00428

DEPARTMENT OF THE NAVY
INDIAN HEAD DIVISION
NAVAL SURFACE WARFARE CENTER
101 STRAUSS AVE
INDIAN HEAD MD 20640-5035

5090
Ser 046C/22
8 Mar 00

Mr. Elmer Biles
6315 Indian Head Highway
Indian Head, MD 20640

Dear Mr. Biles:

We are forwarding the minutes from the Installation Restoration (IR) Program Restoration Advisory Board (RAB) meeting that was held on Thursday, February 17, 2000. The meeting was held at the Indian Head Senior Center, which is located at 100 Cornwallis Square, Indian Head, Maryland, 20640.

Please note that the next RAB meeting is scheduled **for June 15, 2000**, from 7:00 - 9:00 p.m. at the Indian Head Senior Center. Please be sure to mark this date on your calendar if you have not already done so.

We are also forwarding all current RAB members a copy of the draft final Remedial Investigation (RI) Report for IR Site 57, Former Drum Disposal Area, Building 292, dated February 2000. We ask that you review this document and provide comments to us by **Monday, April 3, 2000.** Please note that your comments and questions assist us in determining community needs and allow us to address concerns. Anyone that is not a RAB member who would like to review the document can find a copy of it in the Information Repositories.

Included with the hard copy of the RI Report is a CD-ROM disk. The disk contains the report in Adobe Acrobat Reader format (*.pdf), and includes the free Adobe Acrobat Reader program. If you do not have Adobe Acrobat already installed on you computer, then you will need to install it before you can read the "pdf" file. If you need assistance installing the Acrobat Reader, please check for information on the Adobe Acrobat Reader website (http://www.adobe.com/products/acrobat/readermain.html). If you do not have web access, please feel free to contact Mr. Shawn Jorgensen for assistance on (301) 744-6745.

Please note that we continue to search for new RAB members. Therefore, we have enclosed copies of the RAB Membership Form. Please feel free to pass copies of this form to anyone you

believe may be interested in becoming a member of the RAB. You may also find this form and additional information on-line at http://www.ih.navy.mil under the RAB page, which can be found in the Welcome section.

We have also obtained additional information based on questions asked during the RAB meeting. The first question involved IR Site 57, Former Drum Disposal Area. The question was whether we analyzed for both the trans- and cis- isomers of dichloroethylene (DCE) for the RI. The answer is that we did analyze for both cis-DCE and trans-DCE for the RI report.

The second question concerned IR Site 17, Disposed Metal Parts Along Shoreline. The chemical residue in the drums appeared to be wax and analysis of the substance has confirmed this fact. However, other rusted drums located at the site currently do not contain anything. Therefore, the site will be sampled to ensure that the empty drums did not contain chemicals at one time.

Once again, we would like to thank everyone that attended the meeting. We hope to see all of you at the next RAB meeting on Thursday, June 15, 2000, at the Indian Head Senior Center.

If you have any additional comments or questions concerning these matters, you may contact Mr. Shawn Jorgensen on (301) 744-6745.

Sincerely,

CHERYL D. DESKINS
Director, Waste Management and
Prevention Division
By direction of the Commander

Encl:
(1) Minutes from RAB Meeting of 17 Feb 00
(2) IR Site 57 RI Report of Feb 00
(3) RAB Membership Form

Copy to:
RAB Members
Meeting Attendees (w/o encl [2])
Interested Parties (w/o encl [2])

INSTALLATION RESTORATION PROGRAM

INDIAN HEAD DIVISION,
NAVAL SURFACE WARFARE CENTER
101 STRAUSS AVENUE
INDIAN HEAD, MARYLAND
20640-5035

Naval Sea Systems Command
NSWC
Naval Surface Warfare Center
INDIAN HEAD DIVISION

RESTORATION ADVISORY BOARD (RAB) MEETING

Date of Meeting: February 17, 2000

Restoration Advisory Board (RAB) Member Participants:

Mr. Elmer Biles (C)
Mr. Gary Davis (L)
Mr. Curtis DeTore (S)
Mr. Vincent Hungerford (C)*
Mr. Dennis Orenshaw (F)
Mr. Robert Sadorra (N)

RAB Members Not in Attendance:

Ms. Susan Adams (N)*
Mr. Stephen Elder (L)
Mr. Jason Groth (L)
Mr. Fred Pinkney (F)

Additional Attendees:

Ms. Linda Colton (C)
Ms. Sherry Deskins (N)
Ms. Sharon Geil (C)
Mr. Shawn Jorgensen (N)
Ms. Tara Landis (N)
Ms. Annette Ryburn (R)
Mr. Mark Yeaton (C,N)

* Co-Chair

C = Community
F = Federal Official
L = Local Official
N = Navy Official
R = Newspaper Reporter
S = State Official

ENCL (1)

Major Issues Discussed/Accomplished:

1. Meeting Introduction

Ms. Sherry Deskins of the Indian Head Division, Naval Surface Warfare Center (IHDIV-NSWC) began the meeting by welcoming everyone to the Indian Head Senior Center.

Ms. Deskins then presented the meeting agenda, which is included as Attachment A.

2. Installation Restoration (IR) Site 57 Remedial Investigation (RI) Report Update

Mr. Shawn Jorgensen of IHDIV-NSWC provided the status of the RI report for IR Site 57, Former Drum Disposal Area. Mr. Jorgensen provided a brief background of the site and a few of the highlights of the work completed to date at this site.

The results of the RI state that the excess lifetime cancer risk from this site is within the EPA target range (10^{-4} - 10^{-6}) for full-time workers and construction workers. However, the target range was exceeded for residential scenarios. This means that if the base were to close in the future and a home was built on this exact site (at Building 292), a potential cancer risk would exist for the residents of the house. The largest contributor to this potential risk is dichloroethylene (DCE), a breakdown product of trichloroethylene (TCE).

The RI also states that the hazard index at this site is less than one for full-time workers and greater than one for construction workers and residential scenarios. This means that for non-cancer-causing chemicals found at this site, a potential risk exists to construction workers that would be digging at this site and also for residents that would be living at the site, if the base were to close and a home built on the site. The largest contributor to this potential risk is arsenic.

In March 2000, a Feasibility Study (FS) will be conducted to evaluate alternatives to mitigate potential risk to construction workers due to arsenic in soil, and to mitigate high concentrations of TCE in soil and groundwater near the southern corner of Building 292. The anticipated completion date of the draft FS Report is April 2001.

As a final note, Mr. Jorgensen stated that $1,168,000 has been spent on IR Site 57 to date. This includes $350,000 for the recently awarded contract to prepare an FS.

A copy of Mr. Jorgensen's presentation is provided in Attachment B.

3. IR Site 47 Remedial Investigation (RI) Report Update

Mr. Robert Sadorra of the Engineering Field Activity Chesapeake provided the status of the RI Report for IR Site 47 (Mercuric Nitrate Disposal Area). Mr. Sadorra provided a brief background of the site and some of the findings from the RI fieldwork.

Carbon tetrachloride (CCl_4) and chloroform, a breakdown product of CCl_4, were found in two of the shallow groundwater monitoring wells (wells 3 and 4) at the site. Activity personnel confirmed that CCl_4 was used in Building 856 during the late 1970s and early 1980s. In addition, some heavy metals, such as mercury, silver, and lead, were found in soil and sediment at the site.

The risk assessments for this site are currently being developed. They will be included in the draft RI Report, which will be completed in April 2000.

A copy of Mr. Sadorra's presentation is included as Attachment C.

4. IR Sites 12, 41, and 42 Feasibility Study (FS) and Remedial Design Update

Mr. Robert Sadorra provided the status of the FS Report for IR Sites 12 (Town Gut Landfill), 41 (Scrap Yard), and 42 (Olsen Road Landfill). The fieldwork that was needed for the FS was completed on October 4, 1999. This fieldwork included digging test pits, delineating wetlands, sampling soil, and performing toxicity tests on sediment. The draft FS Report was completed February 14, 2000, and should be made available for public comment by April 2000.

In addition, Mr. Sadorra discussed the next steps in the process for these sites, which include the preparation of a Proposed Plan (PP), the Record of Decision (ROD), and the Remedial Design (RD). The PP will describe the remediation alternatives that will be considered and will support one preferred alternative. The ROD documents the final remedial response action decision and is signed by the Navy and the EPA, with concurrence from the Maryland Department of the Environment (MDE). The RD describes how the selected alternative will be implemented.

The contract for the PP, ROD and RD was awarded in January 2000 at cost of $543,000.

A copy of Mr. Sadorra's presentation is included in Attachment D.

5. Remedial Investigation (RI) Project Status for Sites 15, 16, 49, and 53

Mr. Sadorra discussed four sites on which RIs will be conducted in fiscal year (FY) 2000. These include: IR Site 15 - Mercury Deposits in Manhole, Fluorine Lab; IR Site 16 - Laboratory Chemical Disposal; IR Site 49 - Chemical Disposal Pit; and IR Site 53 - Mercury in the Sewage System.

A total of $278,754 has been awarded to prepare work plans and conduct the fieldwork for the RI. The draft work plans are expected to be completed in March 2000 with the fieldwork conducted in the summer of 2000.

A copy of Mr. Sadorra's presentation is included in Attachment E.

6. Mattawoman Creek Study Update

Mr. Sadorra discussed the progress of the Mattawoman Creek Study. The purpose of the study is to evaluate the effects of IR sites on the ecological and public health of Mattawoman Creek. This contract was awarded in January 2000 at a cost of $308,000 and includes preparing a work plan for the study and obtaining samples.

A copy of Mr. Sadorra's presentation is included in Attachment F.

7. Remedial Investigation (RI) Project Status for Sites 11, 13, 17, 21 and 25

Mr. Jorgensen discussed five sites on which RIs will be conducted in fiscal year (FY) 2000. These include: IR Site 11 - Caffee Road Landfill, IR Site 13 - Paint Solvents Disposal Ground, IR Site 17 - Disposed Metal Parts Along Shoreline, IR Site 21 - Bronson Road Landfill, and IR Site 25 - Hypo Discharges From X-ray Building No. 2.

The estimated cost for this study is $700,000. The contract is expected to be awarded in February 2000, with a draft work plan completed in May 2000, fieldwork conducted in late summer 2000, and the draft RI Report completed in early 2001.

A copy of Mr. Jorgensen's presentation is included in Attachment G.

8. Additional Information

Mr. Jorgensen announced the availability of EPA Fact Sheets containing information on the chemicals discussed during the

meeting. Copies of these fact sheets are included in Attachment H.

9. Comments, Questions, and Answers

Numerous comments were made and questions asked during the meeting. These comments, questions, and answers are provided in Attachment I.

9. Conclusion

Ms. Deskins concluded the meeting by thanking all in attendance and reminded everyone that the next meeting is scheduled for Thursday, June 15, 2000, from 7:00 to 9:00 p.m. at the Indian Head Senior Center.

Ms. Deskins then presented the tentative agenda for the next RAB meeting, which is included as Attachment J.

INDIAN HEAD DIVISION,
NAVAL SURFACE WARFARE CENTER
INSTALLATION RESTORATION PROGRAM
RESTORATION ADVISORY BOARD (RAB) MEETING
AGENDA

February 17, 2000

7:00 - 7:10	ARRIVAL/WELCOME Ms. Sherry L. Deskins Indian Head Division, Naval Surface Warfare Center Director, Waste Management and Prevention Division
7:10 - 7:25	IR SITE 57 REMEDIAL INVESTIGATION (RI) REPORT UPDATE Mr. Shawn Jorgensen Indian Head Division, Naval Surface Warfare Center IR Project Manager
7:25 – 7:40	IR SITE 47 RI REPORT UPDATE Mr. Robert Sadorra Engineering Field Activity Chesapeake Remedial Project Manager
7:40 – 7:55	IR SITES 12, 41, AND 42 FEASIBILITY STUDY AND REMEDIAL DESIGN UPDATE Mr. Robert Sadorra
7:55 - 8:15	RI FOR SITES 15, 16, 49, AND 53 Mr. Robert Sadorra
8:15 – 8:25	MATTAWOMAN CREEK STUDY UPDATE Mr. Robert Sadorra
8:25 - 8:40	RI FOR SITES 11, 13, 17, 21, 25 Mr. Shawn Jorgensen
8:40 - 9:00	COMMENTS, QUESTIONS, AND ANSWERS
9:00	ADJOURN

Attachment A

NAVAL SURFACE WARFARE CENTER
INDIAN HEAD DIVISION
RESTORATION ADVISORY BOARD

Remedial Investigation Report Status

Site 57 - Building 292, Trichloroethylene (TCE)

Shawn Jorgensen
IR Project Manager

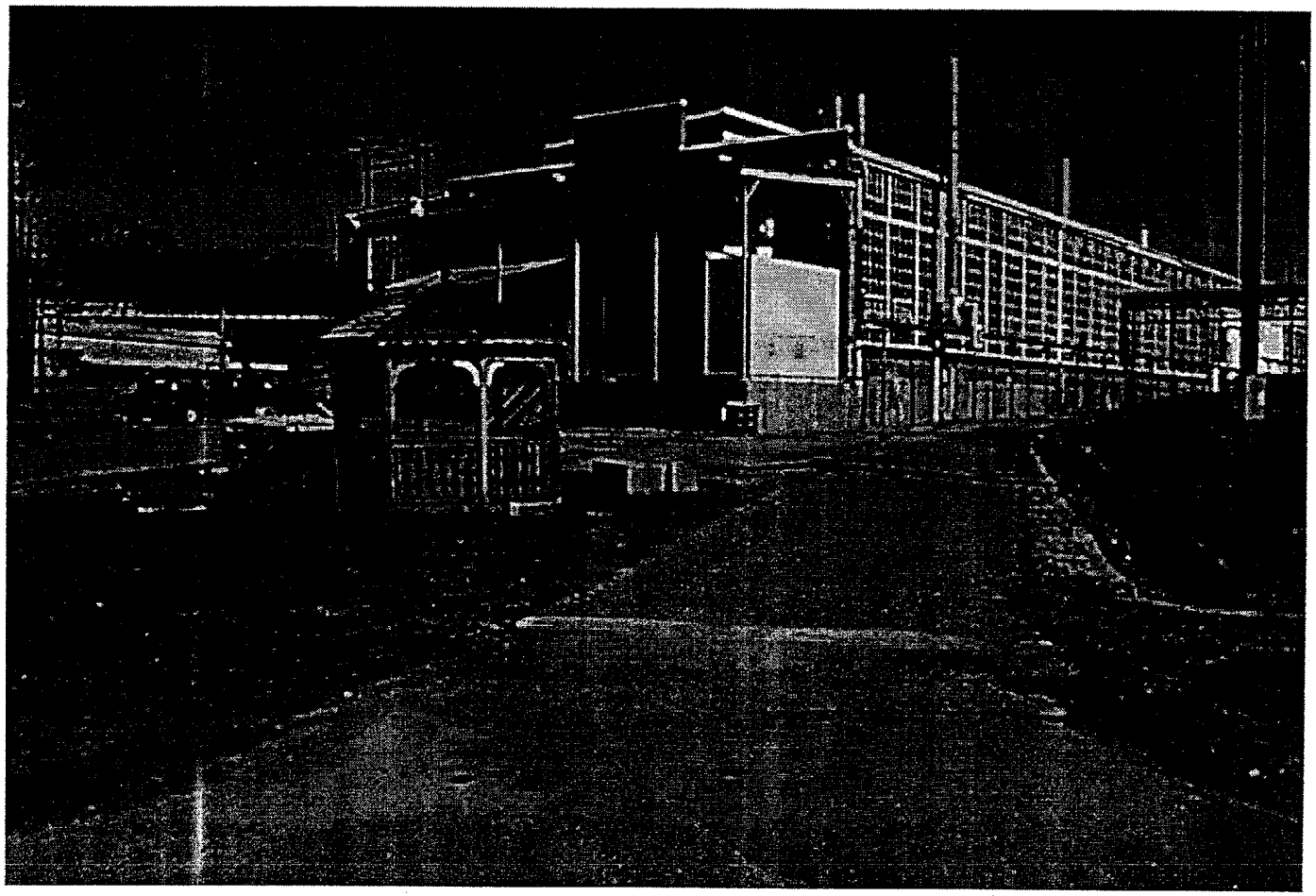
February 17, 2000

Attachment B

IR Site 57 Background

- *TCE discovered in IW-80*
- *Bldg. 292 used TCE for degreasing until 1989 and decanted TCE to drums located outside of the building near storm sewer manhole (MH-1)*
- *Sampling in MH-1 revealed TCE contamination while upstream manholes had no contamination*
- *Soil gas, soil, and groundwater sampling TCE in soil and groundwater*
- *Concern of TCE migration from groundwater infiltration into the storm sewer*

