW	dibromomethane
All samples	1,2-dichlorobenzene

3. For all of the samples, the continuing calibrations contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride and/or acetone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

4. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - CRQL

MPT-FB-02

methylene chloride - U

All samples except
MPT-FB-02

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

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Method Blank (Specific finding #4 continued)

acetone - CRQL

MPT2-MW9S-01

acetone - U

All samples except
MPT2-MW9S-01

Trip Blanks

A trip blank was not identified with this SDG.

Rinseate/Field Blanks

The rinseate blank and field blank exhibited contamination that was attributed to method blank contamination. In addition, chlorobenzene was detected in both samples. However, the associated samples did not exhibit contamination for chlorobenzene, so qualifications are not required.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD exhibited acceptable recoveries and RPDs. No qualifications are required.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000004

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile

3-Chloropropene

Propionitrile

Methacrylonitrile

Methyl Methacrylate

1,2-Dibromoethane

1,1,1,2-Tetrachloroethane

1,2-Dibromo-3-Chloropropane

Pentachloroethane

Isobutyl alcohol

Chloropropene

000005

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW All samples	dibromomethane 1,2-dichlorobenzene	+	J	2
All samples	1,4-dioxane	+/-	J/R	3
MPT-FB-02	methylene chloride	+BJ	CRQL	4
All samples except MPT-FB-02	methylene chloride	+B	U	4
MPT2-MW9S-01	acetone	+BJ	CRQL	4
All samples except MPT2-MW9S-01	acetone	+B	U	4

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000007

X

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 20866

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

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Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction holding times and analysis holding times were met for all samples. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Initial Calibrations

One (1) of the initial calibrations that were analyzed by the laboratory for these samples was not acceptable for all compound %RSDs. All RRFs were acceptable.

Specific findings:

3. The initial calibration analyzed on 02/17/92 contained the following compounds with %RSDs greater than 30%. No qualifications are required since samples were not analyzed after the initial calibration.

benzidine
1-naphthylamine
2-naphthylamine
4-aminobiphenyl

Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

4. For the samples listed below, the continuing calibration, ASBA012928, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

MPT2-MW9D01	hexachlorobenzene
MPT-FB-02	benzo(k)fluoranthene
MPT-RB-02	2-nitroaniline
	benzoic acid
	2-nitroaniline
	3,3'-dichlorobenzidine
	methyl methanesulfonate
	N-nitrosopiperidine
	1-naphthylamine
	2-naphthylamine
	phenacetin
	4-aminobiphenyl

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

5. For the samples listed below, the continuing calibration, ASBA012928, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

MPT2-MW9D01	bis(2-chloroiso-
MPT-FB-02	propyl)ether
MPT-RB-02	

6. For the samples listed below, the continuing calibration, ASBA012943, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_2	bis(2-chloro-
MPT2-MW301	ethoxy)methane
MPT2MW301MS	hexachlorobenzene
MPT2MW301MSD	benzo(k)fluoranthene
	2-nitroaniline
	bis(2-chloroisopropyl)ether
	2,4-dinitrophenol
	4-nitrophenol
	3,3'-dichlorobenzidine

7. For the samples listed below, the continuing calibration, DSBA009981, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW_3	benzyl alcohol
MPT2-MW9S-01	1-naphthylamine

8. For the samples listed below, the continuing calibration, DSBA009981, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW_3	
MPT2-MW9S-01	2-naphthylamine

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 5

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for TCLs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

9. The following samples have been qualified for method blank contamination.

di-n-butylphthalate - CRQL

All samples

Surrogates

All of the surrogate recoveries, with the exception of one (1) recovery, were within QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

The MS/MSD spike recoveries were acceptable for all of the compounds. Two (2) RPDs were outside of QA/QC limits. No qualifications are required.

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenylenamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000007

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
MPT2-MW9D01	hexachloro- benzene	+	J	4
MPT-FB-02	benzo(k)fluoranthene			
MPT-RB-02	2-nitroaniline			
	benzoic acid			
	2-nitroaniline			
	3,3'-dichlorobenzidine			
	methyl methanesulfonate			
	N-nitrosopiperidine			
	1-naphthylamine			
	2-naphthylamine			
	phenacetin			
	4-aminobiphenyl			
MPT2-MW9D01	bis(2-chloroiso- propyl)ether	+/-	J/UJ	5
MPT-FB-02				
MPT-RB-02				
SBLKW_2	bis(2-chloro- ethoxy)methane	+	J	6
MPT2-MW301	hexachlorobenzene			
MPT2MW301MS	benzo(k)fluoranthene			
MPT2MW301MSD	2-nitroaniline			
	bis(2-chloroisopropyl)ether			
	2,4-dinitrophenol			
	4-nitrophenol			
	3,3'-dichlorobenzidine			

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
SBLKW_3 MPT2-MW9S-01	benzyl alcohol 1-naphthylamine	+	J	7
SBLKW_3 MPT2-MW9S-01	2-naphthylamine	+/-	J/UJ	8
All samples	di-n-butyl- phthalate	+BJ	CRQL	9

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000010

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20866

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported - due to poor recovery from spiking studies performed at the laboratory".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest

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Initial Calibration (continued)

standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides were presented using non-linear quadratic model statistics. The non-CLP Appendix IX analytes were not presented for the confirmation column. The reviewer assumes the primary "hit" requiring confirmation was among these compounds. All quadratic correlations were acceptable. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations were within QC limits with only one exception. Delta-BHC was slightly above the 15% D QC limit in one continuing calibration. Although the difference was due to a decrease in response for this compound, none of the reported samples appear to be associated with this continuing calibration based on the file IDs. No qualifications were required based on the data presented.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to be those utilized by the USEPA CLP 2/88 SOW.

