U.S. EPA Region III
Regional Center for Environmental Information
1650 Arch Street (3PM52)
Philadelphia, PA 19103

SYNOPSIS

1990 FEDERAL FACILITIES CONFERENCE

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION III

Ramada Inn
Annapolis, Maryland
December 4 - 6, 1990

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Prepared for:

U.S. Environmental Protection Agency, Region III
Philadelphia, Pennsylvania

Prepared by:

Gannett Fleming, Inc.
Harrisburg, Pennsylvania

ACKNOWLEDGEMENT

The Region III Federal Facilities Conference was the result of the collaboration of a team of talented professionals in the Environmental Services Division. I would like to acknowledge the hard work and dedication of Karen DelGrosso, Kurt Goetske, Danielle Algazi, Mary Ann Boyer, Diana Esher, and especially our conference managers, Phyllis Troilo and Jayne Dahm.

Lorraine Urbiet
Federal Facilities Coordinator
January 1991

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INTRODUCTION

EPA REGION III FEDERAL FACILITIES CONFERENCE

An EPA, Region III Federal Facilities Conference was held December 4, 5 and 6, 1990 in Annapolis, Maryland at the Ramada Inn. The presentations and discussions fell into several broad categories; (1) Pollution Prevention Strategies, (2) Regulatory Requirements, and (3) Compliance.

Speakers made presentations in plenary sessions on Tuesday, Wednesday and Thursday mornings. Seven workshops were held during two sessions on Tuesday afternoon where participants could choose to attend two workshops.

On the afternoon of the second day of the conference, participants had an opportunity to participate in a workshop for developing a long-term compliance plan for the Chesapeake Bay Watershed. The workshop was preceded by a review of the year long initiative in the Chesapeake Bay including the development of original goals, framework, and procedures. The second activity option for this afternoon was a tour of the Navy's David Taylor Laboratory at the U.S. Naval Academy and a tour of the EPA Region III Central Regional Laboratory (CRL). The CRL tour included a brief review of laboratory facilities and analytical capabilities.

This synopsis summarizes the presentations given at the conference. The handouts distributed at the conference are included. A list of attendees is presented in an appendix at the end of the document.

1990 FEDERAL FACILITIES CONFERENCE
EPA, Region III

Ramada Inn, Annapolis, MD

AGENDA

Tuesday, December 4

8:00 a.m.	**Registration**	
8:30 a.m.	**Welcome/Conference Logistics**	
		Lorraine Urbiet Federal Facilities Coordinator
8:45 a.m.	**Opening Remarks**	
		Edwin B. Erickson EPA Region III Administrator

A PRACTICAL GUIDE TO POLLUTION PREVENTION

9:30 a.m.	**Overview of EPA's Pollution Prevention Strategy**	
		Stanley L. Laskowski, Director Office of Pollution Prevention and Planning EPA, Headquarters
9:45 a.m.	**Pollution Prevention Initiatives for Federal Facilities**	
		James R. Edward Office of Pollution Prevention EPA, Headquarters
10:30 a.m.	**Break**	
11:00 a.m.	**Stratospheric Ozone Protection and Pollution Prevention**	
		Elizabeth Creel, Project Manager Technology Transfer and Industry Programs Division of Global Change EPA, Headquarters
11:30 a.m.	**The Defense Logistics Agency's Pollution Prevention** Program: The Life Cycle of DoD Waste Materials	
		Joseph Hoenscheid Senior Environmental Scientist Defense Logistics Agency
12:00 Noon	**Lunch** (on your own)	

1:15 p.m. **Workshops:**

Workshop A: Refresher Course on TSCA PCB Control Requirements

Charlene Harrison, PCB Coordinator
TSCA Enforcement Section
EPA, Region III

Workshop B: New Developments in CERCLA

- The New Hazard Ranking Model
  Henry Sokolowski, Chief
  CERCLA Federal Facilities Section
  EPA, Region III

- Community Outreach Requirements
  Alan Brown
  Community Relations Coordinator
  EPA, Region III

Workshop C: New Drinking Water Requirements

- Update on New Drinking Water Standards/How Can Small Systems Comply?
  Jeffrey Hass, Chief
  Drinking Water Section
  EPA, Region III

- The Underground Injection Control Program
  Karen Johnson, Chief
  UIC Section
  EPA, Region III

Workshop D: Pollution Prevention Auditing

- James S. Bridges, Chief, Products Assessments Section
  Pollution Prevention Research Branch
  Risk Reduction Evaluation Laboratory (RREL)
  EPA, Cincinnati, Ohio

- Gary O. Kosteck, P.E.
  U.S. Army
  Production Base Modernization Activity
  Picatinny Arsenal, NJ

Workshop E: Spill Prevention and Response

Vincent E. Zenone
George W. English
On-Scene Coordinators
EPA, Region III

Workshop F: Underground Storage Tank (UST) Compliance

Wayne Naylor, Chief
UST/LUST Section
EPA, Region III

Workshop G: Clean Air Act Requirements for Proper Notification and Removal of Asbestos from Buildings

Pauline G. Levin, Chief
Pesticides and Grants Section
EPA, Region III

5:00 p.m. **Workshops End**

Wednesday, December 5

8:45 a.m. **Keynote Address - Is Total Compliance Achievable?**

Christian R. Holmes
Deputy Assistant Administrator for Federal Facilities
Office of Enforcement
EPA, Headquarters

9:45 a.m. **The New Office of Federal Facility Enforcement - Organization and Goals**

Gordon M. Davidson, Director
Office of Federal Facility Enforcement
EPA, Headquarters

10:30 a.m. **Break**

10:45 a.m.	**Panel Discussion: Building a Multi-media Environmental Management Program**	

<u>Moderator:</u> Robert E. Greaves, Chief
RCRA Enforcement & UST Branch
EPA, Region III

Len Richardson, Director
Environmental Support Office
U.S. Department of Defense

Captain James Taylor
Commander
Norfolk Naval Shipyard

Colonel Gerald P. Williams
Deputy Commanding Officer
Fort Belvoir

12:00 Noon **Lunch** (on your own)

1:15 p.m. **The Chesapeake Bay Compliance Initiative**

Lorraine Urbiet
Federal Facilities Coordinator

Neil Swanson, Manager, Bay Federal Facilities and
Multi-media Compliance Initiative
EPA, Region III

2:00 p.m. **Working Session:** Developing a Long-Term Compliance Plan for the Chesapeake Bay Watershed

Facilitators:

Richard V. Pepino, Chief
Environmental Assessment Branch
EPA, Region III

Carol Stokes-Cawley, Chief
NPDES General Enforcement Section
EPA, Region III

Recorder:

Diana Esher, Chief
Environmental Planning and Assessment Section
EPA, Region III

Participants:

EPA, State, and Federal Agency Representatives (all levels)

3:00 p.m. **Break**

3:15 p.m. **Working Session on Compliance Plan Continues**

5:00 p.m. **Working Session Ends**

(An alternate activity for this afternoon will be a tour of EPA's Central Regional Laboratory, including a chance to meet informally with some of the Region III inspectors and a tour of the David Taylor Laboratory, a Navy research laboratory. The tour will leave via bus from the Ramada Inn at 1:00 p.m.)