IR Site 57



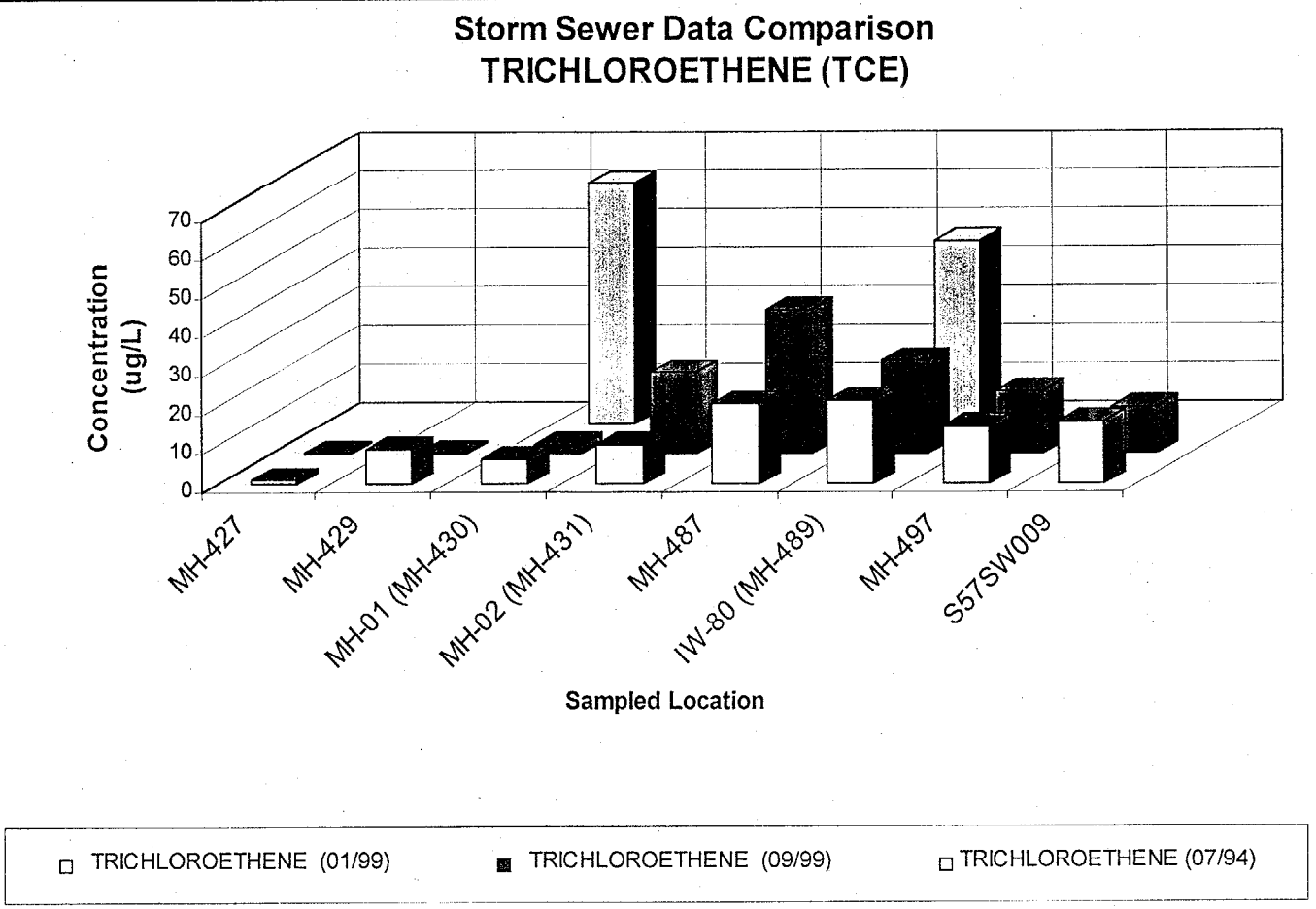
IR Site 57
Work Completed

- *September 1995 - Limited sampling of soil-gas, soil, and groundwater conducted*
- *October 1998 - Removal Action (pipe relining) completed*
- *October 1998 - Field work for Phase I of RI (soil data) completed*
- *January 1999 - Field work for Phase II of RI (groundwater, sediment, surface water) completed*
- *June 1999 - Draft RI Report - Data inconsistencies required resampling of relined pipe*

IR Site 57
Work Completed

- *September 1999 - Pipe resampled*
- *February 2000 - Draft Final RI Report Completed*
  - *Contains all data obtained during fieldwork*
  - *Contains Risk Assessment Information*

IR Site 57
Storm Sewer Data



IR Site 57 Risk Assessment

- *Human Health Risk*
  - *Excess lifetime cancer risk**
    - *Within EPA target range (10^{-4} - 10^{-6})*
      - *Full-time Worker*
      - *Construction Worker*
    - *Exceeded for residential scenarios only*

* Risk based on Dichloroethylene, a breakdown product of Trichloroethylene

IR Site 57 Risk Assessment

- *Human Health Risk (continued)*
  - *Hazard Index*
    - *Less than 1 (minimal to no risk)*
      - *Full-time worker*
    - *Greater than 1 (potential risk)**
      - *Construction Worker*
      - *Residential scenarios*

* Risk based on arsenic

IR Site 57
Future Schedule

- *March 2000 - Begin Feasibility Study (FS)*
  - *Evaluate alternatives to mitigate potential risk to construction workers due to arsenic in soil*
  - *Evaluate alternatives to mitigate high concentrations of TCE in soil and groundwater near southern corner of Building 292*
- *April 2001 - Draft FS Report*

IR Site 57 Budget

- *Dollars Spent to-date on IR Site 57 - $1,168,000*
  - *Initial Investigation (Soil-Gas, soil, water) - $106,000*
  - *Removal of Soil for Loading Dock - $125,000*
  - *EE/CA and Treatability Study - $127,000*
  - *Removal Action (Pipe-lining) - $240,000*
  - *Remedial Investigation - $220,000*
  - *Feasibility Study - $350,000*
    - *Scheduled to begin March 2000*

NAVAL SURFACE WARFARE CENTER
INDIAN HEAD DIVISION
RESTORATION ADVISORY BOARD

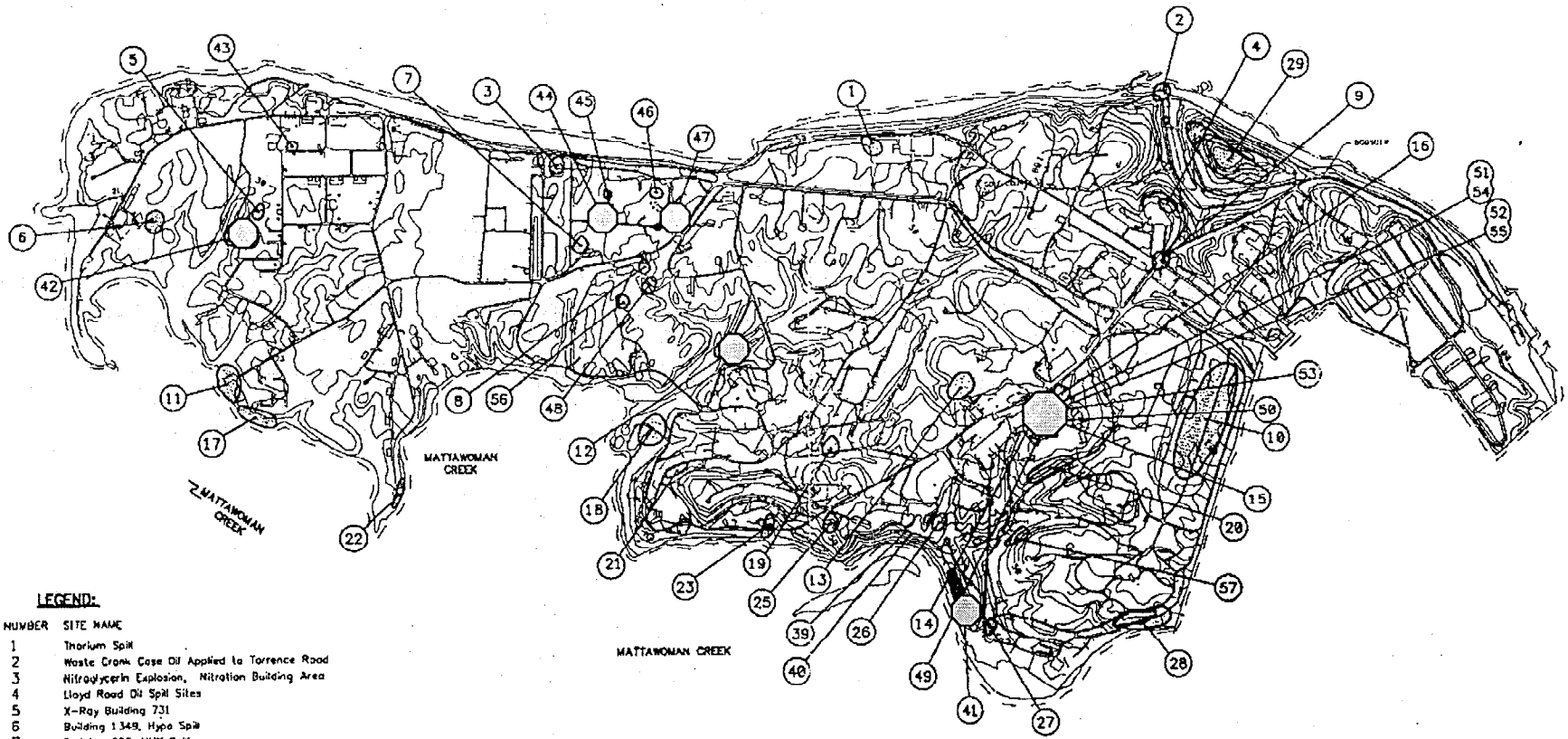
Remedial Investigation Project Status

Site 47 - Mercuric Nitrate Disposal Area

Robert Sadorra, RPM
Engineering Field Activity Chesapeake
February 17, 2000

Attachment C

NSWC Indian Head
IR Site Map



LEGEND:

SITE NUMBER	SITE NAME
1	Thorium Spill
2	Waste Crank Case Oil Applied to Torrence Road
3	Nitroglycerin Explosion, Nitration Building Area
4	Lloyd Road Oil Spill Sites
5	X-Ray Building 731
6	Building 1349, Hypo Spill
7	Building 682, HMX Spill
8	Building 766, Mercury Deposits
9	Patterson Avenue, Oil Spill
10	Single-base Propellant Grains Spill
11	Coffee Road Landfill
12	Town Gut Landfill
13	Paint Solvents Disposal Ground
14	Waste Acid Disposal Pit
15	Mercury Deposits in Manhole, Flourine Lab
16	Laboratory Chemical Disposal
17	Disposal Metal Parts Along Shoreline
18	Hog Island
19	Catch Basins at Chip Collection Houses
20	Single-base Powder Facilities
21	Bronson Road Landfill
22	NC Slums Burning Site
23	Hydraulic Oil Spill Discharges From Extrusion Plant
24	Abandoned Drain Lines
25	Hypo Discharge X-Ray Building No. 2
26	Thermal Destructor 2
27	Thermal Destructor 1
28	Original Burning Ground
29	The Valley
38-38	Stump Neck Annex (SEE FIGURE-3-2)
39	Organic Plant Outfall
40	Palladium Catalyst in Sediments
41	Scrap Yard
42	Olson Road Landfill
43	Toluene Disposal Site
44	Soak Out Area
45	Abandoned Drums
46	Cadmium Sandblast Grit
47	Mercuric Nitrate Disposal Area
48	Nitroglycerine Plant Discharge Area
49	Chemical Disposal Area
50	Building 103, Crawl Space
51	Building 101, Dry Wall
52	Building 102, Dry Wall
53	Mercury Contamination of the Sewage System
54	Building 101
55	Building 102
56	IW87 - Lead Contamination
57	TCE Building 292 Area

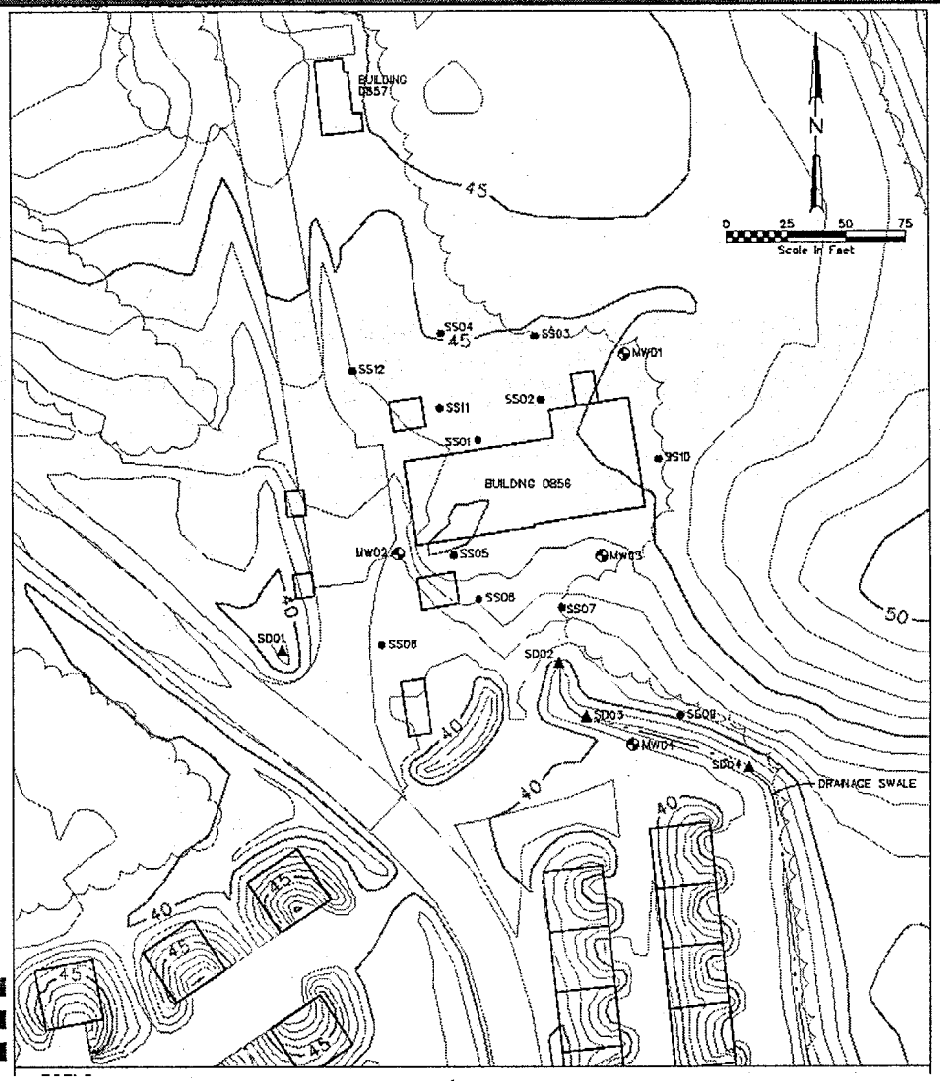
APPROXIMATE SITE LOCATION
INTERMITTENT STREAM
NAVAL RESERVE BOUNDARY
CONTOUR INTERVAL 10 FEET
FLOW DIRECTION