Matrix Spike/Matrix Spike Duplicate

The MS/MSD included in this data package exhibited extremely low recoveries for Methoxychlor, while all recoveries for the Blank Spike were within QC limits.

Specific Finding

1. The non-detect results reported for Methoxychlor in sample MPT-MW301 are rejected, "R", due to the extremely low recoveries in the MS/MSD.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

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SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT-MW301	Methoxychlor	U	R	1

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result

+ in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20866**, the analysis of five (5) field water sample and one Matrix Spike and Duplicate pair for TAL Metals and three (3) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Calcium	178.	ug/l
Copper	2.53	ug/l
Iron	19.94	ug/l
Manganese	0.44	ug/l
Nickel	7.3	ug/l
Sodium	776.	ug/l
Zinc	12.78	ug/l

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".



Metals Data Assessment Narrative (continued - Page 2)

Interferences

No significant interferences were observed.

Spike Recovery

2. The Matrix Spike recoveries for Lead and Thallium were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".
3. The Matrix Spike recovery for Selenium was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

4. The following samples exhibited poor recoveries during the Analytical spiking for GFAA. All positive and non-detect results are qualified as estimated, "J" or "UJ".

<u>Analyte</u>	<u>Sample Numbers</u>
Arsenic	MPT2-MW301
Lead	MPT2-MW301
Thallium	MPT2-MW301

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.



SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples	Ca, Cu, Fe, Mn, Ni, Na and Zn.	+	U	1
All water samples	Pb and Tl	+/U	J/UJ	2
All water samples	Se	U +	R J	3
MPT2-MW301 MPT2-MW301 MPT2-MW301	As Pb Tl	+/U	J/UJ	4
All water samples The Wet Chemistry will stands as reported without qualification.				

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 20931

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound from this fraction, Kepone, was "Not Reported - due to poor recovery from spiking studies performed at the laboratory".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits. No surrogate retention time information was available. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

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Initial Calibration

The single-component pesticides were analyzed using an initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples. No information regarding the Aroclor initial calibrations was contained in the data package.

The initial calibration for the single-component pesticides were presented using non-linear quadratic model statistics. The correlations were acceptable. No qualification of the reported results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations were within QC limits with only one exception. Delta-BHC was slightly above the 15% D QC limit in one continuing calibration. Although the difference was due to a decrease in response for this compound, neither of the reported samples appear to be associated with this continuing calibration based on the file IDs. No qualifications were required based on the data presented.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to generated by laboratory control charting procedures.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was included in this data package. All Recoveries for the Blank Spike included for the water matrix were within QC limits. No qualifications were required.

Analyte Identification/Quantitation

All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

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SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No specific findings were identified which resulted in the qualification of any of the reported non-detect sample results.

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result
+ in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 20931**, the analysis of two (2) field water sample and one Matrix Spike and Duplicate pair for TAL Metals and one (1) field water samples for Wet Chemistry analyses. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Silver 2.3 ug/l

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".

Interferences

No significant interferences were observed.

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Metals Data Assessment Narrative (continued - Page 2)

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

2. The following samples exhibited poor recoveries during the Analytical spiking for GFAA. All positive and non-detect results are qualified as estimated, "J" or "UJ".

<u>Analyte</u>	<u>Sample Numbers</u>
Lead	MW-16DD-01
Selenium	MW-16DD-01

Wet Chemistry

The samples were reviewed for holding times, detection limit and LCSs.



SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples	Ag	+	U	1
MW-16DD-01	Pb	+ / U	J / UJ	2
MW-16DD-01	Se			

All water samples The Wet Chemistry will stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 21018

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * (43) The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

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DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction and analysis holding times were met for all samples.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were acceptable for all compound %RSDs and RRFs. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

3. For the samples listed below, the continuing calibration, ASBA013222, contained the following compounds with %Ds greater than 25%. Qualify all positive results for these compounds as estimated (J).

SBLKW	2-methylphenol
MPT2QS1	2,4-dinitrophenol
	4-nitrophenol
	bis(2-ethylhexyl)phthalate
	methyl methanesulfonate
	benzidine
	2,3,4,6-tetrachlorophenol

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed did not exhibit contamination for TCLs or TICs. No qualifications are required.

Surrogates

All of the surrogate recoveries were within QA/QC criteria. Qualifications are not required.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was analyzed with this SDG.