Thursday, December 6

9:00 a.m. **Status Report From the Working Session on the Long-Term Compliance Plan**

9:45 a.m. **Progress Report on the DoD/EPA Agreement on the Chesapeake Bay**

Len Richardson
Director
Environmental Support Office
U.S. Department of Defense

10:15 a.m. **Break**

10:30 a.m. **The Toxics Reduction Strategy for the Chesapeake Bay**

Richard Batiuk
Chesapeake Bay Liaison Office
EPA, Region III, Annapolis Office

11:30 a.m. **Close of Conference**

COURSE DESCRIPTIONS

Tuesday, December 4

9:30 a.m. **Overview of EPA's Pollution Prevention Strategy.** EPA was required by Congress to develop a pollution prevention strategy which would set a course of action for pollution prevention activities nation-wide. The Director of EPA's Office of Pollution Prevention and Planning will give a status report on the strategy and summarize the basic elements.

9:45 a.m. **Pollution Prevention Initiatives for Federal Facilities.** EPA's Office of Pollution Prevention has developed a model for a regional approach to pollution prevention for federal facilities. The model is being tested using three military installations in the Tidewater Virginia Area.

11:30 a.m. **The Defense Logistics Agency's Pollution Prevention Program: The Life Cycle of DoD Waste Materials.** A Description of DLA's Comprehensive Hazardous Materials Management Program (CHAMMP), which uses a "life cycle" approach to hazardous materials management and waste minimization.

11:00 a.m. **Stratospheric Ozone Protection and Pollution Prevention.** A discussion on pollution prevention and how it can, and should, become an integral part of efforts to reduce and eliminate the use of ozone-depleting chemicals.

1:15 p.m. **Workshop A: A Refresher Course on TSCA PCB Control Requirements.** Basic Information on PCB regulations, including storage, disposal and EPA's spill cleanup policy. A case study will be presented. Also a summary of the new PCB fire rule.

Workshop B: New Developments in CERCLA. The New Hazard Ranking Model. The new Hazard Ranking Model will probably result in higher scores for federal facilities. A description of the changes and how they could affect a site.

Community Outreach Requirements. A preview of new community outreach requirements for federal facilities with NPL or proposed NPL sites.

Workshop C: New Drinking Water Requirements. Update on New Drinking Water Standards/How Can Small Systems Comply? Under the 1986 amendments to the Safe Drinking Water Act (SDWA), federal facilities that meet the criteria for a public water system will have to meet requirements to control over 100 microbiological and chemical contaminants on the new and revised drinking water standards. It focuses on the impact on small systems like industrial buildings, schools, hospitals, campgrounds, and park facilities with their own water supply.

The Underground Injection Control Program. An overview of the UIC regulations under the SDWA. The rules cover a broad range of disposal wells from floor drains in automotive shops to injection wells.

Workshop D: Pollution Prevention Auditing: The Army's Perspective. An overview of the Army's hazardous waste minimization program. How to audit facility operations to identify and evaluate waste streams.

Pollution Prevention Research Branch. Case studies and assessments from the Office of Research and Development.

3:00 p.m. **Workshop E: Spill Prevention and Response.** A review of the federal Spill Prevention Counter-measure and Control (SPCC) regulations for the storage of petroleum products in above ground tanks. Also, an abbreviated version of the First Responders Training offered by EPA, Region III.

Workshop F: Underground Storage Tank (UST) Compliance. A review of the basic requirements of the UST program.

Workshop G: Clean Air Act Requirements for Proper Notification and Removal of Asbestos from Buildings. A review of the NESHAPS requirements for advance notification of projects to remove asbestos from buildings and requirements for proper disposal. Includes a brief overview of the asbestos in schools regulations for facilities with schools on-site.

Wednesday, December 5

8:45 a.m. **Keynote Address - Is Total Compliance Achievable?** A discussion on the environmental challenges at federal facilities with emphasis on the identification of problem areas and securing resources to address these problems.

9:45 a.m. **The New Office of Federal Facilities Enforcement - Organization and Goals.** The Director of the Office of Federal Facilities Enforcement at EPA, Headquarters will describe the new organization, responsibilities, and program direction.

10:45 a.m. **Panel Discussion: Building a Multi-media Environmental Management Program.** The panel will focus on the need to develop a facility-wide multi-media environmental management program to improve compliance. Panelists will present the EPA and DoD perspective. Captain Taylor and Colonel Williams will offer the command level perspective.

1:00 p.m. **Tour.** The first stop on the tour will be the EPA, Region III Central Regional Laboratory (CRL). The CRL tour will include a brief review of laboratory facilities and analytical capabilities. It will trace samples and chemicals from receipt in the lab through analyses to final disposal. Written and computer-based tracking systems that document the status of samples, chemicals, and wastes will be discussed. CRL has a package system for solvent recovery that you will see.

After the CRL tour, a few of the Region III inspectors will join you for a "meet the inspectors" session to discuss inspection procedures. This will give you an opportunity to exchange information that is inappropriate during a formal inspection (i.e., if you ever wanted to ask a general question on procedures or responsibilities, now is the time to do it.)

The final stop on the tour will be the Navy's David Taylor Laboratory. Besides a tour, the lab has several projects involving improved management of wastes on ships that they will describe for you.

1:15 p.m. **The Chesapeake Bay Compliance Initiative.** A review of the year long initiative, including the development of the original goals, framework, and procedures. A status report on progress. This will provide a base of information for the working session that will follow.

2:00 p.m. **Developing a Long-Term Compliance Plan for the Chesapeake Bay Watershed.** EPA wants to develop a long-term compliance plan to provide a framework to keep compliance at the highest possible level after this year. State agency representatives will join EPA and federal facilities to evaluate the 1990 initiative during Part 1 of the session. Part 2 will take the information on what worked and what didn't and use it to collect ideas for a long-term plan.

The session will not result in a finished document but this will be an important opportunity for facility level input early in the development process.

Thursday, December 6

9:00 a.m. **Report on the Long-Term Compliance Plan.** A status report on the results of the working session on Wednesday.

9:45 a.m. **Progress Report on the DoD/EPA Agreement on the Chesapeake Bay.** On April 20, 1990, Defense Secretary Dick Cheney and EPA Administrator William K. Reilly signed a new Cooperative Agreement on the Chesapeake Bay. In the Agreement, DoD made commitments on nutrient and toxics reduction, pollution prevention, funding for compliance, training, wetlands preservation, and nonpoint source control. This is the first progress report.

10:30 a.m. **The Toxics Reduction Strategy for the Chesapeake Bay.** An explanation of the Baywide Toxics Reduction Strategy and the role that federal facilities can plan in reducing toxic loadings to the Chesapeake Bay.

1.1 OVERVIEW OF EPA'S POLLUTION PREVENTION STRATEGY

Stanley Laskowski, Director, Office of Pollution Prevention, EPA, Headquarters, Washington, D.C..

Mr. Laskowski presented an overview of EPA's Pollution Prevention Strategy. The Pollution Prevention Act was signed into law in November, 1990. The main goal of the Act is to reduce or prevent pollution at the source wherever possible. In situations where it is not possible to prevent pollution at the source the law requires consideration of the following actions in this order; 1) recycle, 2) treatment and 3) disposal.

Strategies for implementing pollution prevention are focused on these five sectors;

1) Manufacturing Facilities
2) Agriculture
3) Energy and Transportation
4) Federal Government
   - procurement regulations
   - management of federal lands
5) Consumer Sector
   - environmental labeling
   - energy conservation
   - public sector

Mr. Laskowski recommended that federal facilities begin to do their part by; 1) reducing quantities of releases of toxic chemicals, 2) conducting energy audits, 3) managing non-point sources of pollution (stormwater runoff) on federal lands and 4) promoting education at facilities on pollution prevention.