0 1600 3200
SCALE IN FEET

Site 47 - RI Project Status
Site Background

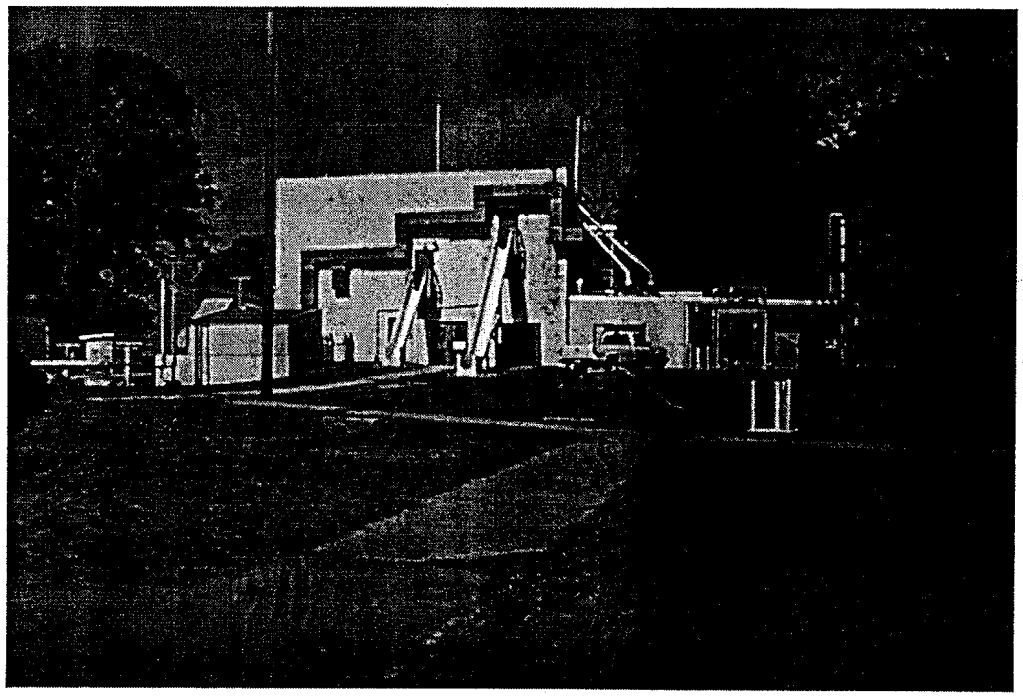
- ***Site 47 - Mercuric Nitrate Disposal Area***
  - *Mercuric Nitrate was disposed in area approximately 24 sq. ft.*
  - *Limestone chips used to neutralize spent nitric acid*
  - *Procedure carried out between 1957 and 1965*
  - *Initial sampling performed for Site Inspection (SI) in 1992 and 1993*
  - *Final SI Report (March 4, 1994) recommended further study*

Site 47 - RI Project Status
Site Background



Site 47 - RI Project Status Preliminary Findings

- *Shallow groundwater*
  - *Carbon Tetrachloride*
    - *MW 3 - 286 ppm*
    - *MW 4 - 6 ppm*
  - *Chloroform*
    - *MW 3 - 57 ppm*
    - *MW 4 - 6 ppm*
- *Soil*
  - *Some heavy metal, i.e. mercury, silver and lead*
- *Sediment*
  - *Some heavy metals*



Site 47 - RI Project Status
Site Schedule

- ***Site 47 - Mercuric Nitrate Disposal Area***
  - *Currently developing Risk Assessments*
  - *Draft RI report anticipated April 2000*

NAVAL SURFACE WARFARE CENTER
INDIAN HEAD DIVISION
RESTORATION ADVISORY BOARD

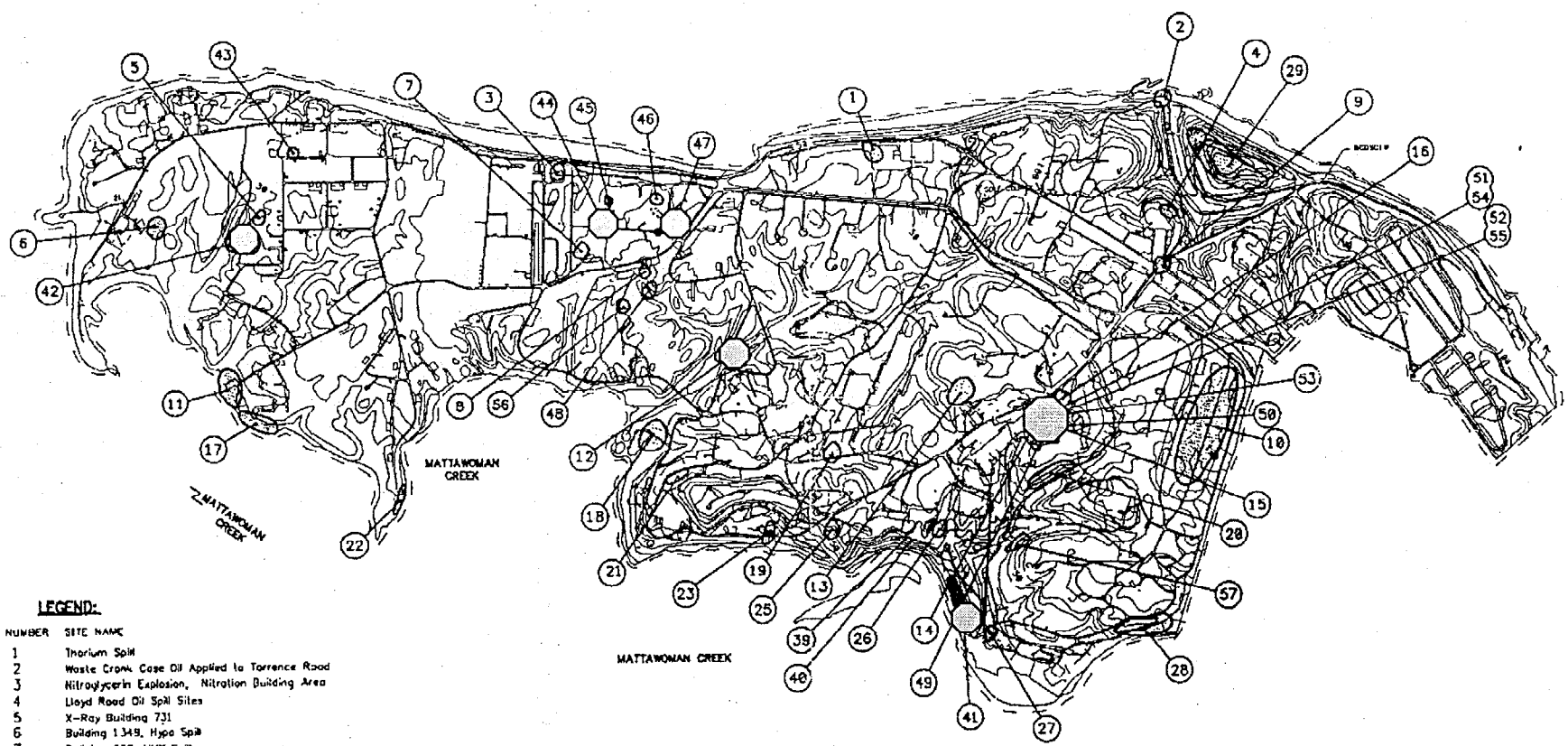
Project Status

Site 12 - Town Gut Landfill
Site 41 - Scrap Yard
Site 42 - Olsen Road Landfill

Robert Sadorra, RPM
Engineering Field Activity Chesapeake
February 17, 2000

Attachment D

NSWC Indian Head
IR Site Map



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10	Single-base Propellant Grains Spill
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13	Paint Solvents Disposal Ground
14	Waste Acid Disposal Pit
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18	Hog Island
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21	Bronson Road Landfill
22	NC Slums Burning Site
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24	Abandoned Drain Lines
25	Hypo Discharge X-Ray Building No. 2
26	Thermal Destructor 2
27	Thermal Destructor 1
28	Original Burning Ground
29	[illegible]
38-38	Stump Neck Annex (SEE FIGURE 3-2)
39	Organic Plant Outfall
40	Palladium Catalyst in Sediments
41	Scrap Yard
42	Olson Road Landfill
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CONTOUR INTERVAL 10 FEET
FLOW DIRECTION

0 1600 3200
SCALE IN FEET

Sites 12, 41, 42 - Project Status
Feasibility Study

Purpose

- *Describe, evaluate and compare alternatives*
- *Select Remedy*

Tasks

- *Alternative development*
- *Alternative evaluation and comparison*
  - *Overall protection of human health and the environment*
  - *Compliance with ARARs*
  - *Long-term effectiveness and permanence*
  - *Reduction of toxicity, mobility or volume through treatment*
  - *Short-term effectiveness*
  - *Implementability*
  - *Cost*
  - *State Acceptance*
  - *Community Acceptance*

Sites 12, 41, 42 - Project Status Feasibility Study

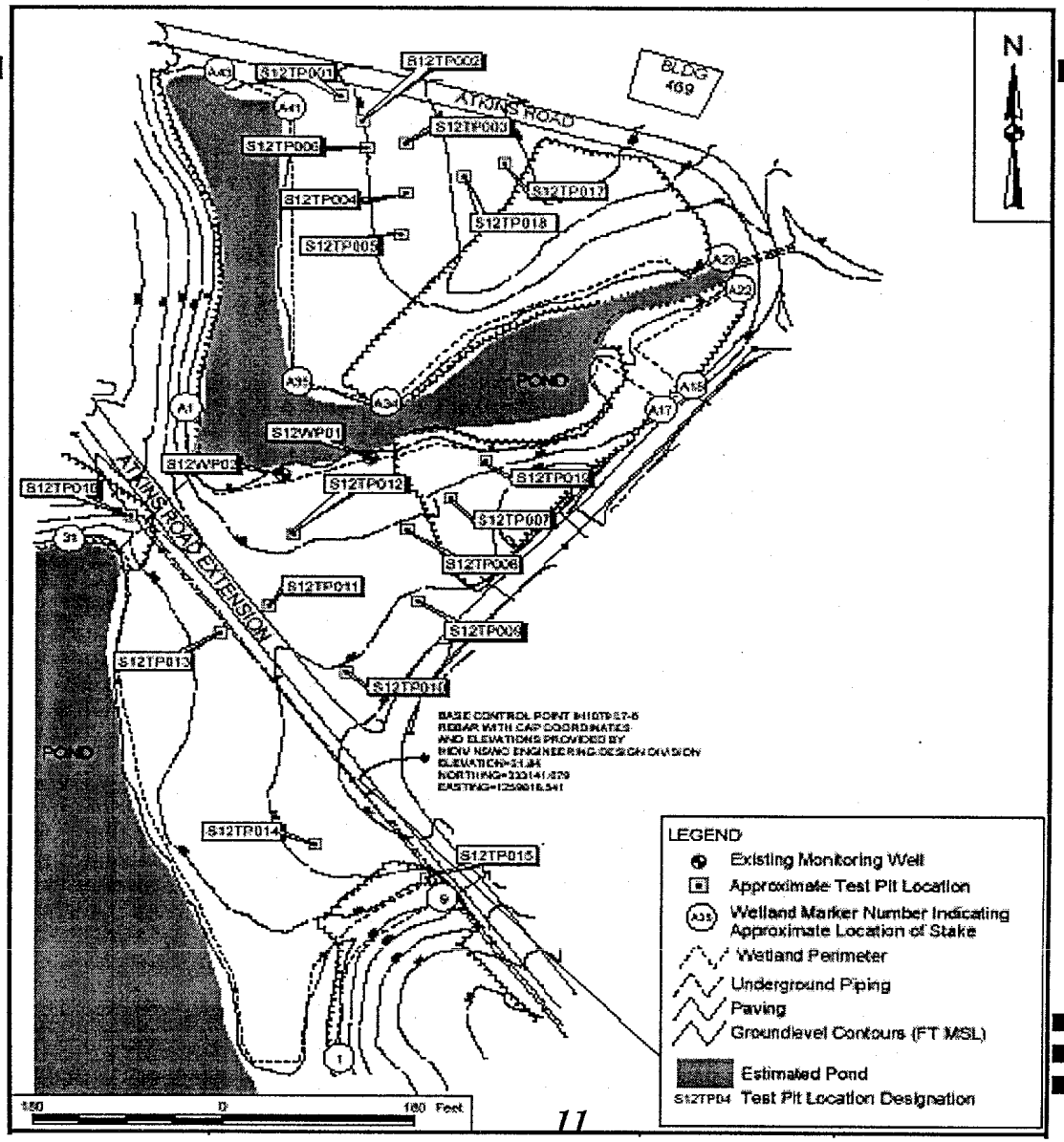
- *Feasibility Study Field Investigation Work Plan completed May 1999*
  - *Fill engineering data needs*
  - *Obtain data for cost estimation*
- *Field work completed October 4*
  - *Site 12 - Town Gut Landfill*

    Test Pits, Wetlands Delineation
  - *Site 41 - Scrap Yard*

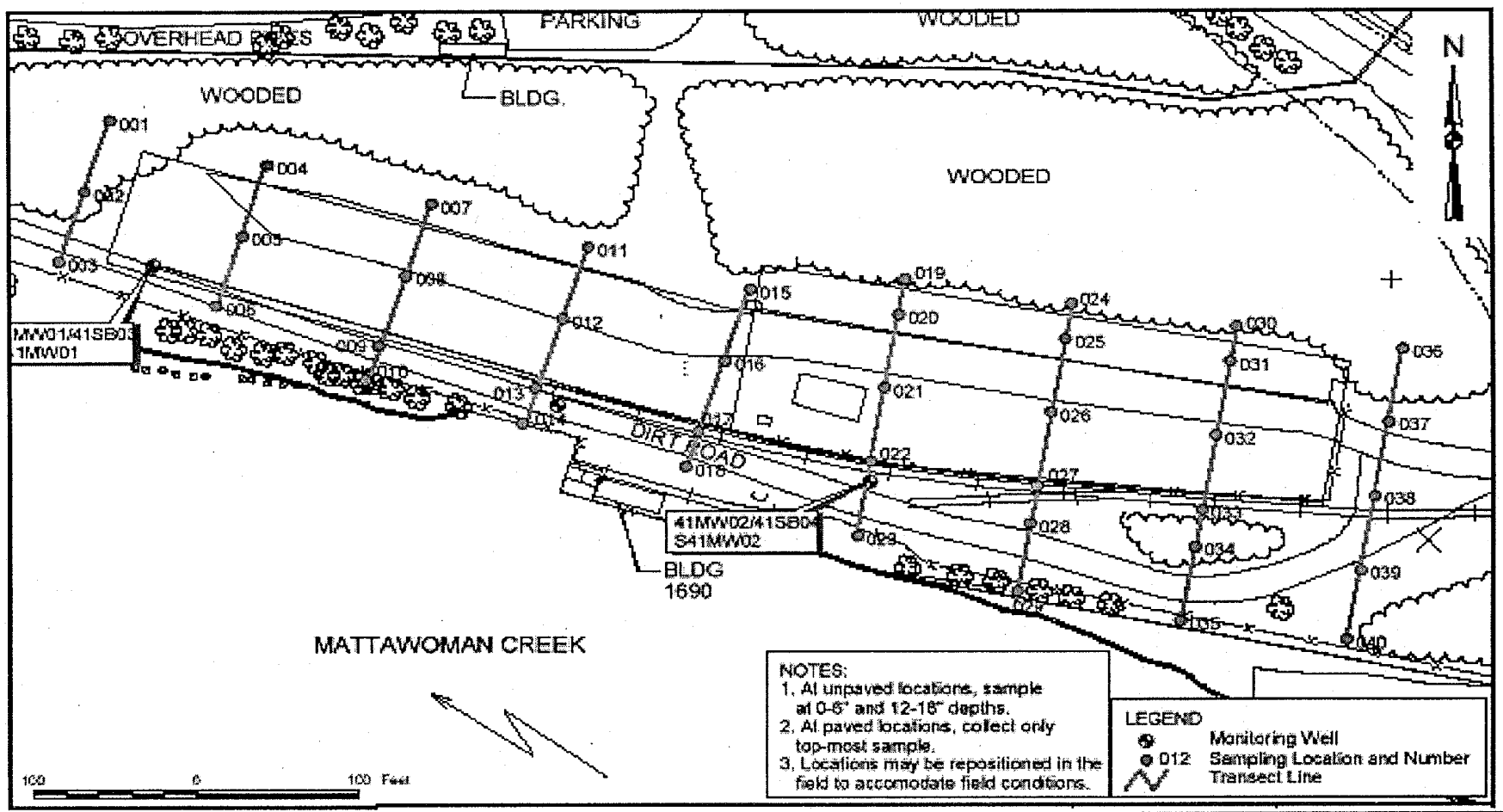
    Surface Soil Sampling
  - *Site 42 - Olsen Road*