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 4

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000004

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000006

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
SBLKW MPT2QS1	2-methylphenol 2,4-dinitrophenol 4-nitrophenol bis(2-ethylhexyl)phthalate methyl methanesulfonate benzidine 2,3,4,6-tetrachlorophenol	+	J	3

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000008

DATA ASSESSMENT NARRATIVE

PCBs ONLY - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 21018

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

Specific Finding

1. The laboratory performed only a single-point initial calibration for the target PCBs (Aroclors). Although this is the routine USEPA CLP procedure, the reviewer believes "PCB only" analysis requires adherence to the SW846 Method 8080 requirements for a five-point initial calibration. In addition, no continuing calibrations for the target or reported Aroclors were reported. For these reasons, the reviewer has chosen to qualify all reported positive Aroclor results as quantitatively estimated, "J".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits, although this breakdown information is not required for PCB only analysis. No surrogate retention time information was available. No qualifications were made based on instrument performance.

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Initial Calibration

The calibrations for the single-component pesticides were presented using an initial five-point calibrations. No information regarding PCB calibrations were present in any of the PCB only packages. The reviewer requested that run logs be submitted to assure that the laboratory analyzed at least a single concentration Aroclor standard. These run logs were subsequently received by the validator and reviewed to confirm the single-point initial calibration procedures. All reported positive results are quantitatively qualified based on this single-point initial calibration as described previously.

Continuing Calibrations

No continuing calibrations were reported for the target Aroclor compounds. All reported positive results for the reported PCBs were qualified based on the lack of continuing calibrations for the Aroclors.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits, with the exception of those samples in which DBC was diluted-out for the quantitation of the reported Aroclor. Recovery limits for the surrogates appear to generated by laboratory control charting procedures. No qualifications were required.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was included in this data package. All Recoveries for the Blank Spike included for the soil matrix were within QC limits. No qualifications were required.

Analyte Identification/Quantitation

The method of Aroclor quantitation could not be determined from the information presented in this package. The laboratory is reminded that sample dilutions greater than 1:10 should be accompanied by analysis at lesser dilutions to ensure the lowest possible reporting limits for the non-reported target analytes. All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All	All	+	J	1

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result

+ in the QL column denotes a reviewer revised result



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Mayport, SDG# 21018**, the analysis of one (1) field water sample and no Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Arsenic	0.69	ug/l
Barium	0.87	ug/l
Chromium	2.90	ug/l
Copper	19.54	ug/l
Nickel	5.13	ug/l
Zinc	13.65	ug/l

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".



Metals Data Assessment Narrative (continued - Page 2)

Interferences

No significant interferences were observed.

Spike Recovery

2. The Laboratory used a sample from a different site for the Quality Assurance. Therefore all positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

3. The Laboratory used a sample from a different site for the Quality Assurance. Therefore all positive and non-detect results are qualified as estimated, "J" or "UJ".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.



SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples	As, Ba, Cr, Cu, Ni, Zn.	+	U	1
All water samples	All analytes	+ /U	J/UJ	2
All water samples	All analytes	+ /U	J/UJ	3

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE

PCBs ONLY - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 21029

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

Specific Finding

1. The laboratory performed only a single-point initial calibration for the target PCBs (Aroclors). Although this is the routine USEPA CLP procedure, the reviewer believes "PCB only" analysis requires adherence to the SW846 Method 8080 requirements for a five-point initial calibration. In addition, no continuing calibrations for the target or reported Aroclors were reported. For these reasons, the reviewer has chosen to qualify all reported positive Aroclor results as quantitatively estimated, "J".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits, although this breakdown information is not required for PCB only analysis. No surrogate retention time information was available. No qualifications were made based on instrument performance.

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Initial Calibration

The calibrations for the single-component pesticides were presented using an initial five-point calibrations. No information regarding PCB calibrations were present in any of the PCB only packages. The reviewer requested that run logs be submitted to assure that the laboratory analyzed at least a single concentration Aroclor standard. These run logs were subsequently received by the validator and reviewed to confirm the single-point initial calibration procedures. All reported positive results are quantitatively qualified based on this single-point initial calibration as described previously.

Continuing Calibrations

No continuing calibrations were reported for the target Aroclor compounds. All reported positive results for the reported PCBs were qualified based on the lack of continuing calibrations for the Aroclors.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits, with the exception of those samples in which DBC was diluted-out for the quantitation of the reported Aroclor. Recovery limits for the surrogates appear to generated by laboratory control charting procedures. No qualifications were required.

Matrix Spike/Matrix Spike Duplicate

No Recoveries were obtained for the MS/MSD was included in this data package due to the presence of the spike compound, AR1260, in high concentration in the unspiked sample. All Recoveries for the Blank Spike included for the soil matrix were within QC limits. No qualifications were required.

Analyte Identification/Quantitation

The method of Aroclor quantitation could not be determined from the information presented in this package. The laboratory is reminded that sample dilutions greater than 1:10 should be accompanied by analysis at lesser dilutions to ensure the lowest possible reporting limits for the non-reported target analytes. All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All	All	+	J	1

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result
+ in the QL column denotes a reviewer revised result

DATA ASSESSMENT NARRATIVE

PCBs ONLY - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 21042

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

Specific Finding

1. The laboratory performed only a single-point initial calibration for the target PCBs (Aroclors). Although this is the routine USEPA CLP procedure, the reviewer believes "PCB only" analysis requires adherence to the SW846 Method 8080 requirements for a five-point initial calibration. In addition, no continuing calibrations for the target or reported Aroclors were reported. For these reasons, the reviewer has chosen to qualify all reported positive Aroclor results as quantitatively estimated, "J".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits, although this breakdown information is not required for PCB only analysis. No surrogate retention time information was available. No qualifications were made based on instrument performance.