2.1 POLLUTION PREVENTION INITIATIVES FOR FEDERAL FACILITIES

2.2 ATTACHMENTS

- Pollution Prevention/Recycling Executive Order
- Industry Specific Pollution Prevention Waste Minimization Audit Manual
- Environmental Auditing Workshop for Federal Facilities
- The Pollution Prevention Information Clearinghouse

2.1 POLLUTION PREVENTION INITIATIVES FOR FEDERAL FACILITIES

James R. Edward, Deputy Director, Prevention Integration Branch, Office of Pollution Prevention, EPA, Headquarters, Washington, D.C.

Mr. Edwards gave an overview of EPA's Pollution Prevention Program authorized under the 1990 Pollution Prevention Act, Senate Bill # 585. The program represents a fundamental change in EPA's policy to prevent pollution at the start. The hierarchy of environmental protection practices is as follows:

1) reduction
2) recycle
3) treatment
4) disposal

The program recognizes that pollution prevention is multimedia (water and air) as well as multi-sectoral (industry, agriculture and consumer).

Provisions contained in the program regarding federal facilities emphasize 1) reduction of source production at all facilities and 2) careful evaluation of procurement programs. Procurement guidelines are being developed for various recycled goods including paper, insulation and recycled tires.

The program includes an increase in auditing activities which are used primarily to help ensure that environmental requirements are being meet. The following list identifies the levels of audits;

1) Checklist approach/compliance snapshot
2) Environmental management
3) Risk assessment
4) Pollution Prevention Audits - these audits identify opportunities for pollution reduction and make recommendations for substitution of products.

POLLUTION PREVENTION/RECYCLING EXECUTIVE ORDER

1. **Title**: Executive Order on Pollution Prevention, Recycling, and Procurement.

2. **Purpose**: The Federal Government must assume a leadership role in fostering nationwide attention and activity in the area of Pollution Prevention and Recycling. The Federal Government must also adopt proactive procurement policies to conserve our resources and prevent pollution. The Federal Government can do this in the way it conducts its industrial activities, in the policies it sets, and in everyday government activities.

In the area of industrial activities, it is hereby ordered that each Federal department or agency: incorporate pollution prevention into its various industrial processes, laboratory practices, and maintenance activities; stimulate demand and a market for clean and recyclable/recycled materials by revising procurement specifications and guidelines; and demand that Federal contractors do the same.

With regard to policies, the Federal government must recognize that environmental issues are and must be an integral part of the various missions of the federal government. The Federal government can no longer view our energy, transportation, and agricultural policies as discrete from our long term environmental objectives. They must become instruments of a single goal: the sustainable development of our resources in an ecologically safe way.

In terms of energy, this will require us to pursue policies favoring conservation for the short term, and investigating alternative means of generating and supplying energy for the long term.

In agriculture, the Federal Government must identify policies to assure use of sustainable agricultural methods. In the area of transportation, the Federal Government must espouse policies which retool the nation's automobiles and fuels, encourage reduced dependence on the automobile, and develop more efficient mass transit.

As the single largest consumer in the nation, the Federal Government has the opportunity and the responsibility to move in to the vanguard of solid waste management. This significant challenge will require both reducing the amount of waste that the government produces in the first place, and recycling as much waste as possible.

Recycling does not simply involve separating and collecting waste. It also entails recovering reusable materials, manufacturing products using those materials, and successfully marketing those products.

To make serious inroads into the nation's municipal solid waste capacity crisis, the Federal Government must create market demand for products made with recycled materials in order to stimulate the expansion of the recycling industries infrastructure.

Pursuant to this Executive Order, all federal employees and personnel at Government-owned, contractor operated facilities (GOCO's) are directed to initiate or expand a triad of environmental workplace practices into their daily activities: (1) reduce the quantity and the toxicity of waste at the point of their generation, (2) separate recyclable materials from the waste stream, and (3) procure goods containing recovered materials. Ultimately, the implementation of this Order will benefit tax payers through more efficient use of government resources and through the conservation of natural resources, energy, and scarce waste disposal capacity.

To help federal agencies and GOCOs develop pollution prevention and recycling programs, the Environmental Protection Agency is directed to provide information on the reduction, reuse and the recycling of wastes entering our air, land, and water. A full spectrum of tools are to be used including to the extent feasible assistance in planning, education, incentives, program designs, procurement and specification practices, and program evaluation.

To the extent practicable, government contractors, grantees, and U.S. overseas facilities will be encouraged to implement the practices in this Order.

SECTION ONE: POLLUTION PREVENTION

1.0 The head of each Executive Department or Agency shall incorporate the practice of pollution prevention into internal and external policies, programs, and procedures. The head of each Executive Department or Agency shall assure that its policies, programs, and procedures embrace the hierarchy of environmental management which emphasizes pollution prevention through source reduction first, and then stresses environmentally sound recycling of materials that cannot be reduced or eliminated.

In cooperation with the EPA, federal departments or agencies, facilities, and GOCOs shall develop pollution prevention plans that incorporate the elements and activities provided in this Executive Order, and any other federal statutes addressing pollution prevention including (list TSCA, RCRA, etc).

All federal entities shall work cooperatively with state and local entities charged with development, implementation, and the delivery of pollution prevention programs. Federal agencies can offer resources, serve as models, conduct joint projects, and receive assistance from these entities.

1.1 Each department, agency, instrumentality, GOCO, field and regional office of the federal government shall prepare a Pollution Prevention Plan.

1.2 The Head of each federal department, agency, and GOCO shall be responsible for, and demonstrate commitment to, development of a pollution prevention plan. Plan elements include, but are not limited to:

a. **Pollution Prevention Policy Statement:** A pollution prevention policy statement shall be developed and signed by the Head of each federal department or agency designating principle responsibilities for development, implementation, and evaluation of the plan. This statement also shall include mention of the Department's commitment to incorporate pollution prevention throughout the agency's policies, programs, and procedures; reference plan performance goals **and give primacy to source reduction and address wastes entering the air, land, and water.**

b. **Performance Goals:** The plan shall state goals and objectives and include timelines for completion of any stated goals. Development of numerical prevention goals are recommended. Performance goals may be stated, in lieu of numerical goals, so long as performance goals include activities designed to develop numerical goals as soon as practicable.

c. **Procurement and Acquisition System:** The plan shall ensure that life-cycle costs, long term liability, and other waste management costs are considered in procurement and acquisition decisions. It will also include a review of agency specifications for goods, products and services to assure that environmentally safe alternatives are used and specified to the maximum extent possible. Such a plan shall also incorporate the requirements of section two in this Order

d. **Training Programs:** The plan shall require that employees and management receive adequate training in pollution prevention concepts, techniques, and technologies.

e. **Management Practices:** The plan shall state how pollution prevention will be integrated into the management practices of the federal entity including employee training and orientation, performance appraisals, budgeting and planning procedures, and policies and programs.

f. **Progress Reports:** Federal Agencies and GOCOs shall develop progress reports that include a description of progress toward achieving the pollution prevention/recycling planning goals. Explanation of revised goals and schedules shall be provided if appropriate.

g. Resource Allocation: The plan shall include a description of the revenue and the personnel committed to developing and implementing the pollution prevention plan.

h. Incentive Programs: The plan shall include incentives for employee and management involvement in the implementation of the pollution prevention plan. Such programs may include an awards programs, training opportunities, financial incentives.

i. Recycling: The plan shall incorporate the recycling and procurement provisions stated in Section Two and Three of this Executive Order.

j. Facility Plans: The plan shall include provisions to ensure that federal facilities subject to large quantity generator requirements pursuant to RCRA and/or which produce, import, process, or use 10,000 pounds or more of a chemical subject to the Toxic Release Inventory Reporting requirements of SARA Title III develop facility specific pollution prevention plans that include the planning elements contained in this section. Other facilities are also encouraged to develop pollution prevention plans.

k. Accountability: Within six (6) months of the issuance of this Executive Order each federal agency, including EPA, and each GOCO must designate a Pollution Prevention Coordinator to provide the leadership and the accountability for development and implementation of the plan.