    Test Pits, Sediment Sampling, Toxicity Tests, Wetlands Delineation

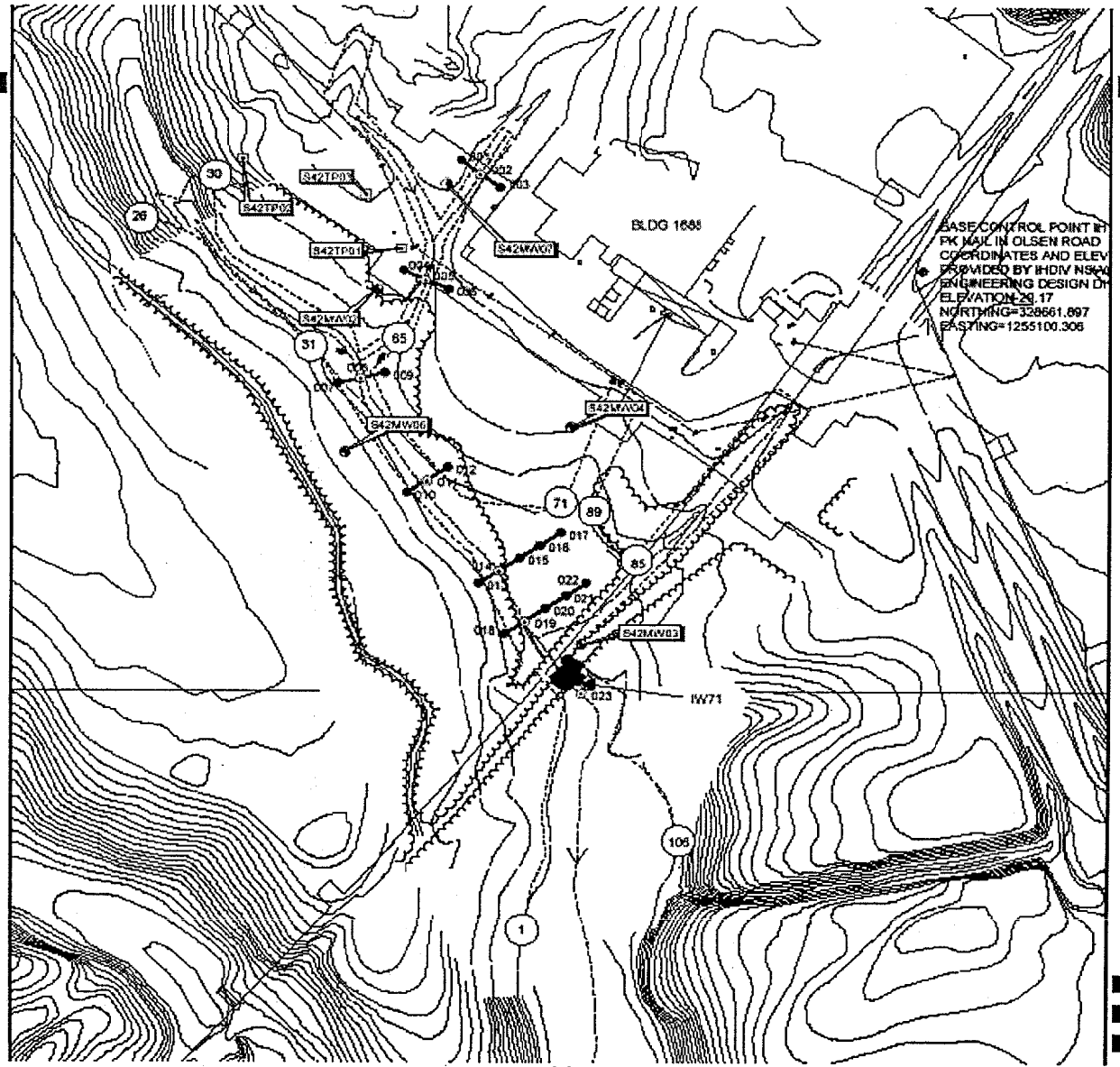
Feasibility Study Project Status
Site 12 - Town Gut Landfill



Feasibility Study Project Status
Site 41 - Scrap Yard



Feasibility Study Project Status
Site 42 - Olson Road Landfill



Sites 12, 41, 42 - Project Status Feasibility Study Schedule

- *Fieldwork completed October 4*
- *Draft report received February 14, 2000*
- *Should be made available for public comment by April 2000*

Sites 12, 41, 42, 44 - Project Status PP / ROD and Remedial Design

- *Proposed Plan (PP)*
  - *Briefly describes the remediation alternatives that were considered and summarizes the information relied upon to select the preferred alternative*
- *Record of Decision (ROD)*
  - *Documentation of a final remedial response action decision*
  - *Describes the remedy selection process and the remedy method selected*
  - *The document is signed by the Navy and the EPA, with concurrence from the MDE*
  - *Schedule*
    - *Awarded January 2000*
    - *Scheduled completion: approximately 14 months*

Sites 12, 41, 42, 44 - Project Status PP / ROD and Remedial Design

- *Remedial Design*
  - *To convert the conceptual design for the selected remedy into a final design that is implemented*
  - *Awarded January 2000 at a cost of $543,000*

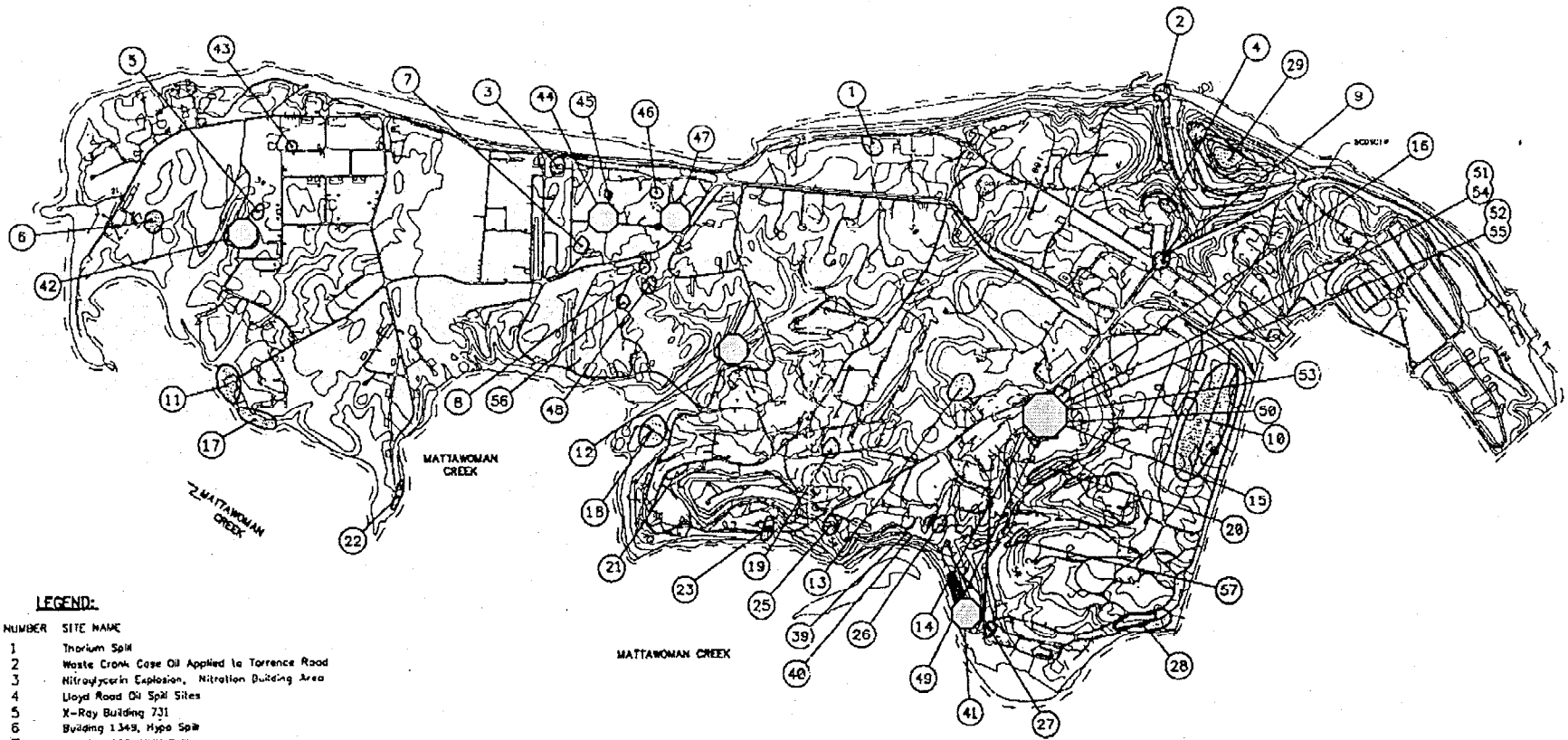
Remedial Investigation Project Status

Site 53 - Mercury in the Sewage System
Site 49 - Chemical Disposal Pit
Site 15 - Mercury Deposits in Manhole, Flourine Lab
Site 16 - Laboratory Chemical Disposal

Robert Sadorra, RPM
Engineering Field Activity Chesapeake
February 17, 2000

Attachment E

NSWC Indian Head
IR Site Map



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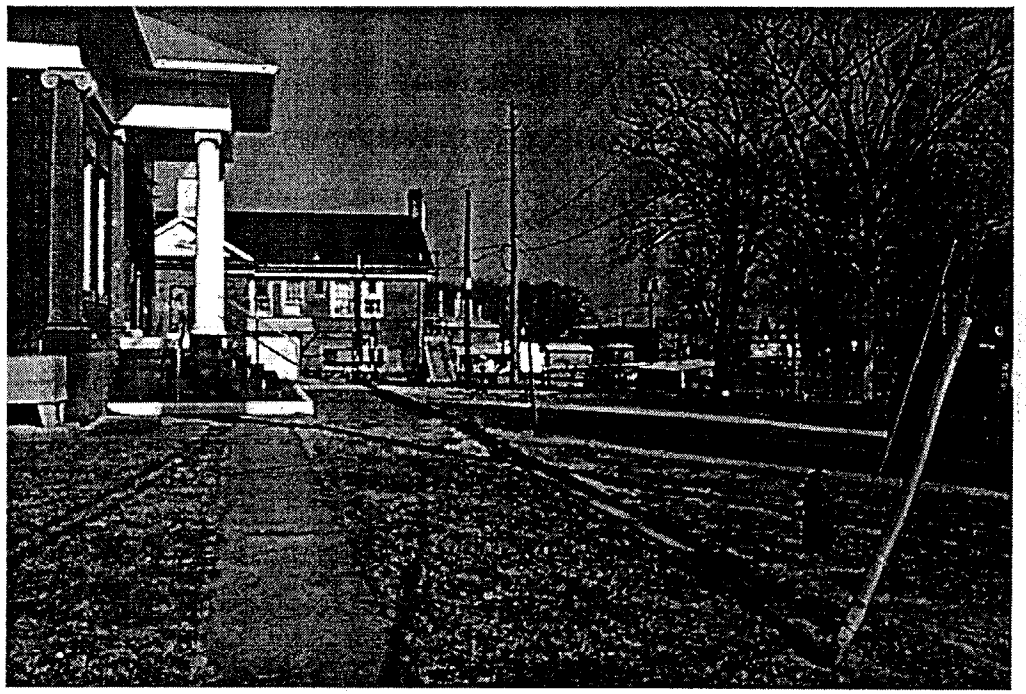
39	Organic Plant Outfall
40	Palladium Catalyst in Sediments
41	Scrap Yard
42	Olson Road Landfill
43	Tolueno Disposal Site
44	Soak Cut Area
45	Abandoned Drums
46	Cadmium Sandblast Grit
47	Mercuric Nitrate Disposal Area
48	Nitroglycerine Plant Dispoal Area
49	Chemical Disposal Area
50	Building 103, Crawl Space
51	Building 101, Dry Wall
52	Building 102, Dry Wall
53	Mercury Contamination of the Sewage System
54	Building 101
55	Building 102
56	IW67 - Lead Contamination
57	TCE Building 292 Area

APPROXIMATE SITE LOCATION
INTERMITTENT STREAM
NAVAL RESERVE BOUNDARY
CONTOUR INTERVAL 10 FEET
FLOW DIRECTION

0 1600 3200
SCALE IN FEET

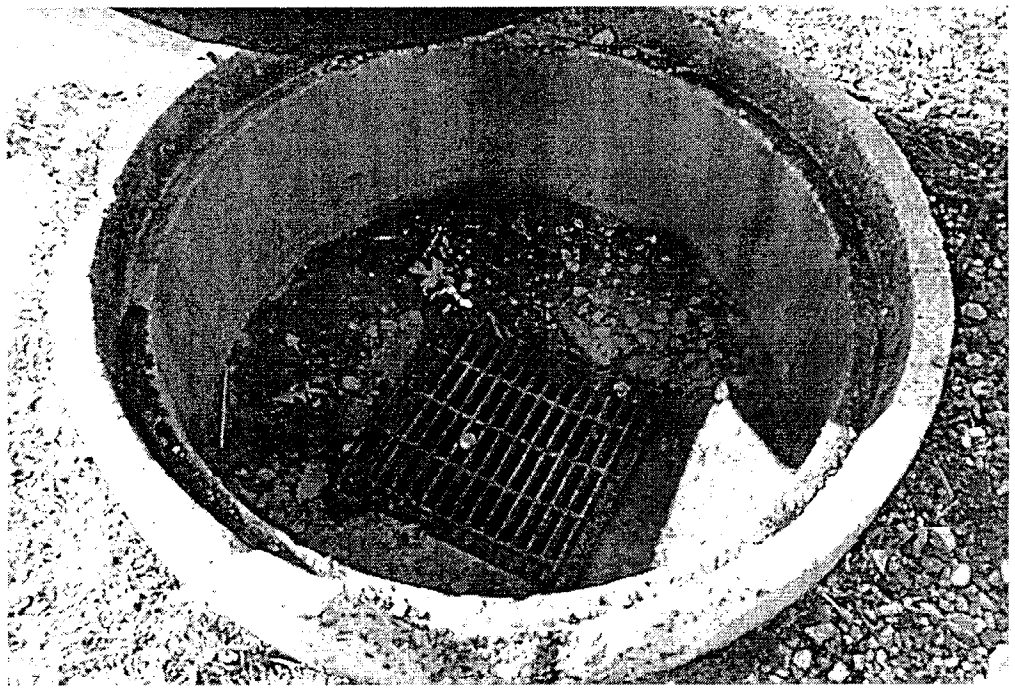
Sites 53,49,15,16 - Project Status
Site Background

- *Site 53 - Mercury in the Sewage System*
  - *1909 - 1986, mercury was reported lost in the sewage system in the general laboratory area in the northeastern part of the Activity*
  - *RI will be phased to include research of the layout, video taping of the sewers, sampling plan development, field work and reporting.*



Sites 53,49,15,16 - Project Status
Site Background

- *Site 49 - Chemical Disposal Pit*
  - *Located in the northeastern laboratory area*



  - *Circular concrete pit 2.5 feet in diameter and 3 feet deep*
  - *Pit was used to dispose of laboratory containers*
  - *Contents of the containers were collected in the bottom of the pit and drained from the pit*

Sites 53,49,15,16 - Project Status
Site Background

- *Site 15 - Mercury Deposits in Manhole, Fluorine Lab*
  - *Site 15 is the location of the Fluorine Laboratory (Building 502) and the Surveillance/Sample Control Building (Building 103), facilities constructed in 1942 and 1902, respectively.*
  - *Wastewater from both buildings was discharged through underground pipes, to a manhole approximately 100 feet from Building 502, and then to IW80.*
- *Site 16 - Laboratory Chemical Disposal*
  - *Site 16 consists of the wastewater collection system within the Research and Development Building (Building 600), constructed in 1944.*
  - *Waste chemicals were disposed of into the plumbing system where they combined with sanitary sewage and flowed to the NSWC sewage treatment plant.*

Sites 53,49,15,16 - Project Status
Site Schedule

- *Award: $ 139,918 in FY 99 and $ 138,836 in January 2000*
- *Schedule*
  - *Draft work plans due March 2000*
  - *Fieldwork in the summer*

NAVAL SURFACE WARFARE CENTER
INDIAN HEAD DIVISION
RESTORATION ADVISORY BOARD

Project Status

Mattawoman Creek Investigation

Robert Sadorra, RPM
Engineering Field Activity Chesapeake
February 17, 2000

Attachment F

Mattawoman Creek Investigation Project Status

- *Awarded January 2000 at $ 308,000*
- *Objective:*
  - *Evaluate the effects of IR sites and other potential sources of NSWC Indian Head on the ecological and public health of Mattawoman Creek.*

Mattawoman Creek Investigation
Project Status - Initial Steps

– *Development of Site Conceptual Model*

What past and present chemical constituent discharges due to NSWC Indian Head operations could adversely effect human health or ecological impact to various reaches of Mattawoman Creek?