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Initial Calibration

The calibrations for the single-component pesticides were presented using an initial five-point calibrations. No information regarding PCB calibrations were present in any of the PCB only packages. The reviewer requested that run logs be submitted to assure that the laboratory analyzed at least a single concentration Aroclor standard. These run logs were subsequently received by the validator and reviewed to confirm the single-point initial calibration procedures. All reported positive results are quantitatively qualified based on this single-point initial calibration as described previously.

Continuing Calibrations

No continuing calibrations were reported for the target Aroclor compounds. All reported positive results for the reported PCBs were qualified based on the lack of continuing calibrations for the Aroclors.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits, with the exception of those samples in which DBC was diluted-out for the quantitation of the reported Aroclor. Recovery limits for the surrogates appear to generated by laboratory control charting procedures. No qualifications were required.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was included in this data package. All Recoveries for the Blank Spike included for the soil matrix were within QC limits. No qualifications were required.

Analyte Identification/Quantitation

The method of Aroclor quantitation could not be determined from the information presented in this package. The laboratory is reminded that sample dilutions greater than 1:10 should be accompanied by analysis at lesser dilutions to ensure the lowest possible reporting limits for the non-reported target analytes. All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All	All	+	J	1

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result

+ in the QL column denotes a reviewer revised result

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 21060

System Performance and Overall Assessment

The overall system performance was poor. The continuing calibration supplied by the laboratory for this SDG contained many non compliant compounds. In addition, the laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three (43) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see **Attachment B**) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction and analysis holding times were met for all samples.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were acceptable for all compound RRFs. Benzidine, 1-naphthylamine, 2-naphthylamine, and 4-aminobiphenyl exceeded 30%RSD. No qualifications are required since samples were not analyzed after the initial calibration.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

3. For the samples listed below, the continuing calibration, DSBA010164, contained the following compounds with %Ds greater than 25%. Qualify all positive results for these compounds as estimated (J).

SBLKW
MPT2FB2

1-naphthylamine
2,3,4,6-tetrachlorophenol
pentachloronitrobenzene
p-dimethylaminoazobenzene
bis(2-chloroethyl)ether
1,2-dichlorobenzene
1,3-dichlorobenzene
2-methylphenol
4-methylphenol
isophorone
bis(2-chloroethoxy)methane
2,6-dinitrotoluene
2,4-dinitrotoluene
hexachlorobenzene
phenol-d₅
3-nitroaniline
2,4-dinitrophenol
butylbenzylphthalate
bis(2-ethylhexyl)phthalate
benzyl alcohol

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Continuing Calibrations (continued)

4. For the samples listed below, the continuing calibration, DSBA010164, contained the following compounds with %Ds greater than 50%, but less than 90%. Qualify all positive results for these compounds as estimated (J) and all non detect results as estimated (UJ).

SBLKW	N-nitroso-di-
MPT2FB2	n-propylamine
	hexachloroethane
	ethyl methanesulfonate

5. For the samples listed below, the continuing calibration, DSBA010164, contained the following compounds with %Ds greater than 90%. Qualify all positive results for these compounds as estimated (J) and reject (R) all non detect results.

SBLKW	bis(2-chloroiso-
MPT2FB2	propyl)ether
	4-nitroaniline

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for bis(2-ethylhexyl)-phthalate. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following sample has been qualified for method blank contamination.

bis(2-ethylhexyl)phthalate - CRQL

MPT2FB2

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 5

Surrogates

All of the surrogate recoveries, with the exception of one (1), were within QA/QC criteria. This non compliant recovery was above the QA/QC limits, so qualifications are not required.

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was analyzed with this SDG.

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

000006

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

000007

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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All samples	Attachment A	+/-	J/UJ	1
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All samples	Attachment B	+/-	R	2
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SBLKW MPT2FB2	1-naphthylamine 2,3,4,6-tetrachlorophenol pentachloronitrobenzene p-dimethylaminoazobenzene bis(2-chloroethyl)ether 1,2-dichlorobenzene 1,3-dichlorobenzene 2-methylphenol 4-methylphenol isophorone bis(2-chloroethoxy)methane 2,6-dinitrotoluene 2,4-dinitrotoluene hexachlorobenzene 3-nitroaniline 2,4-dinitrophenol butylbenzylphthalate bis(2-ethylhexyl)phthalate benzyl alcohol	+	J	3
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SBLKW MPT2FB2	N-nitroso-di- n-propylamine hexachloroethane ethyl methanesulfonate	+/-	J/UJ	4
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SBLKW MPT2FB2	bis(2-chloroiso- propyl)ether 4-nitroaniline	+/-	J/R	5
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* DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

SUMMARY OF DATA QUALIFICATIONS

PAGE - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPT2FB2	bis(2-ethyl- hexyl)phthalate	+ BJ	CRQL 6	

- * DL denotes the Form I qualifier supplied by the laboratory
- QL denotes the qualifier used by the data validation firm
- + in the DL column denotes a positive result
- in the DL column denotes a non detect result

000010

DATA ASSESSMENT NARRATIVE

PCBs ONLY - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 21060

Contractual Non-Compliance

The laboratory did not provide a CLP Form 9 or equivalent summary of retention time information as required under the NEESA QA Requirements (*NEESA 20.2-047B, June 1988, page 61, Table 7.6*) for Level C Deliverables for the Pesticide/PCB data. No qualification of the reported data was made based on this deficiency.