Pollution Prevention Plans shall be developed within two (2) years of the issuance of this Executive Order.

Within ninety (90) days of the issuance of this Executive Order, the Administrator of the Environmental Protection Agency shall designate a Federal Pollution Prevention Ombudsman with whom other federal agency Pollution Prevention Coordinators shall communicate. The Federal Pollution Prevention Ombudsman's principal responsibilities are to:

-**ensure** the development of effective programs pursuant to this Order.

-**promote** the continual progress and refinement of these programs by providing information and linking federal agencies with existing Agency pollution prevention information clearinghouses.

The General Service Administration (GSA) in cooperation with the Pollution Prevention Ombudsman , other EPA offices and OMB shall establish a pollution prevention recycling advocacy office to provide a point of contact to:

-review and provide recommendation for any necessary change in the Federal Acquisition Regulation (FAR) to support and enhance federal specification for and procurement of clean technology, goods and services.

-assist federal agencies and departments develop pollution prevention plans and meet stated goals and objectives.

-collect and maintain data on the types and volumes of materials reduced and/or recycled, associated costs, sources and prices of environmentally clean products and products with recycled constituents, volumes of materials procured with recycled constituents (including percent of recycled constituents by product and quantities of products procured with recycled constituents as a percentage of total procurement).

-provide guidance to assist procuring agencies in promoting the purchase of recycled products, clean technologies and products, and products that maximize energy and/or water efficiency and conservation.

SECTION TWO: SOLID WASTE RECYCLING

2.1 The Head of each federal agency and GOCO is directed to initiate or expand recycling programs in all of its organizational units. These programs must comply with State and local recycling efforts. To the extent practicable, federal agencies and GOCOs are directed to remove from the waste stream: paper, plastic, aluminum, glass, used oil, yard waste, lead acid batteries, and other recyclable materials.

2.2 Revenue generated as a result of source reduction and recycling programs may be retained by the generating agency to support agency pollution prevention programs and agency charitable activities, such as employee scholarship funds and day care centers.

2.3 All federal landholding entities, inclusive of GOCOs, are directed to develop and evaluate plans for increased use of compost on federal lands.

SECTION III: AFFIRMATIVE PROCUREMENT PROGRAMS

3.1 The Head of each federal agency and GOCO is directed to initiate a program, or expand its current program to promote the procurement and use of products made with recovered materials. All federal entities must implement aggressive procurement programs for products containing recovered materials where EPA has developed procurement guidelines. Such a program is to include:

- a preference program;

- a promotion program;
- procedures for obtaining estimates and certification of recovered materials content and for verifying the estimates and certifications; and,
- an annual review and monitoring program.

3.2 Federal Agencies may use a cost differential of up to 10% of the unit price to procure products containing recovered materials. The Office of Management and Budget's Office of Federal Procurement Policy (OFPP), the National Aeronautics and Space Administration (NASA), the General Services Administration (GSA), and the Department of Defense (DOD), are directed to incorporate this cost differential in the Federal Acquisition Regulation. The OFPP must take steps to guide agencies in applying this preference program.

The authorization for this cost differential expires ten (10) from the date of the issuance of this order.

3.3 Federal agencies, GOCOs, state and local agencies, grantees, and contractors using federal funds and spending more than $10,000 per year on an item must comply with EPA procurement guidelines. Federal and other entities that procure smaller amounts of these items in a given year, while not required to comply with Federal guidelines, are strongly encouraged to procure goods made with recycled materials.

3.4 The Office of Management and Budget's Office of Federal Procurement Policy will be jointly responsible with EPA for monitoring federal agency affirmative procurement programs. OMB and EPA will issue joint biennial reports on these programs.

3.5 EPA is directed to accelerate the development of guidelines for procuring additional recycled products. Other federal entities are directed and authorized to develop their own preference programs for recycled products for which EPA has not yet developed guidelines.

SECTION FOUR: PLAN AVAILABILITY

4.1 Plan Review: Each Pollution Prevention Plan prepared pursuant to this Order shall be made available to the general public, and local and state governments during normal working hours and at accessible locations designated by the Head of each federal agency.

Upon a showing satisfactory to the Administrator by the Head of each federal agency or department information may be considered confidential if such information, made public, would divulge information entitled to protection under section 1905 of title 18, United States Code.

Industry Specific
Pollution Prevention
Waste Minimization Audit Manuals

The Pollution Prevention Research Branch of EPA's Office of Research and Development is publishing a series of industry-specific pollution prevention waste minimization guidance manuals. Existing Services for targeted industries are being modified and augmented so that they are comprehensive, nationally applicable guidance documents. By the end of FY 90, seven manuals had been published for the industrial categories designated in the titles provided below, making up the first set of manuals in the series. Eleven more manuals are scheduled for publication in late 1990 and early 1991. Industrial categories that will be addressed and the publication schedule are listed below.

The manuals supplement the EPA's generic waste reduction manual issued in July 1988 titled: *"Waste Minimization Opportunity Assessment Manual."* The identification number for this manual is EPA/625/7-88/003.

Currently Available Audit Manuals

"Guides to Pollution Prevention: The Paint Manufacturing Industry"
EPA/625/7-90/005

"Guides to Pollution Prevention: The Pesticide Formulating Industry"
EPA/625/7-90/004

"Guides to Pollution Prevention: The Commercial Printing Industry"
EPA/625/7-90/008

"Guides to Pollution Prevention: The Fabricated Metal Industry"
EPA/625/7-90/006

"Guides to Pollution Prevention: Selected Hospital Waste Streams"
EPA/625/7-90/009

"Guides to Pollution Prevention: Research and Educational Institutions"
EPA/625/7-90/010

"Guides to Pollution Prevention: The Printed Circuit Board Manufacturing Industry" EPA/625/7-90/007

Schedule for Publication of Additional Audit Manuals (FY 91)

February 1991

- o Photographic Labs
- o Fiberglass Reinforced and Composite Plastics
- o Marine Maintenance and Repair

April 1991

- o Pharmaceutical Preparation
- o Auto Body Repair
- o Automotive Shops and Repair

May 1991

- o Thermal Metal Working
- o Building Construction and Trade
- o Non-Agricultural Pesticide Use

August 1991

- o Precious Metal Reclamation
- o Mechanical Equipment Repair

To Obtain Copies:

Call the EPA Pollution Prevention Information Clearinghouse at 1-800-242-9346 or (202) 382-3000.