- *Identify, acquire and interpret findings from past Indian Head operations, and identify known or likely chemical constituents associated with those operations.*
- *Identify, acquire, and interpret chemical constituent data from earlier sampling events at Indian Head for all media across the facility.*
- *Based on other information resources, capture the same data for other known or suspected chemical release sources such as wastewater treatment plants, agricultural activities, manufacturing plants likely to have chemical releases which could influence the human health and ecology of Mattawoman Creek.*
- *Identify, acquire, and interpret findings from data sources such as: the States of Maryland and Virginia DNR, USGS, US EPA Chesapeake Bay Field office, Virginia Institute of Marine Sciences, Smithsonian Institute, NOAA, Universities of Maryland and Virginia, and other similar resources.*

– *Work Plan Development*

NAVAL SURFACE WARFARE CENTER
INDIAN HEAD DIVISION
RESTORATION ADVISORY BOARD

Remedial Investigations - Project Status

Sites 11, 13, 17, 21, and 25

Shawn Jorgensen
IR Project Manager

February 17, 2000

Attachment G

Sites 11, 13, 17, 21, and 25 - Project Status
Sites To Be Studied

- *11 - Caffee Road Landfill*
- *13 - Paint Solvents Disposal Ground*
- *17 - Disposed Metal Parts Along Shoreline*
- *21 - Bronson Road Landfill*
- *25 - Hypo Discharges From X-ray Building No. 2*

Sites 11, 13, 17, 21, and 25 - Project Status
Site Background

- *Site 11 - Caffee Road Landfill*
  - *One to two acre area located at the end of Caffee Road on the shore of Mattawoman Creek*
  - *Contains various building debris, bulk metal items, and residue from open burning*

- *Site 13 - Paint Solvents Disposal Ground*
  - *Approximately 200 square-foot area located behind Building 870*
  - *Contains paint-related wastes - thinners, solvents, and used paint*
  - *Disposal took place from 1953 to 1979*
  - *Estimated 20,000 pounds of waste disposed (~2,000 gallons)*

Sites 11, 13, 17, 21, and 25 - Project Status
Site Background

- *Site 17 - Disposed Metal Parts Along Shoreline*
  - *1,000-foot stretch of shoreline along Mattawoman Creek located east of Caffee Road Landfill*
  - *Metal parts disposed from 1960 - 1980*

- *Site 25 - Hypo Discharges From X-Ray Building No. 2*
  - *Drainage swales located behind Building 588*
  - *Contains silver from spent fixer and developer used to process x-ray film*
  - *Discharged from 1944 - 1964*
  - *Estimated 864 pounds of silver discharged*

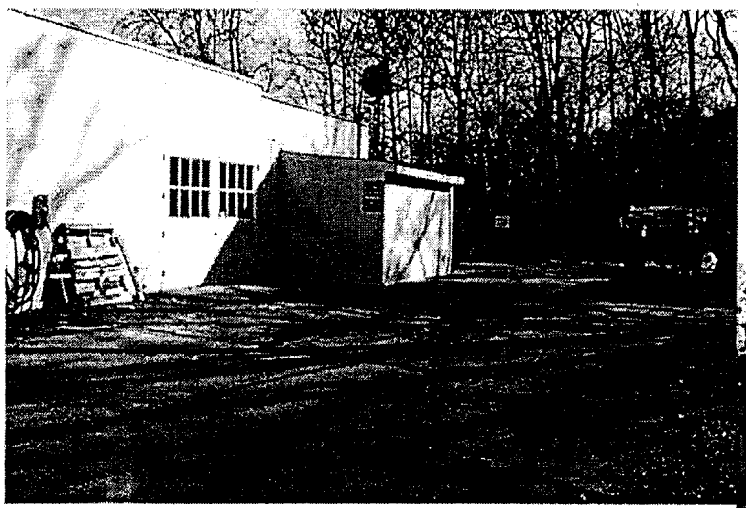
Sites 11, 13, 17, 21, and 25 - Project Status
Site Background

- *Site 21 - Bronson Road Landfill*
  - *2-acre "borrow pit" near Building 1384*
  - *Contains solid waste from various manufacturing processes*
  - *Disposal occurred from 1975 to 1982*
  - *Waste and estimated amounts include*
    - *Solid waste - 1,500 tons*
    - *Barium sludge - 2.5 tons*
    - *Asbestos - 3.3 tons*
    - *Paint sludge - 3 tons*

IR Site 11
Caffee Road Landfill

IR Site 13

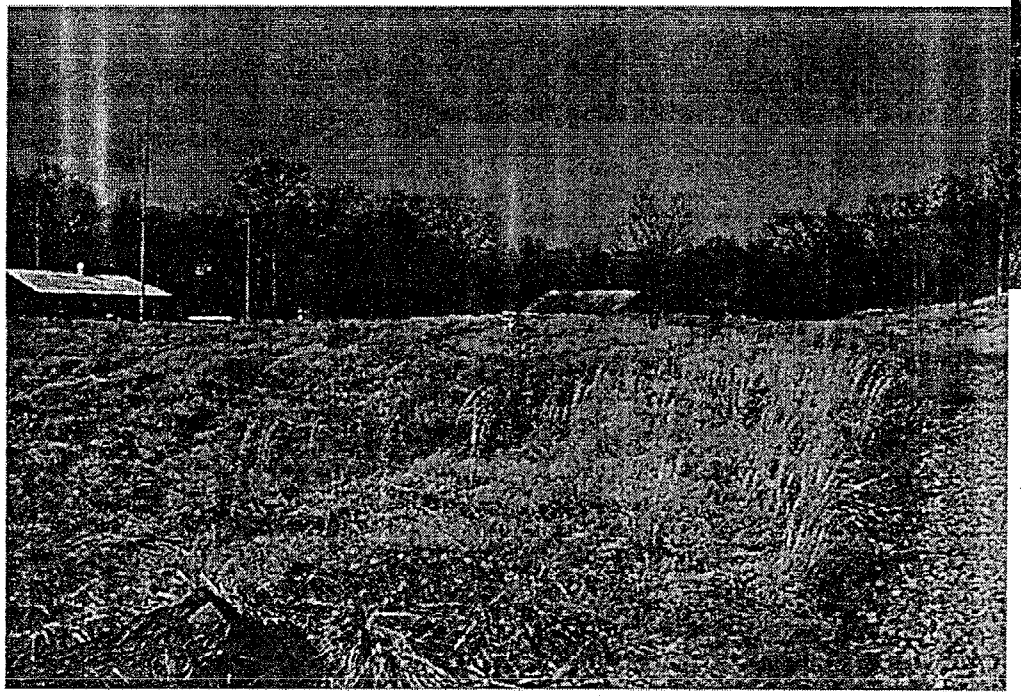
Paint Solvents Disposal Ground



IR Site 17

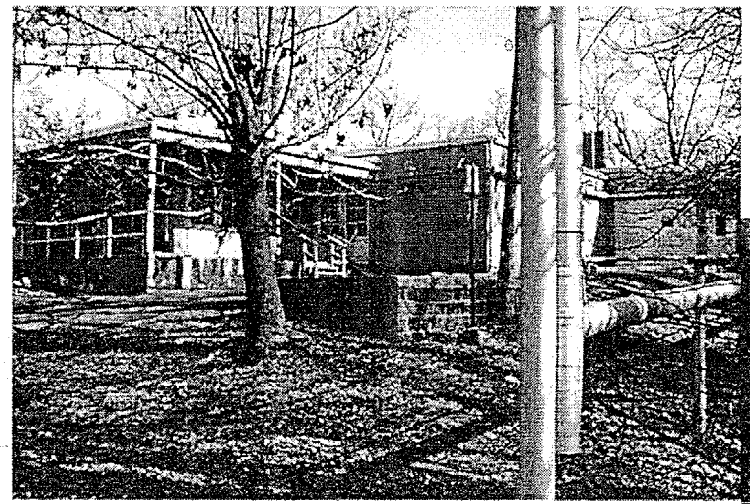
Disposed Metal Parts Along Shoreline

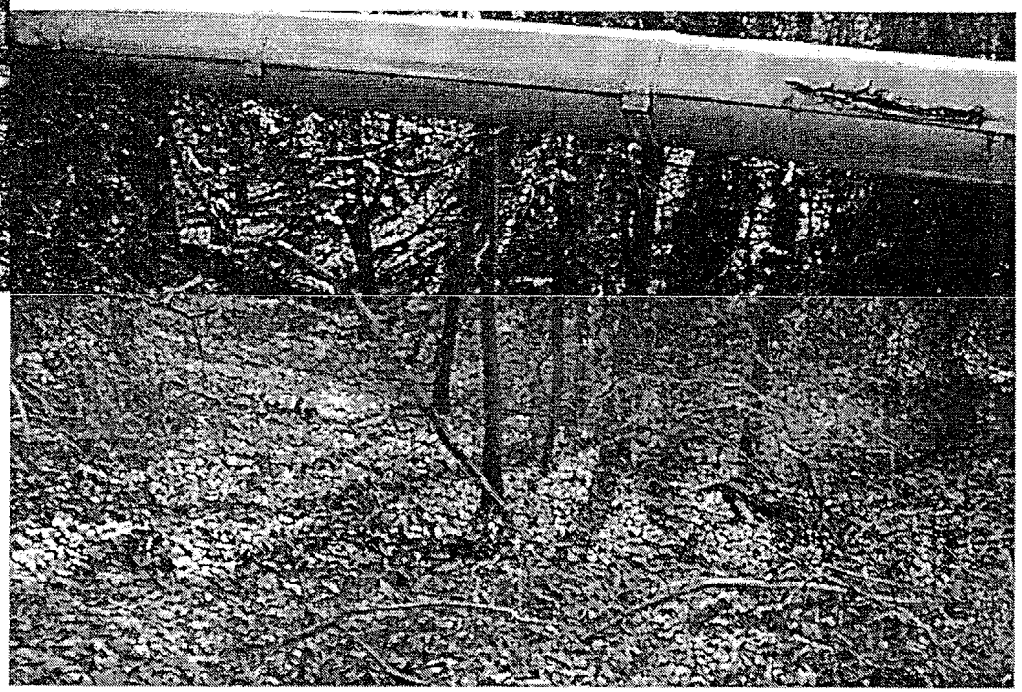
IR Site 21
Bronson Road Landfill



IR Site 25

Hypo Discharges From X-Ray Building No. 2





Sites 11, 13, 17, 21, and 25 - Project Status
Future Schedule

- *Remedial Investigation*
  - *Contract Award - February 2000*
    - *Draft Work Plan - April or May 2000*
    - *Field Work - Late Summer 2000*
    - *Draft RI Report - Early 2001*
  - *Cost for RI - $700,000*

Information Repositories

Indian Head Division
Naval Surface Warfare Center
Building 620 (Powder Keg)
101 Strauss Avenue
Indian Head, MD
20640-5035

Charles County Public Library
La Plata Branch
Charles & Garrett Streets
La Plata, MD 20646

EPA Facts About *Arsenic*

June 1992

What is arsenic?

Arsenic is a naturally occurring element. Pure arsenic is a gray-colored metal, but this form is not common. It is usually found in combination with one or more other elements such as oxygen, chlorine, and sulfur. Arsenic combined with these elements is referred to as inorganic arsenic, whereas arsenic combined with carbon and hydrogen is referred to as organic arsenic. Organic forms of arsenic are usually less *toxic* than the inorganic forms.

Arsenic is produced primarily as a by-product from the operation of nonferrous smelters, glass manufacturing, pesticide production and application, and burning of fossil fuels. Arsenic is also produced as a result of natural forces, that is, volcanos and weathering of arsenic-containing rocks. The major uses of arsenic are as wood preservatives and agricultural pesticides.

How might exposure to arsenic occur?

Arsenic is very widely distributed in the environment, and everyone is exposed to low levels. For most people, food constitutes the largest source of arsenic intake, with lower amounts coming from air and drinking water. Some edible fish and shellfish contain elevated levels of arsenic, but this is predominantly in an organic form known as "fish arsenic" that has a low toxicity. Above-average levels of exposure are usually associated with one or more of the following circumstances: (1) Natural mineral deposits containing large quantities of arsenic (may result in elevated inorganic arsenic levels in drinking water); (2) Chemical waste disposal sites, which contain large quantities of improperly-contained arsenic, (may allow the chemical to escape into the groundwater); (3) Elevated levels of arsenic in soil (may lead to exposure from ingesting soil); (4) Manufacturing (smelting) of copper and other metals (often releases inorganic arsenic into the air); (5) Burning of fossil fuels (results in low levels of inorganic arsenic emissions into the air); and (6) Widespread application of pesticides (may lead to water or soil contamination).

How does arsenic enter the body?

Arsenic enters the body principally through ingestion of food or water. Most ingested arsenic is quickly absorbed through the stomach and intestines and enters the blood stream. Arsenic which is inhaled (low levels of arsenic are present in cigarette smoke) is also well-absorbed into the blood stream through the lungs. Small amounts of arsenic may enter the body through the skin.

Most arsenic absorbed into the body is converted by the liver to a less-toxic form that is efficiently excreted in the urine. Consequently, arsenic does not have a strong tendency to accumulate in the body except at high exposure levels.

How can arsenic exposure affect human health?

Large doses of inorganic arsenic can be fatal. Lower levels of exposure may injure a number of different body tissues or systems, producing *systemic effects*. When taken orally, a common effect is irritation of the digestive tract, leading to pain, nausea, vomiting, and diarrhea. Other effects include decreased production of red and white blood cells, abnormal heart function, blood vessel damage, liver and/or kidney injury, and impaired nerve function causing a "pins and needles" feeling in the feet and hands.

Perhaps the systemic effect most characteristic of oral exposure to inorganic arsenic is a pattern of skin abnormalities including the appearance of dark and light spots on the skin, and small "corns" on the palms, soles, and trunk. Some of these corns may ultimately progress to skin cancer. Arsenic ingestion has also been reported to increase the risk of internal cancer, especially in the liver, bladder, kidneys, and lungs.