Specific Finding

1. The laboratory performed only a single-point initial calibration for the target PCBs (Aroclors). Although this is the routine USEPA CLP procedure, the reviewer believes "PCB only" analysis requires adherence to the SW846 Method 8080 requirements for a five-point initial calibration. In addition, no continuing calibrations for the target or reported Aroclors were reported. For these reasons, the reviewer has chosen to qualify all reported positive Aroclor results as quantitatively estimated, "J".

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

This GC analytical fraction was apparently analyzed utilizing internal standards, relative retention times and relative response factors. All percent breakdowns reported were within the required QC limits, although this breakdown information is not required for PCB only analysis. No surrogate retention time information was available. No qualifications were made based on instrument performance.

000001

Initial Calibration

The calibrations for the single-component pesticides were presented using an initial five-point calibrations. No information regarding PCB calibrations were present in any of the PCB only packages. The reviewer requested that run logs be submitted to assure that the laboratory analyzed at least a single concentration Aroclor standard. These run logs were subsequently received by the validator and reviewed to confirm the single-point initial calibration procedures. All reported positive results are quantitatively qualified based on this single-point initial calibration as described previously.

Continuing Calibrations

No continuing calibrations were reported for the target Aroclor compounds. All reported positive results for the reported PCBs were qualified based on the lack of continuing calibrations for the Aroclors.

Blanks

The reported Form I for the Method blank showed no confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits, with the exception of those samples in which DBC was diluted-out for the quantitation of the reported Aroclor. Recovery limits for the surrogates appear to generated by laboratory control charting procedures. No qualifications were required.

Matrix Spike/Matrix Spike Duplicate

All Recoveries and RPDs obtained for the soil MS/MSD included in this data package were acceptable. All Recoveries for the Blank Spike included for the soil matrix were within QC limits. No qualifications were required.

Analyte Identification/Quantitation

The method of Aroclor quantitation could not be determined from the information presented in this package. The laboratory is reminded that sample dilutions greater than 1:10 should be accompanied by analysis at lesser dilutions to ensure the lowest possible reporting limits for the non-reported target analytes. All reported results for these samples are accepted without additional qualification based on the limited information contained in the NEESA Level C deliverables package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

000003

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All	All	+	J	1

* DL denotes the Form I qualifier/value supplied by the laboratory
QL denotes the qualifier/value used by Validator

+ in the DL column denotes a positive result

+ in the QL column denotes a reviewer revised result

000004



DATA ASSESSMENT NARRATIVE
Metals
and Wet Chemistry

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from Mayport, SDG# 21060, the analysis of one (1) field water sample and one Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Barium	1.07	ug/l
Beryllium	0.19	ug/l
Calcium	193.	ug/l
Chromium	3.48	ug/l
Copper	7.71	ug/l
Lead	1.61	ug/l
Iron	37.96	ug/l
Manganese	1.2	ug/l
Sodium	1029.	ug/l
Zinc	8.55	ug/l

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".



Metals Data Assessment Narrative (continued - Page 2)

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

2. The following samples exhibited poor recoveries during the Analytical spiking for GFAA. All positive and non-detect results are qualified as estimated, "J" or "UJ".

<u>Analyte</u>	<u>Sample Numbers</u>
Thallium	MPT2FB2.



SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All water samples	Ba, Be, Ca, Cr, Cu, Pb, Fe, Mn, Na and Zn.	+	U	1
MPT2FB2	TI	+/U	J/UJ	2

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form 1's).

Case # 21171

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of the this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * The laboratory analyzed twelve (12) (see Attachment A) of the twenty-three (23) Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These twelve (12) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.

000001

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory did not analyze separate calibrations for water and soil analyses (E-13/VOA, 2.1.1).
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.

Holding Times

All of the samples were analyzed within the contractual holding times for volatile analysis. No qualification are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

One (1) of the two (2) initial calibrations that was analyzed by the laboratory for these samples was not acceptable for all %RSDs. One compound, acetone, exhibited a %RSD greater than 30%. In addition, the initial calibrations did not meet RRF criteria for one compound, 1,4-dioxane, which exhibited a RRF less than 0.05. No qualifications are required since samples were not analyzed after the initial calibration.

Continuing Calibrations

Two (2) of the three (3) continuing calibrations that were analyzed with this data package required qualifications for non compliant %Ds. All of the calibrations require qualifications for non compliant RRFs.

000002

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

Continuing Calibrations (continued)

Specific findings:

2. For the samples listed below, the continuing calibration, CSVO021087, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKW_2	acetone
VBLKS_2	1,2-dichloroethane
MPTFB04	1,2-dichloroethane-d ₄ (surrogate)
MPT22U2	
MPT22L2	
MPT22U3	
MPT22L3	
MPT22L4	

3. For the samples listed below, the continuing calibration, CSVO021109, contained the following compounds with %Ds greater than 25% D, but less than 50% D. Qualify all positive results for these compounds as estimated (J).