**Indian Head Naval
Ordnance Station Workshop**

Directions to Indian Head Naval Ordnance Station

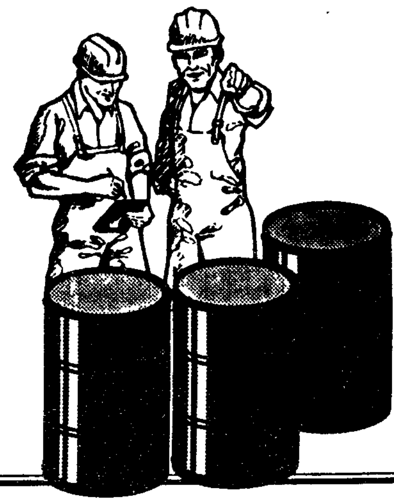
Take I-95 to Exit 3, Indian Head Highway South. Follow Indian Head Highway to the Naval Ordnance Station

Ramada Inn: 301-630-4050 or
1-800-537-1147

Environmental Auditing Workshop For Federal Facilities:

Moving To Pollution Prevention Audits in the 1990's

Indian Head Naval Ordnance Station
Indian Head, MD
September 25-27



Sponsored By the Office of Pollution Prevention and Office of Federal Activities - U.S. EPA

PRELIMINARY FINAL AGENDA
ENVIRONMENTAL AUDITING WORKSHOP FOR FEDERAL FACILITIES: MOVING TO POLLUTION PREVENTION AUDITS IN THE 1990's

Day 1: Introduction to Audits

8:00 - 8:30
Registration

8:30 - 9:45
Introduction: Moving to Pollution Prevention Audits
Jim Edward - EPA Pollution Prevention Office

- Definition of Environmental Auditing
- Summary of EPA's Audit Policy for Federal Agencies
- Elements of Effective Environmental Auditing
- Use of Audits as a pollution prevention tool
- Overview of Pollution Prevention Concepts

9:45 - 10:00
Break

10:00 - 11:30
Elements of a Comprehensive Environmental Auditing Program
Jim Edward - EPA Pollution Prevention Office
Bill Hasselkus - Department of Energy

Considerations for Federal Agency Audit Programs

- Audit Program Design Guidelines
- Audit Program Needs
- Goals, Objectives, and Responsibilities
- Environmental Audit Policy Statement
- Roles and Responsibilities of Personnel
- Organizational Focus of the Audit Program
- Financial Management Issues
- Federal Facility Budget Plans and the A-106 Process
- Disclosure of Audit Information and the Freedom of Information Act

11:30 - 12:45
Lunch

12:45 - 2:15
Protocols and Procedures
Chris Hylemon - Booz, Allen & Hamilton

Generic Protocol for Federal Facility Audits

- Guidance for Developing Agency-specific Protocols
- Audit Team Selection
- Steps in the Audit Process
- Source List
- Check List

2:15 - 2:30
Break

2:30 - 3:45
Audit Skills and Techniques (Break into four audit teams)
Barbara Kuryk - Booz, Allen & Hamilton

Effective Audit Interviewing Skills

- Basic Techniques
- Selecting Audit Team Leaders
- Asking the "Right Questions"
- What to Avoid
- Role Playing Exercise

3:45 - 4:30
Field Audit Preparation Briefing
Jim Edward - EPA Pollution Prevention Office
Chris Hylemon - Booz, Allen & Hamilton

Review of Pre-audit Questionnaire
Conduct In-briefing with Facility Personnel
Distribute Facility Audit Background Materials

- Regulations
- Facility Background Information and Logistics

Day 2: Field Exercise in Environmental Auditing

8:00 - 8:15
Leave Hotels via POV's to Naval Ordnance Station to meet Buses

8:30 - 9:00
Arrival at Facility, Check-in, Security

9:00 - 9:45
Opening Activities
Jim Edward - EPA Pollution Prevention Office

- Facility Overview — Installation Coordinator
- "Mock" In-briefing — Jim Edward - EPA Pollution Prevention Office; Chris Hylemon, Booz, Allen & Hamilton

9:45 - 10:00
Break

10:00 - 12:00
Audit Two Field Stations

Workshop Participants Break into Four Audit Teams to Assess Four Stations, such as the following:

Sewer plant
Production/maintenance operation
Laboratory
Boiler house/incinerator
Landfill
Hazardous waste treatment, storage, disposal
Recycle/reuse facility

Facilitate Group Activities with In-House EPA and Booz, Allen Personnel
Chris Hylemon (BAH), Barbara Kuryk (BAH), Jim Edward (EPA), Jim Hayes (EPA), Jim Bridges (EPA), Kathy Hutson(EPA)

12:00
Lunch (Onsite)

1:15 - 3:15
Audit Two Field Stations

3:30
Bus Back to Naval Ordnance Station/Conference Center

3:45 - 5:00
Post-Audit Activities. Groups Return to Assembly Point and Begin to Develop Findings. Stress Need for Continued Discussion in Evening.

Day 3: Post Audit Activities and Future Directions

8:00 - 8:15
Overview - Recap of the Audit
Jim Edward - EPA Pollution Prevention Office

8:15 - 9:45
Post-Audit Activities. Groups Complete Development of Findings and Prepare for Debrief.
Chris Hylemon - Booz, Allen & Hamilton

9:45 - 10:00
Break

10:00 - 11:00
Debrief of Audit Findings By Groups and Discussion
With Facilitators
Jim Edward - EPA Pollution Prevention Office,
Jim Hayes - EPA Pollution Prevention Office
Kathy Hutson - EPA
Chris Hylemon - Booz, Allen & Hamilton

Findings Presented by each Audit Team Leader

11:00 - 11:30
Pollution Prevention Information Clearinghouse
Kevin Palmer - SAIC

11:30 - 12:30
Lunch

12:30 - 1:45
Pollution Prevention and Waste Minimization Audits
Jim Bridges - EPA Office of Research and Development

Overview of EPA's Pollution Prevention Program

Waste Minimization/Pollution Prevention Opportunity Assessments

Definitions
Programs and program goals
Planning and organization
Assessment phase
Feasibility analysis
Implementation

WREAFS Program
Program Incentives
Tools to Support the Program
Examples

1:45 - 2:45
Property Transfer Environmental Audits
Jim Hayes - EPA Pollution Prevention Office

EPA Report on Current Practices in Property Transfer
Preliminary Guidelines for Property Transfer Audits
Environmental Assessments

2:45 - 3:30
Summary - Future Directions in Environmental Auditing
Jim Edward - EPA Pollution Prevention Office

3:30
Adjourn

Please Submit Course Evaluation Forms at this Time, Thank You!

For Further Information
on any aspect of the PPIC call:

Myles E Morse
Office of Environmental Engineering and Technology Demonstration
(202) 475-7161; FTS 475-7161

or

Priscilla Flattery
Pollution Prevention Office
(202) 245-3557; FTS 245-3557

U S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

or

PPIC Technical Support
Science Applications International Corporation
8400 Westpark Drive
McLean, VA 22102
(703) 821-4800

U S Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

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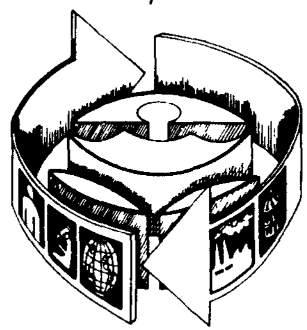
PPIC

The Pollution Prevention Information Clearinghouse

A clearinghouse dedicated to reducing industrial pollutants through technology transfer, education and public awareness



"Promoting pollution prevention through efficient information transfer"

Sponsored by the

EPA

U.S. Environmental Protection Agency

Office of Environmental Engineering and Technology Demonstration

and the

Pollution Prevention Office

June 1989

POLLUTION [illegible]

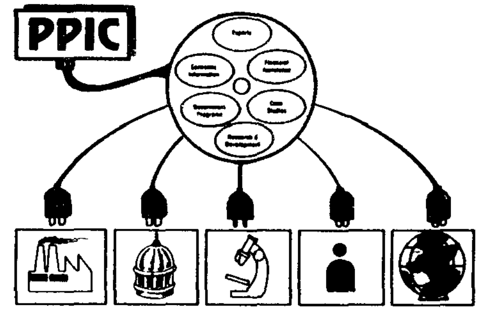
Reducing or eliminat[illegible] emissions to the[illegible] reduction and environm[illegible]

PPIC IS:

- A clearinghouse of technical, policy, programmatic, legislative, and financial information
- A national and international communication network that:
  - — targets multi-media source reduction and recycling opportunities
  - — is accessible by toll free hotline, personal computer, or letter
  - — is easy to use
  - — is responsive to changing user needs

PPIC HELPS YOU:

- Establish government and industry pollution prevention programs
- Identify technical process options to reduce pollution
- LOCATE and ORDER documents
- Identify upcoming events, conferences, training sessions, seminars, and workshops
- Discover grant and project funding opportunities
- Save money by showing you how to REDUCE YOUR WASTE AND REDUCE LIABILITIES



PPIC CONTAINS four information exchange mechanisms to ensure efficient and comprehensive technical and programmatic support:

REPOSITORY - A hard copy reference library containing the most up-to-date information on pollution prevention.