Inhalation exposure to inorganic arsenic dusts or fumes sometimes produces the same types of systemic health effects produced by oral exposure. However, this is not common, and the effects are usually mild. Of much greater concern is the ability of inhaled arsenic to increase the risk of lung cancer. Direct skin contact with arsenic compounds, frequently from inorganic arsenic dusts in air, may result in mild to severe irritation of the skin, eyes and throat.

Attachment H

Is there a medical test to identify arsenic exposure?

Measuring the levels of arsenic in urine is the best way to identify recent exposures. However, some common tests do not distinguish nontoxic forms such as fish arsenic from other forms. Consequently, a high concentration of arsenic in urine may not necessarily indicate a health problem. Measurement of arsenic in hair or fingernails is sometimes used to detect chronic exposures; however, this method is not very reliable for detecting low levels of arsenic exposure.

What levels of exposure have resulted in harmful health effects?

Generally, inorganic forms of arsenic are more toxic than organic forms, and forms that dissolve easily in water tend to be more toxic than those that dissolve poorly in water. Studies indicate considerable variation among different individuals, and it is difficult to identify with certainty the range of exposures which are of concern. The levels of arsenic that most people ingest in food or water are not usually considered to be a health concern. In fact, arsenic in trace amounts may be essential to good health.

For inhalation exposure, air concentrations of around 0.2 parts per billion (ppb) are associated with irritation to the nose, throat and exposed skin. The term "parts per billion" is a way of expressing the concentration of a contaminant in a liquid or air. One part per billion is equal to one inch in a distance of about sixteen thousand miles (or a penny in ten million dollars), a very small amount. Higher levels may occasionally lead to mild signs of systemic toxicity similar to that seen with oral exposure.

What currently happens to arsenic wastes?

The principal waste product of arsenic is slag, a by-product of ore smelting. Arsenic production is a dry operation (no water is used); only small quantities are discharged in wastewater. There is no recycling of arsenic from its principal use in wood preservatives and agricultural chemicals.

What recommendations has the federal government made to protect human health?

The U.S. Environmental Protection Agency (EPA) has established limits on the amount of arsenic released to the environment. EPA has also restricted or prohibited many of the uses of arsenic in pesticides and is considering further restrictions. EPA has established a *Maximum Contamination Level (MCL)* of 50 ppb for arsenic in drinking water.

GLOSSARY

Maximum Contaminant Level: EPA evaluates the health risks associated with various contaminant levels to ensure that public health is adequately protected. The MCL, as it is commonly known, is the maximum allowable concentration of a specific contaminant in public drinking water.

Systemic Effect: Impacts of contamination which affect the entire organism or bodily system.

Toxic: Acting as a poisonous or hazardous substance; having poisonous or harmful qualities.

For more information about Arsenic, please contact EPA at the following address:

U.S. Environmental Protection Agency
ATTN: Superfund Hotline
401 M Street, S.W.
Washington, D.C. 20460
1-800-424-9346 or 1-800-535-0202

The information contained in this fact sheet was compiled from the Toxicological Profile for Arsenic, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, in collaboration with the U.S. Environmental Protection Agency, March, 1989. *This fact sheet focuses on the impact of hazardous wastes on human health; however, EPA does evaluate these impacts on the environment, including plants and animals.*

EPA Facts About *Carbon Tetrachloride*

June 1992

What is carbon tetrachloride?

Carbon tetrachloride (CCl_4) is a clear, heavy liquid with a sweet odor. Because it evaporates very quickly, most CCl_4 that escapes into the environment is found in the air as a gas. Small amounts can also be found dissolved in water.

CCl_4 does not occur naturally. It is produced in large quantities to make refrigerants and propellants for aerosol cans. Since these products have been found to affect the earth's ozone layer, production of these chemicals is being phased out. Consequently, the manufacture and use of CCl_4 will also tend to decline.

In the past, CCl_4 was widely used as a cleaning fluid, both in industry, where it served as a degreasing agent, and in the household, where it was used to remove spots from clothing, furniture, and carpeting. Because CCl_4 does not burn, it was also used in fire extinguishers. These uses were discontinued in the mid-1960s. Until recently, CCl_4 was used to fumigate grain, but this was stopped in 1986.

CCl_4 is very stable and, therefore, remains in the environment. Although it is broken down by chemical reactions in air, this happens so slowly that it takes between 30 and 100 years for one-half of the original amount of CCl_4 to be destroyed.

How might exposure to carbon tetrachloride occur?

Past and present releases of CCl_4 have resulted in low levels of this compound being dispersed throughout the environment. In air, concentrations of 0.1 parts per billion (ppb) are common around the world, with somewhat higher values (0.2 to 0.6 ppb) in cities. The term "parts per billion" is a way of expressing the concentration of a contaminant in a liquid or air. One part per billion is equal to one inch in a distance of about sixteen thousand miles, or a penny in ten million dollars, a very small amount. CCl_4 is also found in some drinking water supplies, usually below 0.5 ppb. Exposure to levels of CCl_4 higher than these typical *background levels* may occur at industrial locations where CCl_4 is still used or near waste sites where releases into air, water, or soil are not properly controlled. Exposure from such sites could occur by breathing CCl_4 in air, by drinking water contaminated with CCl_4, or by getting contaminated soil on the skin. CCl_4 has been found in water or soil at about 7% of the waste sites investigated under *Superfund*, at concentrations from less than 50 to over 1,000 ppb.

How can carbon tetrachloride affect human health?

Exposure to high levels of CCl_4 can cause a number of harmful health effects, including death. The most immediate health effects usually involve the brain. Common effects are headaches and dizziness, along with nausea and vomiting. In severe cases, stupor or even coma may result. These effects usually disappear within a day or two following exposure, but permanent damage to nerve cells may occur in severe cases.

The liver is especially sensitive to CCl_4. In mild cases, the liver becomes swollen and tender, and fat tends to build up inside the tissue. In severe cases, many cells may be killed, leading to decreased liver function.

The kidneys are also sensitive to CCl_4, with the main effect being a decrease in urine formation. This can lead to accumulation of water in the body (especially in the lungs) and buildup of waste products in the blood. Kidney failure is often the main cause of death in people who die as a result of exposure to CCl_4.

Fortunately, if injuries to the liver and kidneys are not too severe, these effects disappear once exposure ceases. This is because both organs can repair damaged cells and replace dead tissue. Function is often nearly normal within a few days or weeks following exposure. CCl_4 also causes harm to other tissues in the body, but this is not usually as important as the effects on the liver, kidneys, and brain. Limited information from animal studies indicates that CCl_4 does not cause birth defects, but might decrease the survival rate of newborn animals. Most information on the health effects of CCl_4 in humans stems from cases in which individuals have been exposed only once or for a short period of time to relatively high levels of the chemical. Studies of the effects of long-term exposure to low levels of CCl_4 on humans have not been performed and the effects of such exposures are unknown.

Is there a medical test to identify carbon tetrachloride exposure?

Several very sensitive and specific tests can detect CCl_4 in exposed persons. The most convenient way is simply to measure CCl_4 in exhaled air; CCl_4 can also be measured in the blood, fat, or other tissues. Because special equipment is needed, these tests are not routinely performed in doctors' offices. Although these tests can identify exposure to CCl_4, the test results cannot yet be used to predict harmful health effects. Because CCl_4 is removed from the body fairly quickly, these methods are best suited to detection of exposures that have occurred within the past several days.

How can carbon tetrachloride enter and leave the body?

Carbon tetrachloride can enter the body through the lungs by breathing air containing CCl_4, or through the stomach by swallowing food or water containing CCl_4. Liquid CCl_4 can also pass through the skin into the body. Most CCl_4 is exhaled through the lungs within a few hours. Some CCl_4 in the body is temporarily absorbed by fat, and is then removed more slowly by the lungs.

What recommendations has the federal government made to protect human health?

The federal government has limited or banned the use of CCl_4 in most common household products and fire extinguishers, and has discontinued its use as a grain *fumigant*. The U.S. Environmental Protection Agency (EPA) has also set limits on the amount of CCl_4 released from an industrial plant into waste water, and is preparing to set limits on the amounts of CCl_4 released into outside air. One additional case of cancer may result in a group of 100,000 people exposed to CCl_4 in concentrations above 4 parts per billion in air or water over a period of 70 years.

What levels of exposure have resulted in harmful health effects?

Not all people are affected equally by exposure to CCl_4. Individuals who drink alcohol are usually much more susceptible than people who do not. Most serious or fatal cases of CCl_4 *toxicity* have involved people who have had several alcoholic drinks before or during exposure to CCl_4.

GLOSSARY

Background Levels: The concentration of any substance which would normally be found in an area. This level is used as a basis of comparison in identifying contamination levels.

Fumigant: Substance producing fumes used to disinfect or to destroy pests.

Superfund Program: The program operated under the legislative authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) that funds the EPA solid waste emergency and long-term removal and remedial activities.

Toxicity: The degree to which a substance acts as a poison.

For more information about Carbon Tetrachloride, please contact EPA at the following address:

U.S. Environmental Protection Agency
ATTN: Superfund Hotline
401 M Street, S.W.
Washington, D.C. 20460
1-800-424-9346 or 1-800-535-0202

The information contained in this fact sheet was compiled from the Toxicological Profile for Carbon Tetrachloride, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, in collaboration with the U.S. Environmental Protection Agency, December 1989. *This fact sheet focuses on the impact of hazardous wastes on human health; however, EPA does evaluate these impacts on the environment, including plants and animals.*

EPA Facts About *Chloroform*

June 1992

What is chloroform?

Chloroform is a colorless liquid with a pleasant odor. It is both a naturally-occurring and a man-made compound, or combination, of several chemicals. Most of the chloroform manufactured in the United States (93%) is used to make fluorocarbon-22, which is used in the production of fluoropolymers and as a cooling fluid in air conditioners. It is also used in the manufacture of pesticides and dyes, and in such products as fire extinguishers, dry cleaning spot removers, and various solvents.

How might exposure to chloroform occur?

Chloroform released to soil will either vaporize rapidly from the surface or *leach* readily through the soil, eventually entering groundwater. It is believed to persist for relatively long periods of time in groundwater. Exposure to chloroform can result from breathing air or ingesting drinking water, beverages, or foods contaminated with chloroform. Exposure may also occur during skin contact with various consumer products containing this compound or from exposure to chlorinated waters, for example, bath water and swimming pool water.

The primary sources of chloroform release to the environment are pulp and paper mills, drug and chemical manufacturing plants, chlorinated wastewater from sewage treatment plants, and chlorinated drinking water. Pulp and paper mills emit more chloroform to the environment than any other single source. Most of the chloroform released to the environment eventually enters the atmosphere. Once in the atmosphere, chloroform may be transported long distances before ultimately being degraded by *photochemical reaction*. Much smaller amounts enter groundwater as the result of filtration through the soil. Chloroform leaches into groundwater primarily from spills, landfills, and industrial sources. Chloroform in soil may come from improper land disposal of waste materials containing chloroform or other chlorine-containing compounds that are broken down to form chloroform.

How does chloroform enter the body?

Chloroform can enter the body by breathing air, eating food, or drinking water that contains chloroform. Chloroform readily penetrates the skin, therefore, chloroform may also enter the body by bathing in water containing chloroform. Foods such as dairy products, seafood, meat, vegetables, bread, and beverages may contain small, but measurable, amounts of chloroform. Drinking-water supplies containing organic contaminants may contain chloroform as a by-product of chlorination of the water supply for disinfection purposes.

Is there a medical test to identify chloroform exposure?

Chloroform can be detected in blood, urine, and body tissues; however, because chloroform is rapidly eliminated from the body, these methods are not very reliable. In addition, the presence of chloroform may have resulted from the biological breakdown of other chlorine compounds. An elevated level of chloroform may reflect exposure to these other compounds.

How can chloroform affect human health?

Chloroform affects the central nervous system, liver, and kidneys. It was once used as a surgical anesthetic before its harmful effects on the liver and kidneys were recognized. Short-term exposure to high concentrations of chloroform in the air causes tiredness, dizziness, and headaches. Longer-term exposure to high levels of chloroform can affect liver and kidney function. Toxic effects may include jaundice and burning urination. High doses of chloroform have also been found to cause liver and kidney cancer in experimental animals. The risks of cancer, if any, from low-level exposures to chloroform in drinking water as a result of chlorination, however, are far outweighed by the benefits of chlorination in terms of the greatly decreased incidence of *waterborne diseases*.

What levels of exposure have resulted in harmful health effects?

Based on available data for animals, the U.S. Environmental Protection Agency (EPA) has estimated that exposure to 1 part per billion (ppb) chloroform in air may result in 2.3 additional cases of cancer in a population of 100,000 people exposed over a period of 70 years. Exposure to drinking water containing 10 ppb chloroform may result in 17 additional cases of cancer in a population of 100,000 people exposed over a period of 70 years. The term "parts per billion" is a way of expressing the concentration of a contaminant in a liquid or air. One part per billion is equal to one inch in a distance of about sixteen thousand miles (or a penny in ten million dollars), a very small amount.

What recommendations has the federal government made to protect human health?

EPA sets rules for the amount of chloroform allowed in water. EPA has established a drinking water *Maximum Contaminant Level (MCL)* for total trihalomethanes, a group of chemicals which includes chloroform, of 0.1 ppm as a technically and economically feasible level for municipal water supplies which serve 10,000 people or more. In addition, the Agency requires that chloroform spills of 10 pounds or more be reported to the National Response Center.

What are the methods of treatment and disposal of chloroform?

EPA requires that individuals who generate, transport, treat, store, or dispose of this compound comply with the regulations of the Resource Conservation and Recovery Act. One method used to dispose of chloroform involves *sedimentation* followed by filtration and *adsorption* onto activated carbon. Chloroform can be disposed of by incineration, preferably after it is mixed with another combustible fuel.

GLOSSARY

Adsorption: A treatment method which uses activated carbon to remove organic matter from wastewater.

Leach: To pass through the soil due to rain or groundwater moving through contaminated materials. The process by which substances are released from the soil by dissolving in fluids, usually rain and surface water, and are carried down through the soil. Leaching can cause hazardous substances to enter the soil, surface water, or groundwater.

Maximum Contaminant Level (MCL): EPA evaluates the health risks associated with various contaminant levels to ensure that public health is adequately protected. The MCL, as it is commonly known, is the maximum allowable concentration of a specific contaminant in public drinking water.

Photochemical Reaction: A chemical change caused by the action of light on a substance.

Sedimentation: The settling of solids out of wastewater by gravity during wastewater treatment.

Waterborne Diseases: Diseases caused by organisms spread in water; for example, amoebic dysentery and cholera.

For more information regarding Chloroform, please contact EPA at the address shown below:

U.S. Environmental Protection Agency
ATTN: Superfund Hotline
401 M Street, S.W.
Washington, D.C. 20460
1-800-424-9346 or 1-800-535-0202

The information contained in this fact sheet was compiled from the Toxicological Profile for Chloroform, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, in collaboration with the U.S. Environmental Protection Agency, January, 1989. *This fact sheet focuses on the impact of hazardous wastes on human health; however, EPA does evaluate these impacts on the environment, including plants and animals.*

EPA Facts About
1,1 Dichloroethene

June 1992

What is 1,1-dichloroethene (DCE)?

Dichloroethene (DCE), a man-made chemical also known as vinylidene chloride, is used to make certain plastic wraps and flame-retardant fabrics. It is a clear, colorless liquid that evaporates quickly at room temperature and has a mild, sweet smell.

DCE is also found as a by-product of other chemicals. Although high amounts of DCE in soil and water will quickly escape into the air, small amounts will remain and are broken down. How long it will remain in soil and water is unknown. DCE breaks down quickly in the air; releases into the atmosphere are estimated to be degraded by the sun in about two days.

How might exposure to DCE occur?

DCE may be released into the environment in the air and water coming from factories where it is made, at hazardous waste sites where it has been dumped, and from accidental spills.

In addition to these high exposures, low-level exposures may occur in the environment. DCE is found in very low amounts in indoor and outdoor air, estimated at less than one part per trillion (ppt). The term "parts per trillion" is a way of expressing the concentration of a contaminant in a liquid or air. One part per trillion is equal to one inch in a distance of about sixteen million miles (or a penny in ten billion dollars), a very small amount. Therefore, the potential for exposure in the environment is extremely low.