VBLKS_3	acetone
MPT22L2MS	chloromethane
MPT22L2MSD	

4. For all of the samples, the continuing calibrations contained the 1,4-dioxane with a RRF less than 0.05. Qualify all positive results for this compound as estimated (J) and reject (R) all non detect results.

Internal Standards

All of the internal standard EICP areas for the samples and the blanks were within QA/QC limits. No qualifications are required.

000003

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 4

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, chloroform, and/or acetone. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Findings:

5. The following samples have been qualified for blank contamination. Qualifications are for all method blanks.

methylene chloride - U

MPT22U1
MPT22L1
MPT22D1
MPT22U4
MPTFB04
MPT22U2
MPT22L2
MPT22U3
MPT22L3
MPT22L4

acetone - CRQL

MPT22L2
MPT22L4

acetone - U

MPTFB04
MPT22U2
MPT22U3
MPT22L3

000004

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 5

Method Blanks (Specific finding #5 continued)

chloroform - CRQL

**MPTRB01
TRIP BLANK
MPT22U1
MPT22LI
MPT22D1
MPT22U4
MPT22U2
MPT22L2
MPT22U3
MPT22L3
MPT22L4**

Trip Blanks

The trip blank analyzed with this SDG exhibited contamination for chloroform that was attributed to the method blank. In addition, the trip blank exhibited contamination for methylene chloride, acetone, and carbon disulfide. The trip blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank/trip blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for trip blank contamination.

MPT22U1	acetone - U
MPT22LI	acetone - CRQL
MPT22L3	carbon - CRQL disulfide
MPT22U4	acetone - U
MPTRB01	methylene - U chloride acetone - U carbon disulfide - U

000005

DATA ASSESSMENT NARRATIVE

VOLATILE ANALYSIS

PAGE - 6

Rinseate/Field Blanks

The rinseate and field blank exhibited contamination that was attributed to the method blanks and trip blank. Chlorobenzene was also detected in the rinseate blank, but was not detected in any of the associated samples. No qualifications are required.

Surrogates

All of the surrogate recoveries were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The two (2) MS/MSDs exhibited acceptable recoveries and RPDs. No qualifications are required.

Blank Spike/Blank Spike Duplicate (BS/BSD)

No BS/BSDs were analyzed with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000006

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

Acetonitrile
3-Chloropropene
Propionitrile
Methacrylonitrile
Methyl Methacrylate
1,2-Dibromoethane
1,1,1,2-Tetrachloroethane
1,2-Dibromo-3-Chloropropane
Pentachloroethane
Isobutyl alcohol
Chloropropene

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
VBLKW_2 VBLKS_2 MPTFB04 MPT22U2 MPT22L2 MPT22U3 MPT22L3 MPT22L4	acetone 1,2-dichloroethane	+	J	2
VBLKS_3 MPT22L2MS MPT22L2MSD	acetone chloromethane	+	J	3
All samples	1,4-dioxane	+/-	R	4
MPT22U1 MPT22LI MPT22D1 MPT22U4 MPTFB04 MPT22U2 MPT22L2 MPT22U3 MPT22L3 MPT22L4	methylene chloride	+B	U	5
MPT22L2 MPT22L4	acetone	+BJ	CRQL	5

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

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SUMMARY OF DATA QUALIFICATIONS

PAGE - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
MPTFB04 MPT22U2 MPT22U3 MPT22L3	acetone	+B	U	5
MPTRB01 TRIP BLANK MPT22U1 MPT22LI MPT22D1 MPT22U4 MPT22U2 MPT22L2 MPT22U3 MPT22L3 MPT22L4	chloroform	+BJ	CRQL	5
MPT22U1	acetone	+	U	6
MPT22LI	acetone	+J	CRQL	6
MPT22L3	carbon disulfide	+J	CRQL	6
MPT22U4	acetone	+	U	6
MPTRB01	methylene chloride	+	U	6
	acetone	+	U	
	carbon disulfide	+	U	

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000010

X

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 2/88 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C and D. All comments made within this report should be considered when examining the analytical results (Form I's).

Case # 21171

System Performance and Overall Assessment

The overall system performance was fair. The laboratory deviated from the methodology in the analyses of this SDG, which resulted in qualification of the data. In addition, it must be noted that a NEESA Level C data package does not provide the data validator with all of the necessary supporting documentation to investigate the data thoroughly for errors.

Contractual Non Compliance

Heartland ESI observed several instances of non compliance throughout the data package.

- * (43) The laboratory analyzed eighteen (18) (See Attachment A) of the forty-three Appendix IX compounds in a one point continuing calibration mixture analyzed each day before analysis. These eighteen (18) compounds did not have an initial calibration associated with this analysis.
- * The CRQLs reported by the laboratory for the twelve (12) compounds reflect an initial calibration, not the continuing calibration that was analyzed. Additional information was required to support the CRQLS reported by the laboratory due the lack of an initial calibration. The laboratory provided Heartland ESI with a MDL study performed for these compounds, dated June 5, 1991. The twelve (12) compounds are qualified at the reported CRQL as estimated (J/UJ).