ELECTRONIC INFORMATION EXCHANGE SYSTEM (EIES) - A computerized conduit to information data bases and document ordering accessible by any PC equipped with a modem.

HOTLINE - A free telephone service to answer or refer questions and provide a link to EIES for users without access to a PC.

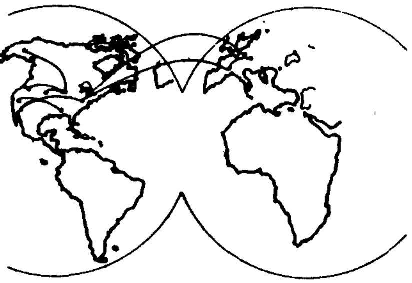
OUTREACH EFFORTS - Information packets containing general and industry-specific materials on prevention opportunities as well as workshop training sessions.

PPIC lets you order documents in one easy step through the EIES or the Hotline. Documents can be printed by your PC or sent by FAX from an on-line library. Inter-library loans can also be arranged.

PPIC helps you save money by relaying information on prevention options such as:

- periodic assessments
- inventory control
- housekeeping and preventive maintenance
- training and supervision
- production planning and sequencing
- process/equipment modification
- materials/product substitution
- waste segregation and separation
- recycling and reuse

PPIC User Network



PPIC gives users on-line access to peers and continuously updated information.

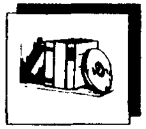
PPIC's network lets you locate cooperative opportunities and avoid duplication of effort.

PPIC's network is designed to foster communication and information transfer among its users in:

Federal, State, local & international governments
industry & trade associations
public/private institutes
public interest groups
academia

Small business can use recovery options where raw materials substitution is not feasible

THE REPOSITORY



PPIC's repository is comprised of a data collection center, the pollution prevention collection in the EPA library, and an on-line information retrieval system. Users can obtain materials through the National Technical Information Service, Center for Environmental Research Information, Public Information Center, and PPIC. The repository contains:

Case Studies:

- Hundreds of waste audits, surveys, and technical documents on specific processes are available.
- Identify pollution prevention options, implementation cost, payback period, dollars saved, and other incentives.

Training & Educational Materials:

- Promote pollution prevention technologies, concepts, applications, and incentives.
- Target corporate management, plant employees, government agencies, and public.

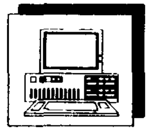
Program & Legislation Review:

- A compilation of successful program, legislative, and policy initiatives at the local, state, and national government levels

Factsheets:

- Identify industry- and process-specific opportunities
- Highlight low- and no-cost options such as housekeeping and preventive maintenance.
- Provide tips on increasing efficiency through inventory control, waste segregation, and sequencing

THE ELECTRONIC INFORMATION EXCHANGE SYSTEM (EIES)



EIES is an easy-to-use, interactive PC-based system designed to provide instant access to information and data bases. EIES is a "one-stop-shopping" resource. With EIES you can

- Access information on-screen
- Download and print information on your own PC
- Automatically FAX information to your location
- Electronically order hard copy documents

EIES Contains:

- A message center
- A directory of experts
- A calendar of events
- Publications
- Case studies
- Program summaries

EIES Can Be Updated By Users:

You may add new information and updates to EIES bulletins and data bases through

- the message center,
- on-line questionnaires, or
- by uploading information in any word processing format

All updates are reviewed by EPA prior to incorporation into the system to preserve data accuracy and quality.

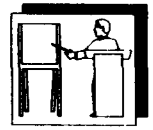
To access EIES, contact the PPIC Hotline for information and a handy "User Guide".

THE HOTLINE
(800) 424-9346
or 1-202-382-3000

PPIC uses the RCRA/Superfund hotline to provide a free telephone service to answer or refer your pollution prevention questions, access information in the PPIC, and assist in document searches and ordering. The Hotline offers

- access to the legislative and scientific expertise of over 25 information specialists
- a non-computerized link to information in EIES for users without a PC

OUTREACH FUNCTIONS



PPIC will target audiences to foster acceptance of pollution prevention solutions. Tools used to spread the word include

General Information Packets:

- general flyers and brochures
- calendar of upcoming events and activities
- program descriptions
- waste assessment manuals
- EIES user manual

Industry-Specific Information Packets

- successful case studies
- process-specific factsheets with information on:
  - available options
  - establishing an in-house program
  - financial savings

User Bulletins - issued periodically by the PPIC to announce:

- new Federal, State, and industry technical information transfer programs
- updates to the EIES and Repository
- funding opportunities
- research and development activities
- technology demonstrations

Conferences and Workshops- enable the PPIC to:

- demonstrate PPIC functions
- expand the pollution prevention network
- collect and distribute new information and ideas

Periodic assessments of your process and inventory can identify areas where pollution can be reduced or eliminated

3.1 STRATOSPHERIC OZONE PROTECTION AND POLLUTION PREVENTION

3.2 ATTACHMENTS

- Outline - Stratospheric Ozone Protection and Pollution Prevention

3.1 STRATOSPHERIC OZONE PROTECTION AND POLLUTION PREVENTION

Elizabeth Creel, Project Manager, Global Planning Change Division, EPA, Headquarters, Washington, D.C.

Ms. Creel discussed the successes EPA has had dealing with stratospheric ozone depletion. The depletion of the ozone layer has presented all of us with an intricate environmental challenge requiring a concerted international effort. The challenge is to modify the production, use and release of chemicals such as CFCs, halons, methyl chloroform, and carbon tetrachloride in a manner which achieves the dual goals of environmental protection and economic efficiency.

Ozone Protection

The 1987 Montreal Protocol on substances that deplete the ozone layer, and the subsequent amendments approved in 1990 in London, is an international agreement that restricts the production and consumption of ozone-depleting chemicals. Under the Montreal Protocol, CFCs and halons must be phased out in industrialized countries by the year 2000 and methyl chloroform must be phased out by 2005.

Here in the United States, the recently amended Clean Air Act contains several provisions pertaining to stratospheric ozone protection. For the most part, the Clean Air Act is even more stringent than the Montreal protocol, since it has a more stringent phase-out schedule for methyl chloroform and many more interim levels of production reductions for CFCs.

Pollution Prevention

The concept of pollution prevention requires the development of cleaner technologies. Pollution prevention is usually achieved through technical measures taken to reduce or even eliminate the production of any pollution or waste at the source, and to reduce the use of energy, raw materials and natural resources. Pollution prevention can be achieved through means as diverse as input or raw material substitution, process modification, improved operation and maintenance of production equipment, production reformation, and recycling.