The amount of DCE in the air near production sources is unknown. In air around waste sites, DCE amounts range from 0.39 to 36.4 parts per billion (ppb). Levels of DCE in air around waste sites are usually much lower than those that affect the health of laboratory animals. DCE was found at approximately 16% of all hazardous waste sites tested by the U.S. Environmental Protection Agency (EPA) and is found at approximately 432 of the 1,300 *National Priorities List (NPL)* hazardous waste sites.

A small percentage (3%) of the drinking water sources in the U.S. have been found to contain low amounts of DCE (0.2-0.5 ppb). These amounts are very low when compared with levels expected to affect human health. Levels in groundwater samples taken from hazardous waste sites where DCE was found averaged 1.38 parts per million (ppm).

How can DCE enter and leave the body?

DCE can easily enter the body through the lungs as an air pollutant or through the digestive tract in contaminated food or water. DCE probably also enters the body through the skin. This assumption is based on (1) its physical and chemical properties, (2) the fact that similar chemicals are known to be absorbed through the skin, and (3) the occurrence of *toxic* effects in animals after DCE was applied to their skin. The most common means of DCE exposure is breathing contaminated air.

Research on animals indicates that within hours of exposure, DCE begins to leave the body through the lungs. DCE remaining in the body is broken down into other substances and removed through the kidneys within two days. Low to moderate levels inhaled or ingested leave the body mainly as *breakdown products* in the urine. As the levels of DCE exposure increase, more and more leaves the body in exhaled breath. DCE is not stored in the body following moderate exposure.

How can DCE affect human health?

The health effects of DCE on humans are unknown. In animal studies, high amounts of DCE have caused liver, kidney, heart, and lung damage; nervous system disorders; and death after short exposures. Liver damage has also been seen in cases of prolonged exposure. The amount of damage depends on the level of exposure and the length of time exposed. Exposure by breathing DCE appears to be more harmful to animals than through food or water.

Harmful effects on the developing fetus of pregnant animals which had inhaled this chemical have been seen. An increased risk of cancer has been shown in animals exposed to DCE. EPA considers it to be a possible cancer-causing substance in humans.

Is there a medical test to identify DCE exposure?

DCE can be measured in the breath, blood, urine, and body tissues of exposed individuals. However, only relatively high levels of DCE can be detected in body tissues and fluids using currently available techniques. Because breath samples are easily collected, tests of exhaled air are now the most common way to identify exposure to high levels of DCE. Other medical tests can measure breakdown products of the chemical in the blood and urine. Because DCE leaves the body fairly quickly, these methods are best for identifying recent exposures. Measured levels in the body may not reflect exposure to DCE alone, since exposure to DCE at hazardous waste sites is likely to include exposure to other organic compounds that produce similar breakdown products.

What levels of exposure have resulted in harmful health effects?

Except for loss of breath, fainting, and nervous system disorders like drunkenness that result from exposure to high amounts of DCE in a closed space, there are few medical reports which document ill health effects.

Animal studies indicate that the normal actions of the liver, kidney, lungs, heart, and blood can be affected by DCE exposure. Harmful effects begin to occur at levels of 15 ppm following 5 days of exposure. Animals exposed to DCE levels of 98 ppm for 7 days have died. Animals which had very large amounts of DCE placed in their stomachs developed liver disease; some died. Those fed small amounts in drinking water over a period of months to years also developed liver disease.

What recommendations has the federal government made to protect human health?

Current EPA requirements limit DCE in drinking water to 7 ppm and mandate the reporting of all releases exceeding 5,000 pounds. Work is now underway by EPA to measure the levels of DCE at abandoned waste sites.

The Food and Drug Administration (FDA) regulates the use of plastic packaging films. The FDA does not consider the low levels of DCE found in foods wrapped in these films to be a health risk to the consumer.

What are the methods of treatment and disposal of DCE?

DCE is classified as a flammable liquid hazardous waste. Current disposal regulations require that DCE be dissolved in combustible solvents and scatter-sprayed into a furnace equipped with an afterburner and alkaline scrubber. Significant revision of the criteria for land treatment and burial is underway.

GLOSSARY

Breakdown Products: Most contaminants are combinations of specific substances. Contaminants are degraded, or separated, into these individual substances through chemical or physical means.

National Priorities List (NPL): EPA's list of uncontrolled or abandoned hazardous waste sites identified for possible long-term clean-up under the Superfund Program.

Toxic: Acting as a poisonous or hazardous substance; having poisonous or harmful qualities.

For more information about DCE, please contact EPA at the following address:

U.S. Environmental Protection Agency
ATTN: Superfund Hotline
401 M Street, S.W.
Washington, D.C. 20460
1-800-424-9346 or 1-800-535-0202

The information contained in this fact sheet was compiled from the Toxicological Profile for Dichloroethene, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, in collaboration with the U.S. Environmental Protection Agency, December, 1989. *This fact sheet focuses on the impact of hazardous wastes on human health; however, EPA does evaluate these impacts on the environment, including plants and animals.*

EPA Facts About *Mercury*

June 1992

What is mercury?

Mercury is a naturally occurring *element* found in several forms. One form, used in thermometers, is called "metallic mercury". Mercury is also used in barometers, and in other common consumer products. Mercury can combine with other chemicals such as chlorine, carbon, or oxygen to form either *"inorganic"* or *"organic"* mercury compounds. Mercury is unusual in that one form of organic mercury, called methylmercury, can accumulate in certain fish. As a result, rather low levels of mercury in bodies of water can significantly contaminate these fish.

Mercury released into the environment will persist for a long time. It can change between organic and inorganic forms. For example, some or all released organic mercury will slowly break down to become inorganic mercury. Some released inorganic mercury will also slowly be changed into organic mercury (specifically, methylmercury) in soil and water by reaction with substances produced by *microorganisms* and various chemical processes.

How might exposure to mercury occur?

Air usually contains mercury in concentrations of approximately 2.4 parts per trillion (ppt). The term "parts per trillion" is a way of expressing the concentration of a contaminant in a liquid or air. One part per trillion is equal to one inch in a distance of about sixteen million miles (or a penny in ten billion dollars), a very small amount. Levels near certain industries (such as mercury mines and refineries) can be nearly 1,800 ppt. Mercury levels in water samples taken from *Superfund* sites (including both *National Priorities List* (NPL) and non-NPL sites) were about 200 ppt. Levels greater than 500 ppt have been found in some drinking water wells tested during *groundwater* surveys.

People who eat large amounts of fish, such as tuna and swordfish, may be exposed to high levels of mercury because these fish can contain high levels of organic mercury. Environmental exposure can result from contact with water and air near spills and *toxic* waste sites contaminated with mercury. Mercury is found at above normal *background levels* at approximately 568 of 1,300 NPL sites.

How can mercury enter the body?

Mercury can easily enter the body if its *vapor* is inhaled or if fish or other foods contaminated with mercury are ingested. Mercury may also enter the body directly through the skin. Exposure to above-normal levels of mercury at NPL sites may result from drinking water contaminated with inorganic mercury salts. Some sites may have such high amounts of mercury in the soil or in containers, that breathing mercury metallic vapor may be a problem. Once mercury has entered the body, it may be months before all of it leaves. It is largely eliminated from the body in wastes.

Is there a medical test to identify mercury exposure?

There are reliable, accurate, and easily available ways to measure mercury levels in the body. Blood or urine samples can be taken in a doctor's office and tested in a laboratory using special equipment.

How can mercury affect human health?

Long-term exposure to either organic or inorganic mercury can permanently damage the brain, kidneys, and developing fetuses. The form of mercury and the method of exposure determine which of these health effects will be more severe. For example, organic mercury that is eaten in contaminated fish or grain may cause greater harm to the brain and developing fetuses than to the kidneys; inhaled metallic mercury vapor may cause greater harm to the brain; and inorganic mercury salts that are ingested may cause greater harm to the kidneys. Thus, maternal exposure to organic mercury may lead to brain damage in fetuses; adults exposed to metallic mercury vapor may develop shakiness (tremors), memory loss, and kidney disease.

Short-term exposure to high levels of inorganic and organic mercury will have similar health effects. However, full recovery is more likely after short-term exposure. Mercury has not been shown to cause cancer in humans.

What levels of exposure have resulted in harmful health effects?

An exact exposure level cannot be determined for some known health effects. For example, eating fish or grain contaminated with high levels of organic mercury can cause brain damage, especially in developing infants. However, an estimate of the exact level of mercury that would cause this effect cannot be determined because the amount of mercury in food, and the amount of contaminated food eaten, is unknown. In addition, long-term of high levels of mercury vapor can cause brain damage.

What recommendations has the federal government made to protect human health?

The Environmental Protection Agency (EPA) has limited the level of inorganic mercury in rivers, lakes, and streams to 144 parts per billion (ppb). EPA requires the reporting of all releases of more than one pound of mercury metal into the environment. The Food and Drug Administration limits levels of mercury in bottled water to no more than 2 ppb.

How are mercury releases controlled?

Current federal guidelines limit air emissions of mercury generated by incinerators or drying of wastewater sludge. Spills which do occur must be cleared with a special vacuum cleaner and washed with dilute calcium sulfide solution. Small quantities can be gathered by mixing the spilled mercury with copper metal granules.

For more information about Mercury, please contact EPA at the following address:

U.S. Environmental Protection Agency
ATTN: Superfund Hotline
401 M Street, S.W.
Washington, D.C. 20460
1-800-424-9346 or 1-800-535-0202

GLOSSARY

Background Levels: The concentration of any substance which would normally be found in an area. This level is used as a basis of comparison in identifying contamination levels.

Element: All substances are made up of elements, which are the basic components, or parts, of all materials. Elements cannot be separated or broken down into smaller units by ordinary chemical means.

Groundwater: Water found below the surface, usually in sands or a rock formation. Much of our domestic water supply is drawn from groundwater wells.

Inhalation: To draw air, vapor, etc. into the lungs; to breathe.

Inorganic: A compound which does not contain carbon and is derived from mineral sources. Metals are inorganic compounds.

Microorganisms: Microscopic animal or plant life; particularly any of the bacteria, protozoans, viruses, etc.

National Priorities List: EPA's list of uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund Program.

Organic: A compound which contains carbon and is derived from animal or plant sources.

Superfund Program: The program operated under the legislative authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) that funds the EPA solid waste emergency and long-term removal and remedial activities.

Toxic: Acting as a poisonous or hazardous substance; having poisonous or harmful qualities.

Vapor: Gaseous form of a substance which can be carried in the air and may expose individuals through inhalation.

The information contained in this fact sheet was compiled from the Toxicological Profile for Mercury, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, in collaboration with the U.S. Environmental Protection Agency, December, 1989. *This fact sheet focuses on the impact of hazardous wastes on human health; however, EPA does evaluate these impacts on the environment, including plants and animals.*

EPA Facts About
Polychlorinated Biphenyl

June 1992

What are PCBs?

The abbreviation PCB refers to polychlorinated biphenyls. PCBs are a family of man-made chemicals that contain 209 individual compounds with varying toxicity. Commercial formulations of PCBs enter the environment as mixtures consisting of a variety of PCBs and impurities. Because of their insulating and nonflammable properties, PCBs have been used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. The manufacture of PCBs in the United States stopped in 1977 because of evidence that PCBs accumulate in the environment and may cause health hazards.

How might exposure to PCBs occur?

Although PCBs are no longer manufactured, human exposure still occurs. Many older transformers and capacitors use fluids that contain PCBs. The useful lifetime of many of these transformers can be 30 years or more.

The two main sources of human exposure to PCBs are environmental and occupational. PCBs are very persistent chemicals and are widely distributed throughout the environment. They have been found in approximately 314 of the 1,300 hazardous waste sites on the *National Priorities List (NPL)*. *Background levels* of PCBs can be found in the outdoor air, on soil surfaces, and in water.

Eating contaminated fish can be a major source of PCB exposure. Although PCBs found in fish are generally concentrated in nonedible portions, the amounts in edible portions are high enough to make consumption a major source of exposure. Exposure through breathing outdoor air containing PCBs is small compared with the intake of PCBs through eating contaminated fish.

Most PCBs in outdoor air may be present because of a natural cycle. PCBs in surface water, or on soil surfaces, evaporate and are then returned to earth by rainfall or settling of dust particles. Re-evaporation repeats the cycle. Once in the air, PCBs can be carried long distances; they have been found in snow and seawater in the Antarctic. In addition, contaminated indoor air may be a major source of human exposure to PCBs, particularly in buildings with PCB-containing devices.

PCBs can be released into the environment from: (1) poorly maintained toxic waste sites that contain PCBs; (2) illegal or improper dumping of PCB wastes, such as transformer fluids; (3) leaks or *fugitive emissions* from electrical transformers containing PCBs; and (4) disposal of PCB-containing consumer products into municipal landfills, rather than into hazardous waste landfills.

How do PCBs enter the body?

PCBs enter the body through contaminated food and air and through skin contact. The most common route of exposure is eating fish and shellfish from PCB-contaminated water. Exposure from drinking water is minimal. It is known that nearly everyone has PCBs in their bodies, including infants who drink breast milk containing PCBs.

How do PCBs affect human health?

Animal experiments have shown that some PCB mixtures produce adverse health effects including liver damage, skin irritations, reproductive and developmental effects, and cancer. Therefore, it is prudent to consider that there may be health hazards for humans. Human studies to date show that skin irritations, such as acne-like lesions and rashes, can occur in PCB-exposed workers. Other studies of occupational exposure suggest that PCBs may cause liver cancer. Reproductive and developmental effects may also be related to occupational exposure and eating contaminated fish. While the role of PCBs in producing cancer, and reproductive and developmental effects in humans cannot be clearly delineated, the evidence provides an additional basis for public health concern over exposure to PCBs.

Is there a medical test to identify PCB exposure?

There are tests to determine PCBs in the blood, body fat, and breast milk. These tests are not routine clinical tests. Although the tests indicate exposure to PCBs, they do not predict potential health effects. Blood tests are the easiest, safest and, perhaps, the best method for detecting recent, large exposures. It should be recognized that nearly everyone has been exposed to PCBs, and that nearly everyone is likely to have detectable levels of PCBs in their bodies.

What levels of exposure have resulted in harmful health effects?

EPA advises that exposure to concentrations of PCB 1016 (one form of PCBs) below 3.5 parts per billion (ppb) is not expected to cause adverse health effects in adults. Children exposed to PCB 1016 concentrations below 1 ppb are not expected to experience adverse health effects. The term "parts per billion" is a way of expressing the concentration or strength of a contaminant in a liquid or air. One part per billion is equal to one inch in a distance of about sixteen thousand miles (or a penny in ten million dollars), a very small amount.

What recommendations has the federal government made to protect human health?

Based on evidence that PCBs cause cancer in animals, the Environmental Protection Agency (EPA) considers PCBs to be probable cancer-causing chemicals in humans.

The Food and Drug Administration (FDA) specifies PCB concentration limits of 0.2 to 3 parts per million in infant foods, eggs, milk (in milk fat), and poultry (fat).

What are the methods of treatment and disposal of PCBs?

Early federal regulations specified incineration as the only acceptable method of PCB disposal. EPA's present PCB disposal rules require disposal in chemical-waste landfills, or by destruction in high-temperature incinerators or high-efficiency boilers.

GLOSSARY

Background Levels: The concentration of any substance which would normally be found in an area. This amount is used as a basis of comparison in identifying contamination levels.

Fugitive Emissions: Any release of contaminants from products of manufacturing processes, usually in the form of gases escaping into the atmosphere.

National Priorities List (NPL): EPA's list of uncontrolled or abandoned hazardous waste sites identified for possible long-term clean-up under the Superfund Program.