000001

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Contractual Non Compliance (continued)

- * The laboratory reported CRQLs for two (2) of the Appendix IX compounds (see Attachment B) which did not have an initial or continuing calibration associated with the analyses. All results for these two (2) compounds will be rejected.
- * The laboratory used the blank qualifier flag (B) incorrectly for method blank contamination on the method blank Form 1s.
- * The laboratory is reporting the wrong method blank ID on the form 4As.

Specific findings:

1. For all of the samples, qualifications are required for the laboratory reported CRQLs that could not be supported for the target compounds listed in Attachment A. Due to the MDL study for these compounds provided by the laboratory, Heartland ESI will accept these CRQLs with the qualification that all non detect results are estimated (UJ). In addition, all positive results for these compounds are qualified as estimated (J) due to the lack of an initial calibration.
2. For all of the samples, rejection is required for the two (2) compounds in Attachment B. The laboratory did not provide calibration data for these two (2) compounds. All results for these compounds are rejected (R).

Holding Times

All extraction holding times and analysis holding times were met for all samples. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

000002

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

Initial Calibrations

One (1) of the initial calibrations that were analyzed by the laboratory for these samples was not acceptable for all compound %RSDs. All RRFs were acceptable.

Specific findings:

3. The initial calibration analyzed on 03/26/92 contained the following compounds with %RSDs greater than 30%. No qualifications are required since samples were not analyzed after the initial calibration.

1-naphthylamine

2-naphthylamine

4-aminobiphenyl

Continuing Calibrations

The continuing calibration that was analyzed with this sample required qualifications for non compliant %Ds. All of the criteria and non criteria compounds met RRF requirements.

Specific Findings:

4. For the samples listed below, the continuing calibration, DSBA013445, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKW

benzoic acid

MPT-FB-04

MPT-RB-01

000003

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 4

Continuing Calibrations (continued)

5. For the samples listed below, the continuing calibration, DSBA010283, contained the following compounds with %Ds greater than 25%, but less than 50%. Qualify all positive results for these compounds as estimated (J).

SBLKS	2-naphthylamine
All samples except	4-aminobiphenyl
MPT-FB-04	
MPT-RB-01	

Internal Standards

All of the blank and sample internal standard EICP areas met the EICP internal standard area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for TCLs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for method blank contamination.

bis(2-ethylhexyl)phthalate - CRQL

All samples except
MPT22U4
MPT22L4

Surrogates

All of the surrogate recoveries were within QA/QC criteria. No qualifications are required.

000004

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 5

Matrix Spike/Matrix Spike Duplicate

No MS/MSD was submitted with this SDG.

Blank Spike/Blank Spike Duplicate

No BS/BSDs were associated with this SDG.

Compound Identification/Quantitation

No qualifications are required.

000005

ATTACHMENT A

Appendix IX Compounds Associated with only a Continuing Calibration

Compound Name

N-Nitrosodiethylamine
N-Nitrosopyrrolidine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
o-Toluidine
Hexachloropropene
p-Phenyleneamine
Safrole
Isosafrole
1,4-Napthoquinone
1,3-Dinitrobenzene
5-Nitro-o-toluidine
1,3,5-Trinitrobenzene
4-Nitroquinoline-1-oxide
Methapyrilene
3,3'-Dimethylbenzidine
2-Acetamidofluorene
Hexachlorophene

ATTACHMENT B

Appendix IX Compounds Associated with No Calibrations

Compound Name

Phenyl-tert-butylamine
Diphenylamine

* All compounds are rejected due to missing initial and continuing calibrations.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
All samples	Attachment A	+/-	J/UJ	1
All samples	Attachment B	+/-	R	2
SBLKW MPT-FB-04 MPT-RB-01	benzoic acid	+	J	4
SBLKS All samples except MPT-FB-04 MPT-RB-01	2-naphthylamine 4-aminobiphenyl	+	J	5
All samples except MPT22U4 MPT22L4	bis(2-ethyl- hexyl)phthalate	+BJ	CRQL	6

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

000009

DATA ASSESSMENT NARRATIVE

ORGANOCHLORINE PESTICIDES AND PCBS - METHOD 8080

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

LABORATORY NUMBER: 21171

Contractual Non-Compliance

No positive hits were identified in any of the samples for any of the analytical fractions. The sample chromatograms included in this NEESA Level C data package were relatively free of significant peaks. No qualification of the reported data was made based on this deficiency.

One Appendix IX compound was "Not Reported - due to poor recovery from spiking studies performed at the laboratory". This compound is: Kepone.

Holding Times

All extraction and analysis hold times were apparently met as indicated by the Chain-of-Custodies and Form 4s included in the package.

GC Instrument Performance

All three GC analytical fractions were apparently analyzed utilizing internal standards, relative retention times and relative response factors. For the Pesticide/PCB analysis, all percent breakdowns reported were within the required QC limits. No surrogate retention time information was available for any fraction. Target compound resolution and potential internal standard or surrogate interferences could not be determined. No qualifications of the reported non-detect results were made based on instrument performance.

000001

Initial Calibration

The laboratory utilized initial five-point calibrations. Only the relative concentrations of the standards used for these calibrations were presented in the limited Level C data package. Thus, none of the reported CRQLs could be verified due to the lack of information regarding concentrations of the lowest standards and final extract volumes for the samples.

No qualifications of the reported non-detect results were required based on the initial calibrations reported.