Finding a solution to ozone depletion offers a good model for pollution prevention by putting regulatory incentives and economic incentives in place. For example, Congress has placed an excise tax on ozone-depleting compounds manufactured or imported for use in the U.S. This tax which is based on each chemical's ozone-depleting potential, increases annually until the phase-out date provides a further incentive to develop and use alternative and substitutes to ozone-depleting substances.

There are many different kinds of impediments associated with promoting pollution prevention. These barriers are structural, economic and technical. However, many of these obstacles have limited applicability in the case of ozone protection. Within the regulated community, there is often the perception that production process changes threaten product quality. However, many firms have already discovered that switching away from ozone-depleting chemicals has enhanced rather than reduced product quality, since it has focused attention on improving production methods. For example, substituting inert gas soldering for CFC-113 as a cleaning solvent has resulted in stronger bonds between components and printed circuit boards.

Another typical impediment is that small and medium-sized firms have limited information about new processes, chemicals and technologies, and thus will be slower to adopt these alternatives. Many of the smaller firms have, however, been among the most innovative in identifying suitable alternatives to ozone-depleting chemicals. For example, Petroferm, a small company in California, was the first firm to identify an alternative to CFC-113 as a cleaning solvent. Their alternative is an aqueous cleaning process based on a biodegradable detergent made from citrus terpenes.

The main economic impediment is the large initial capital outlay to develop an alternative process or substitute chemical. However, shifting away from the use of ozone-depleting chemicals can be justified on the basis of environmental protection and chemical supply reliability. An important component of any economic analysis should be the recognition of the fact that the price of ozone-depleting chemicals will increase rapidly as supplies are reduced and taxes are imposed. Furthermore, the full costs associated with using particular substances may not be taken into account. For example, the United States Army recently made a determination that for every dollar spent on a hazardous material process input, eight to ten dollars is spent to manage and dispose of the wastes generated by the original substance.

The primary technical obstacle is that small and medium-sized firms may not have access to sufficient technical expertise, information, or assistance. In the case of ozone protection, many of these firms have developed their own means of eliminating emissions of ozone-depleting chemicals through improved conservation and recycling. For example, Separation Technologies, a Boston-based firm, has developed a technology based on closed-loop solvent recycling which eliminates any direct discharge of wastes to waterways.

The proposed methodology for prevention of ozone depletion involves adapting a preventive holistic approach, understanding plant operations, characterizing process needs, and developing integrated design teams. There are already many success stories that can illustrate how the concept of pollution prevention can be integrated with efforts to protect the ozone layer. Industry experience has now shown that by carefully evaluating and selecting components and assembly processes, benign low solids fluxes can be used to eliminate cleaning in some cases. This so-called "no-clean" alternative was only discovered through an intensive investigation of the production process.

These examples illustrate that the success of ozone-depleting chemical reduction and elimination strategies will depend upon how effectively elimination programs can be organized. The development and implementation of substitute chemicals and alternative process technologies presents a demanding challenge. The rewards for success are the contribution to global environmental protection and the increase in industrial efficiency.

Outline - Stratospheric Ozone Protection and Pollution Prevention

A. Ozone Protection
   1. Montreal Protocol Amendments
   2. Clean Air Act Amendments

B. Pollution Prevention
   1. Definition
   2. Common Sense Approach

C. Promoting Pollution Prevention
   1. Ozone depletion offers a good model for pollution prevention approach
   2. Regulatory incentives
   3. Economic incentives

D. Applying Pollution Prevention to Ozone Protection
   1. Special circumstances
      a. International Consensus
      b. Community Spirit
   2. Less emphasis on waste streams
   3. Stringent phase-out regulations

E. Impediments
   1. Three categories: structural, ecomonic, and technical
   2. Less applicable to ozone protection
   3. Structural
      a. Product quality
      b. Availability of information
   4. Economic
      a. Capital outlay
      b. Assessment of full cost
   5. Technical
      a. Availability of expertise

F. Proposed Methodology
   1. Adopt preventive and holistic approach
   2. Understand plant operations
   3. Characterize process needs
   4. Develop integrated design team

G. Successful Examples of Pollution Prevention
   1. "No-clean" alternative
   2. Halon testing

H. Conclusions

1. Ozone protection offers model for pollution prevention
2. Need to integrate pollution prevention principles with ozone protection efforts
3. Development and implementation of substitute chemicals/alternative technologies is a challenge
4. Rewards for success = global environmental protection and increase in plant efficiency

4.1 THE COMPREHENSIVE HAZARDOUS MATERIALS MANAGEMENT PROGRAM

4.1 THE COMPREHENSIVE HAZARDOUS MATERIALS MANAGEMENT PROGRAM

W. Joseph Hoenscheid and Walker Beddos, Regulated Property Disposal Office, Defense Logistics Agency

Abstract

Until 1986, the Defense Logistics Agency (DLA) had a number of individual programs dealing in varying degrees with the management of hazardous material and hazardous waste. Each program was very worthwhile and commendable in its own right. However, these were individual efforts, often lacking agency-wide visibility and central direction. To provide a coordinated approach to hazardous material and hazardous waste management within DLA, a task group consisting of representatives of the cognizant DLA Directories developed the (CHAMMP) - the basis for continued management efforts in this arena. The task group took a "life cycle" approach in developing the Program. The six phases in the life cycle of DLA managed hazardous property are:

- Determination of requirements
- Design
- Acquisition
- Supply systems (that is, how the hazardous material is transported, stored, issued, etc., by our Defense Depots)
- Consumer use (DLA) - This phase deals with how hazardous material is used within DLA itself
- Disposal

CHAMMP has been incorporated into the DLA Strategic Plan and provides for the continued "cradle to grave" management of DLA controlled hazardous property. It is a "living plan", reviewed and revised on a continuing basis to meet the changing environmental challenges. This briefing elaborates on each of the phases of the plan.

Presentation

The Defense Logistics Agency's business is support - specifically, furnishing material support and services to the military. If the U.S. military forces fight with it, eat it, wear it, burn it (fuel, that is), push its buttons, or use it to carry out any of a thousand tasks related to combat readiness, chances are that DLA buys, stores and ships the item to the Military Services. We manage more than 2.8 million supply items in all, and each shares a common trait; whether pasta or spare part, each item is a consumable.

Our cradle-to-grave material support role starts at the pre-design phase and continues throughout the life of the product until, eventually, we dispose of items no longer needed by the

Services. During this process, DLA continually emphasizes total quality management, which stresses quality throughout the production cycle. Some 50,000 civilian personnel and 1,000 military, engaged in a wide variety of occupations and skills, carry out DLA's logistics responsibilities at facilities that span the globe.

To assure the support essential to readiness, DLA uses an array of technical, administrative, and managerial skills ranging from computer programming to mechanical engineering. Whatever the occupational specialty, our work force applies its expertise in supporting the Military Services by:

- Buying and providing quality goods,
- Administering contracts, and
- Performing technical and logistics services.

The Department of Defense (DoD) components use some 4.8 million national stock numbered items. The growing inventory of commodities that we manage - spare parts, clothing, fuel, food, medical and construction supplies - represent 69 percent of all items used by the armed forces. While only a small portion of these items are considered hazardous materials, they require close and continued attention to comply with environmental mandates, assure the safety of those personnel that handle them and preclude environmental degradation.

It's difficult to pick up a newspaper, magazine, turn on the TV, even listen to the radio today without being exposed to some reference to the environment. If the commentary doesn't address new legislation or costly compliance, it all too often concerns instances of damage to the environment. In some cases the damage is alleged to be the fault of a federal facility or that of an activity of the DoD. The environmental authorities, as well as the special interest groups, are quick to point where we may have failed.