For more information about PCBs, please contact EPA at the following address:

U.S. Environmental Protection Agency
ATTN: Superfund Hotline
401 M Street, S.W.
Washington, D.C. 20460
1-800-424-9346 or 1-800-535-0202

The information contained in this fact sheet was compiled from the Toxicological Profile for PCBs, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, in collaboration with the U.S. Environmental Protection Agency, June, 1989. *This fact sheet focuses on the impact of hazardous wastes on human health; however, EPA does evaluate these impacts on the environment, including plants and animals.*

EPA Facts About *Trichloroethylene*

June 1992

What is trichloroethylene?

Trichloroethylene (TCE) is a colorless liquid with an odor similar to ether. It is man-made and does not occur naturally in the environment. TCE is used mainly as a solvent to remove oils and grease from metal parts.

How might exposure to trichloroethylene occur?

Trichloroethylene has been found in approximately 745 of the 1,300 hazardous waste sites on the *National Priorities List (NPL)*. Various federal and state surveys indicate that between 9 and 34% of the water supply sources in the United States may be contaminated with trichloroethylene. In addition, TCE present at disposal sites is released to the air by evaporation and to underground water as *leachate*.

Trichloroethylene can also be released to the environment through evaporation from adhesive glues, paints, coatings, and other chemicals; and during their production. Releases can also occur during air-cleaning processes at treatment facilities that receive wastewater containing TCE, and during incineration of municipal and hazardous wastes.

Is there a medical test to identify trichloroethylene exposure?

Recent or ongoing exposures to trichloroethylene can be determined by measuring TCE in the breath. Another way of determining whether exposure to trichloroethylene has occurred is by measuring a number of *breakdown products* (metabolites) of TCE in the urine or blood. Because one of the breakdown products, trichloroacetic acid, is removed very slowly from the body, it can be measured in the urine for up to about one week following exposure. Exposure to other chemicals can produce the same breakdown products in the urine and blood as TCE. Therefore, these methods cannot be used to indicate conclusively that exposure to trichloroethylene has occurred.

How can trichloroethylene affect human health?

Dizziness, headaches, slowed reaction time, sleepiness, and facial numbness have occurred in workers breathing trichloroethylene or in people using trichloroethylene products in small, poorly ventilated areas. These effects are also caused by ingestion of several ounces of undiluted TCE. Irritation of the eyes, nose, and throat can also occur under these conditions. More severe effects, such as unconsciousness or possibly death, can occur from drinking or breathing higher amounts of TCE. Generally, the less severe central nervous system effects that result from one or several exposures to trichloroethylene disappear when exposure ends.

Results of a few studies of pregnant animals exposed to trichloroethylene in air or in food showed effects on unborn animals or on newborns. Current information based on animal studies is not sufficient to determine whether cancer, or the effects seen in animal embryos following exposure to TCE, may also occur in humans.

Some harmful health effects may persist following long-term exposure to trichloroethylene. This information is based largely on animal studies. These studies show that ingesting or breathing levels of TCE that are higher than typical *background levels* can produce nervous system changes; liver and kidney damage; effects on the blood; tumors of the liver, kidney, lung, and male sex organs; and possibly cancer of the tissues that form white blood cells (leukemia). Alcohol consumption can heighten susceptibility to liver and kidney injury caused by trichloroethylene exposure.

How does trichloroethylene enter the body?

Trichloroethylene can enter the body through inhalation of contaminated air or ingestion of contaminated water. TCE can also enter the body through contact with the skin.

What levels of exposure have resulted in harmful health effects.

Tests using laboratory animals and humans show that short-term and long-term exposures to air containing about 50 parts per million (ppm) or more of trichloroethylene have produced harmful effects. The term "parts per million" is a way of expressing the concentration of a contaminant in a liquid or air. One part per million is equal to one inch in a distance of about sixteen miles (or a penny in ten thousand dollars), a very small amount. Ingestion of TCE for more than two weeks produced harmful effects in the livers of animals. Drinking TCE over longer periods of time caused effects on unborn animals and the kidneys as well as the liver.

Based on animal studies, the Environmental Protection Agency (EPA) has estimated that breathing air containing 1 ppm trichloroethylene every day for 70 years may place as many as 930 persons in a population of 100,000 at risk of developing cancer. EPA has also estimated that drinking water containing 1 ppm TCE every day over a lifetime may place as many as 32 persons in a population of 100,000 at risk of developing cancer.

What recommendations has the federal government made to protect human health?

EPA has established a drinking water standard of 5 parts of trichloroethylene per billion parts of water (ppb). EPA requires industry to report spills of 1,000 pounds or more of trichloroethylene. A reduction of this amount to 100 pounds has been proposed.

What are the methods of treatment and disposal of trichloroethylene?

The recommended method of TCE disposal is incineration following mixing with a combustible fuel. Complete combustion must be achieved to prevent the formation of phosgene, a poisonous gas. An acid scrubber must be used to remove the haloacids produced. There has been an emphasis on recovery and recycling of TCE to reduce emissions into the atmosphere.

Glossary

Background Level: The concentration of any substance which would normally be found in an area. This level is used as a basis of comparison in identifying contamination levels.

Breakdown Products: Most contaminants are combinations of specific substances. Contaminants are degraded, or separated, into these individual substances through chemical or physical means.

Leachate: A contaminated liquid that results from water collecting contaminants as it trickles through wastes, agricultural pesticides, or fertilizers.

National Priorities List (NPL): EPA's list of uncontrolled or abandoned hazardous waste sites identified for possible long-term clean-up under the Superfund Program.

For more information about Trichloroethylene, please contact EPA at the following address:

U.S.Environmental Protection Agency
ATTN: Superfund Hotline
401 M Street, S.W.
Washington, D.C. 20460
1-800-424-9346 or 1-800-535-0202

The information contained in this fact sheet was compiled from the Toxicological Profile for Trichloroethylene, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, in collaboration with the U.S. Environmental Protection Agency, October, 1989. *This fact sheet focuses on the impact of hazardous wastes on human health; however, EPA does evaluate these impacts on the environment, including plants and animals.*

INSTALLATION RESTORATION PROGRAM

INDIAN HEAD DIVISION,
NAVAL SURFACE WARFARE CENTER
101 STRAUSS AVENUE
INDIAN HEAD, MARYLAND
20640-5035

RESTORATION ADVISORY BOARD (RAB) MEETING COMMENTS, QUESTIONS AND ANSWERS

February 17, 2000

Installation Restoration (IR) Site 57 Remedial Investigation (RI) Report Update

Question: Was the risk assessment for cancer based only on the dichloroethylene (DCE)? Also, does this assessment incorporate chemicals that may be present from other sites?

Answer: The cancer risk from this site is not based solely on DCE. Even though we analyze for cancer-causing chemicals, such as DCE and trichloroethylene (TCE), separately, cancer risk is cumulative. In addition, the risk calculated includes any other chemicals not related to the site that may have been encountered in samples taken. However, DCE makes up the largest portion of the cancer risk for this site.

Question: What was the concentration of arsenic at this site and where did it come from? Also, could TCE be leaching arsenic from background?

Answer: The highest concentration of arsenic was located near the southeastern corner of Building 292 at a concentration of 130 parts per million (ppm). We are unsure of the source of the arsenic.

The average concentration of arsenic in backgound samples was around 2 ppm. We do not believe that the arsenic found at this site is leaching from background.

Question: Are you planning on handling the TCE as an interim action or are you going for residential cleanup?

Response: We expect that cost will probably limit us to the nonresidential (industrial) cleanup.

Attachment I

Question: Do you have any idea of the projected cost for the final cleanup? Will it double from what has already been spent on the site?

Answer: The cleanup cost could easily double, depending on the selected remedy. For example, pump and treat technologies, which are not very effective, can remain in place for 30 years, or more. Therefore, we are looking at passive techniques, such as a reactive wall, which will treat the TCE in place.

Question: As you are doing the Feasibility Study (FS), are you going to do it on a small scale first or base it on processes that worked.

Answer: We plan on using a technology that has worked, such as the reactive wall. This will be followed by natural attenuation, which will involve monitoring to ensure that natural attenuation is occurring at a sufficient rate.

Question: Are you preventing the release of TCE into the Mattawoman Creek?

Answer: No. However, currently levels are one-third of what they used to be. Before the Removal Action (lining of the pipe), the TCE concentration at Industrial Wastewater Outfall 80 (IW80) was approximately 60 parts per billion (ppb). The current concentration is 20 ppb, which is well under the permitted discharge limit of 100 ppb.

Question: Were both the trans- and cis- isomers of DCE analyzed for during sampling?

Answer: We are not sure. We will check on this.

Comment: Detection of these isomers can assist in showing that natural attenuation is occurring at the site.

IR Site 47 Remedial Investigation (RI) Report Update

Question: Historically, what operations took place at this site and where is the site located?

Answer: Chemical manufacturing took place at IR Site 47 (Building 856). This building is located in the Pilot Plant section of the Activity.

Question: Are carbon tetrachloride and chloroform more of a concern at this site than metals, such as mercury.

Answer: Yes. The values detected in the shallow groundwater exceed the Maximum Contaminant Levels (MCLs) established for drinking water. However, the shallow groundwater in the area is not used for drinking water.

IR Sites 12, 41, and 42 Feasibility Study (FS) and Remedial Design (RD) Update

Question: What do you plan on doing at Site 12?

Comment: We plan to use institutional controls. This would include land use controls, such as fences, and we will put this area in the Activity Master Plan to ensure that it is not disturbed by construction projects.

Question: What do you plan to do with the soil that you remove from Site 41? Will it be brought to Stump Neck like the soil from Site 5?

Answer: The soil from Site 41 will be sent off-site for disposal. Once removed, it will be a hazardous waste according to the Resource Conservation and Recovery Act (RCRA). The silver contaminated soil from Site 5 was not a RCRA hazardous waste. It was removed based on ecological concerns, rather than human health concerns.

Question: When you remove the soil from Site 41, are you going to leave the concrete slab exposed?

Answer: The soil will be removed, then the slab will be steam cleaned and tested for PCBs to ensure that the Remedial Action was effective.

Question: Will treatment be done on the soil prior to disposal off-site?

Answer: No.

Comment: Pretreatment, if necessary, is typically a requirement of the facility that receives the waste.

Question: Since you have the Proposed Plan, the Record of Decision, and the Remedial Design lumped together, can you tell how much they are individually?

Answer: Yes.

RI for Sites 53, 49, 15, and 16

Question: Is it possible for mercury to travel through the air?

Answer: Yes.

Question: Has the air been tested?

Answer: The air in the buildings has been tested. In fact, Building 102 was closed due to elevated levels of mercury in the air and one room in Building 101 was also closed for the same reason.

Question: Is the mercury in the air coming from the sewer?

Answer: No. Manometers, a type of lab equipment that contains mercury, occasionally broke in the building and the mercury leaked into the wood flooring. Initial cleanup inside the building has been done. However, residual mercury still remains in the sewer lines coming from the building.

Question: Is the sewer sytem connected to the local sanitary system?

Answer: No. All buildings on the Activity that have sanitary sewer discharges are connected to our on-site sanitary sewage treatment facility.

Mattawoman Creek Study Update

Question: Who is the contractor that will be doing the study?

Answer: TetraTech NUS.

Question: What historical information will you be using?

Answer: We will be using a variety of information and sources, including analysis from 15 to 20 years ago and more recent sampling. We also plan to compile data from outside sources, such as the U.S. Fish and Wildlife Service.

Question: Has this been scheduled yet?

Answer: No. However, we (Navy and contractor) will be meeting in a couple of weeks to start working on a plan for the study, including the schedule.

RI For Sites 11, 13, 17, 21, and 25

Question: At Site 17, is there chemical residue in the drums, or are the old, rusting drums just unsightly?

Answer: There appears to be wax in the old, rusting drums. We plan to sample the possible wax to determine exactly what it is.

Question: Is Site 25 near the Extrusion Plant?

Answer: Yes, Building 588 is located in the Extrusion Plant.

INDIAN HEAD DIVISION, NAVAL SURFACE WARFARE CENTER

INSTALLATION RESTORATION PROGRAM RESTORATION ADVISORY BOARD (RAB) MEETING AGENDA (Tentative)

June 15, 2000

1. **IR Site 47 RI Report Update**

2. **Mattawoman Creek Study**

3. **IR Site 42 Toxicity Testing**

Attachment J

RESTORATION ADVISORY BOARD

MEMBERSHIP APPLICATION

NAVSEA INDIAN HEAD

Indian Head Division, Naval Surface Warfare Center

Conditions for Membership:

Restoration Advisory Board (RAB) members shall serve a term of two years (if possible) and attend all RAB meetings. Members who miss two or more consecutive meetings may be asked to resign. Members must be able to attend approximately three meetings per year on Thursday evenings and agree to have their name, address, home and work phone numbers provided to the community. Duties and responsibilities will include reviewing and commenting on technical documents and activities associated with the environmental restoration of the Indian Head Division, Naval Surface Warfare Center. Members will be expected to be available to community members and groups to facilitate the exchange of information and/or concerns between the community and the RAB.

NOTE: Local residents will be preferred for RAB membership. The number of RAB members is limited.

Name: _____

Address: _____
Street Apt. # City State ZIP

Phone: ( ) _____ ( ) _____ **Fax:** ( ) _____
Work Home

Profession: _____

1. Please list any organizations or group affiliations with which you are associated. (Volunteer, church, etc.)

_____

_____

2. Are you able to meet the requirements of the Conditions for Membership above? ____Yes ____No

3. How long have you lived in this community? _____ Years
How long have you worked in this community? _____ Years
Have you ever worked at IHDIV, NSWC? ____Yes ____No

4. Briefly state why you would like to be considered for membership on the Restoration Advisory Board (RAB):

_____

_____

5. By submitting this signed application, you willingly agree to work cooperatively with other members of the committee to ensure efficient use of time for addressing community issues related to environmental restoration of the Indian Head Division, Naval Surface Warfare Center.

_____ _____
Applicant Signature Date

NOTE: Applications must be completed and returned by **March 31, 2000,** to be considered for membership on the RAB!

Please fold, as shown on reverse side, add stamp, seal, and drop in any mailbox, or FAX to (301) 744-4180.

ENCLOSURE(3)

RESTORATION ADVISORY BOARD

MEMBERSHIP APPLICATION

NAVSEA INDIAN HEAD

Indian Head Division, Naval Surface Warfare Center

Conditions for Membership:

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NOTE: Local residents will be preferred for RAB membership. The number of RAB members is limited.

Name: _____

Address: _____
Street Apt. # City State ZIP

Phone: ( ) _____ ( ) _____ **Fax:** ( ) _____
Work Home

Profession: _____

1. Please list any organizations or group affiliations with which you are associated. (Volunteer, church, etc.)

_____

_____

2. Are you able to meet the requirements of the Conditions for Membership above? ____Yes ____No

3. How long have you lived in this community? _____ Years
How long have you worked in this community? _____ Years
Have you ever worked at IHDIV, NSWC? ____Yes ____No

4. Briefly state why you would like to be considered for membership on the Restoration Advisory Board (RAB):

_____

_____

5. By submitting this signed application, you willingly agree to work cooperatively with other members of the committee to ensure efficient use of time for addressing community issues related to environmental restoration of the Indian Head Division, Naval Surface Warfare Center.

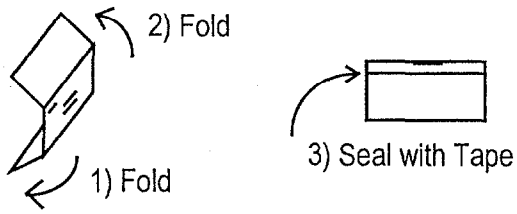
_____ _____
Applicant Signature Date

NOTE: Applications must be completed and returned by **March 31, 2000,** to be considered for membership on the RAB!

Please fold, as shown on reverse side, add stamp, seal, and drop in any mailbox, or FAX to (301) 744-4180.

ENCLOSURE(3)

2) Fold Here

INDIAN HEAD DIVISION,
NAVAL SURFACE WARFARE CENTER
ATTN: CODE 046, BLDG D-327
101 STRAUSS AVENUE
INDIAN HEAD, MD 20640-5035

1) Fold Here 3) Seal Here