Continuing Calibrations

All %Ds for all continuing calibrations for all fractions were within QC limits with only one exception.

Blanks

None of the reported Form Is for Method blanks for any fraction showed confirmed positive results above the reported CRQLs. No qualifications were required.

Surrogate Recoveries

All reported sample surrogate recoveries were within the reported QC limits. Recovery limits for the surrogates appear to have been established using appropriate Control Charting procedures by the laboratory.

Matrix Spike/Matrix Spike Duplicate

A MS/MSD was included in this data package. Blank Spikes were included for each analysis. Recoveries were acceptable.

000002

Analyte Identification/Quantitation

No positive results were reported for either sample for any fraction. No additional qualifications of the reported non-detect results were required.

Overall Assessment

The reviewer commends the laboratory for including Forms 8 and 9 in the data package.

QUALIFICATION CODES

U	=	Not detected
J	=	Reported result is quantitatively estimated
UJ	=	Reported quantitation limit is qualified as estimated
R	=	Result is rejected and unusable
N	=	Result is negated, do not consider result in sample
NJ	=	Presumptive evidence for the presence of the material at an estimated concentration

Validation specific findings are noted in numerical form on the Form Is in this data validation report. These specific finding footnotes reflect the conclusions found in the data validation process that resulted in the qualifications of the data.

SUMMARY OF GC DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDINGS</u>
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No qualifications are required
in this Level C data package.

- * DL denotes the Form I qualifier/value supplied by the laboratory
- QL denotes the qualifier/value used by Validator

- + in the DL column denotes a positive result
- + in the QL column denotes a reviewer revised result

000005



DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from Mayport, SDG# ABB13, the analysis of two (2) field water sample and one Matrix Spike and Duplicate pair and nine (9) filed soil samples and one Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. Level C data validation reviews rely on the laboratory filling out the forms correctly. The All protocol requirements were followed.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

1. The preparation blank exhibited contamination for the following elements.

Arsenic	0.44	mg/kg	Calcium	485.6	mg/kg
Copper	41.08	mg/kg	Copper	6.30	mg/kg
Chromium	0.80	mg/kg	Iron	23.61	mg/kg
Iron	5.90	mg/kg	Manganese	0.93	mg/kg
Lead	0.18	mg/kg	Sodium	789.1	mg/kg
Magnesium	60.5	mg/kg	Zinc	7.01	mg/kg
Manganese	0.22	mg/kg			
Nickel	1.16	mg/kg			
Sodium	104.6	mg/kg			
Zinc	0.902	mg/kg			

The USEPA requires that all sample values below five times the preparation blank contamination be qualified as non-detect, "U".



Metals Data Assessment Narrative (continued - Page 2)

2. The preparation blank exhibited negative bias for the following element.

Beryllium	-0.05	mg/kg	Beryllium	-0.38	mg/kg
			Cadmium	-3.15	mg/kg

All sample values within ten times the preparation blank contamination and non-detect results are qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recovery for waters for Lead was below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

4. The Matrix Spike for Soil for Mercury and Cyanide were on a sample not from this site. All data is qualified as estimated, "J" or "UJ".

Duplicate

5. The Duplicate Analyses for soils for Manganese and Zinc were outside the control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

6. The Duplicate Analysis for Mercury and Cyanide were on a sample not from this site. All data is qualified as estimated, "J" or "UJ".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

7. The following analytes exhibited low recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

Analyte	Samples
Selenium	MPT22U4.



000003

SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>	<u>SPECIFIC FINDING</u>
All soil samples	As, Ca, Cr, Fe, Pb, Mg Mn, Ni, Na and Zn.	+	U	1
All water samples	Ca, Cu, Fe, Mn, Na, Zn.			
All soil samples	Be	+ / U	J / UJ	2
All water samples	Be and Cd			
All water samples	Pb	+ / U	J / UJ	3
All water samples	Hg and Cn	+ / U	J / UJ	4
All soil samples	Mn and Zn.	+ / U	J / UJ	5
All water samples	Hg and Cn	+ / U	J / UJ	6
MPT22U4	Se	+ / U	J / UJ	7

DL - denotes laboratory qualifier/reported value
 + denotes positive values
 U denotes non-detect values

QL - denotes data validation qualifier



SDG: 21662

STATE OF CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION

27 May 1992

Attention Greg Brown: SAMPLE ID

This memo offers explanations of the qualifications made to the data for SDG 21662. A copy of this memo should be kept with the data.

Data qualification was made due to four (4) analytical concerns:

- 1) The hold time to analysis for mercury was grossly exceeded. All data for this analyte is rejected and unusable (R).
- 2) The preparation blank run for this SDG contained contamination. Positive preparation contamination occurred for the following analytes: barium, beryllium, chromium, nickel, and zinc. Positive results greater than the CRDL and less than five (5) times the blank results are qualified as estimated (J).
- 3) The duplicate result fell outside the QA/QC limits for zinc. The result is qualified as estimated (J).
- 4) The graphite furnace atomic absorption (GFAA) spike exhibited a low recovery for selenium. The result is qualified as having an estimated quantitation limit (UJ).

The qualifications shown on the form I for this SDG also contain numbers which refer to the issues specified above.

Patrick McGuire

QC - denotes data validation failures
+ denotes positive values
U denotes non-detect values