The recent Defense Environmental Restoration Program annual report to Congress cited two significant quotes that emphasize the importance the Administration places on environmental compliance. From the 1988 Presidential campaign, the statement by President Bush that "Federal facilities should lead the way in environmental compliance"; and from Secretary of Defense Cheney on 10 October 1989 "...this Administration wants the United States to be the world leader in addressing environmental problems and I want the Department of Defense to be the Federal leader in Agency environmental compliance and protection."

The continuous oversight by Congress, the General Accounting Office, the Inspector General, the Department of Justice, the Environmental Protection Agency and the environmental authorities of the states, coupled with the heightened environmental awareness of a sensitive public, challenges us to examine the way we do business and seek constant improvements in the management of hazardous commodities. The Comprehensive Hazardous Materials Management Program, or CHAMMP, is part of the DLA effort to address those challenges.

Up until 1986, DLA had a number of programs and initiatives involved with the management of hazardous material and hazardous waste. However, these programs and initiatives were instituted and managed exclusively by the affected functional element. For instance, the Directorate of Supply Operations had several ongoing programs at the Defense Supply Centers and Depots which dealt with packaging and transportation of hazardous material stocks; safety and health professionals with the Office of Installation Services and Environmental Protection were implementing programs at the DLA field activities in conjunction with the OSHA Hazardous Communication Standard; the Defense Reutilization and Marketing Service in Battle Creek, Michigan, was proceeding with various hazardous waste disposal initiatives; and so forth. Each of these initiatives was very worthwhile and commendable in its own right; however, these individual efforts, driven by diverse requirements, often lacked agency-wide visibility and were frequently being pursued without central coordination or direction.

To provide a coordinated approach to hazardous material and hazardous waste management within DLA, the Director designated the Director of Technical and Logistics Services as his Executive Agent. Under this authority, a task group of representatives of the cognizant DLA Directorates was convened to develop a DLA Comprehensive Hazardous Materials Management Program - the basis for continued management efforts in this arena.

The task group took a "cradle-to-grave" approach in developing the program. This chart shows the six phases in the life cycle of DLA-managed hazardous property that were identified:

- Determination of requirements
- Design
- Acquisition
- Supply systems (that is, how the hazardous material is transported, stored, issued, etc., by our Depots)
- Consumer Use (DLA) - This phase deals with how hazardous material is used within DLA itself,
- Disposal.

Within each of the six life cycle phases, we identified one or more subphases or actions. A total of 26 subphases are incorporated into the program.

The task group then made a complete review of all the Principal Staff Element (PSE) hazardous property management responsibilities and actions. We noted a great deal of duplication or contradiction of effort. An example of this is in the area of training. We discovered that our supply operations people were developing and providing hazardous materials handling training for their Defense Depot stock-handlers completely independent of the similar training being developed and conducted by the Defense Reutilization and Marketing Service for its hazardous property disposal personnel.

The task group rolled all these hazardous property management responsibilities into the program with an eye to eliminating duplications or contradictions. Continuing with the training example I just mentioned, we established an initiative whereby development of all hazardous property-related training courses is reviewed annually to preclude unnecessary duplication.

The "meat of the program", however, is in its Hazardous Material Management Initiatives, or HMMIs. Offices of Primary and Collateral Interest (OPI/OCI) are assigned to each one. Some of the HMMIs have joint action within DLA; that is, two or more DLA Directorates are involved.

The DLA OPIs have developed implementation plans for each HMMI. These implementation plans identify milestone actions and target dates for completion of those actions. At the present time we have 90 HMMIs identified with a total of 254 separate milestone actions.

The program is reviewed by the PSE representatives and is briefed to the Director of Deputy Director on a periodic basis.

As this is a "living-plan", new initiatives are introduced as others are completed or revised. Recent review of the program increased the number of initiatives from 59 to the current total of 90. As the program embraces the life cycle management of HM for DLA it has been incorporated intact into the DLA Strategic Plan. Due to the number of HMMIs, rather than discuss each individual initiative, we will discuss their overall objectives in each phase of the program.

PHASE I - DETERMINATION OF REQUIREMENTS. This phase is not viewed as a DLA responsibility, but is seen in the context of when the DoD component perceives the need for a product or system. However, we saw an opportunity to reduce hazardous waste at the end of the life cycle of hazardous property by minimizing the inclusion of hazardous materials at the front end of the life cycle in the requirements planning process. Thus, the Directorate of Contracting (DLA-P) has completed an initiative to make a change to the DoD Supplement to the Federal Acquisition Regulations (DFARs) to require planners to minimize the inclusion of hazardous materials in their requirements determinations. A formal case was first presented to the DAR Council in January 1988. However, action was deferred by the DAR Council for lack of formal DoD environmental guidance to sanction change to the Acquisition Regulations. Upon publication of DoD Directive Number 4210.15 on Pollution Prevention, the case was resubmitted in September 1989 and has resulted in January 1990 coverage in the Acquisition Regulations. This will mandate DoD-wide consideration of hazardous material minimization objectives for all new major acquisition requirements at the front end of the process.

PHASE II - DESIGN. In the design phase we have identified ten initiatives that fall within the five subgroups shown on the chart.

Our Engineering initiatives consider minimization of hazardous materials through revision of specifications, materials substitution, specification evaluation criteria and manufacturing processes.

In Research and Development, we have an initiative to coordinate with and influence the Military Services to minimize the use of hazardous material in their systems as they are designed and modified.

In Specifications, we are incorporating hazardous property requirements in training courses for preparation of acquisition specifications.

We have initiatives to improve Packaging Specifications to prolong or eliminate shelf-life, and to revise preservation, packaging, packing and marking requirements to ensure adequate protection during transportation and storage.

Product Identification actions consider the application of item reduction, interchangeability and substitutability programs to reduce the number of hazardous items in the DoD inventory and the number of items that become hazardous on expiration of shelf-life.

PHASE III - ACQUISITION. In the acquisition phase we identified five initiatives.

We are reviewing Solicitations for procurement specifications, material standards, and purchase description criteria to ensure that shelf-life items have a minimum of 85 percent shelf-life at time of delivery.

As an adjunct to the DAR Council case I mentioned a moment ago, we have a joint action with OSD which seeks to introduce Source Selection criteria into the acquisition regulatory procedures which would favor suppliers who use hazardous property minimization processes.

In Contracting, the Defense General Supply Center in Richmond, Virginia, is utilizing and evaluating the results of a contract clause covering hazardous material inspection and acceptance which allows contractors to be charged DLA costs to correct or dispose of improperly contractor-packaged shipments.

We have established a Quality Assurance initiative to upgrade contract requirements as needed to include origin inspection for shipments to Depots; review of sampling procedures; judicious use of certificates of conformance; and use of quality assurance letters of instruction.

Contract Administration efforts are establishing specific controls to ensure contract compliance for labeling, packaging and quality assurance.

PHASE IV - SUPPLY SYSTEMS. There are currently 22 HMMIs in the supply systems phase with eight new ones under development.

LIFE CYCLE OF DLA-MANAGED HAZARDOUS MATERIALS

I DETERMINATION OF REQUIREMENTS	II DESIGN	III ACQUISITION	IV SUPPLY SYSTEMS	V CONSUMER USE (DLA)	VI DISPOSAL
• Planning	• Engineering	• Solicitation	• Supply Management	• Waste Minimization	• Program Policy
	• Research & Development	• Source Selection	• Depot Procedures		• Receipt
	• Specifications	• Contracting	• Packaging & Transportation		• Reutilization Transfer and Donation
	• Packaging Specifications	• Quality Assurance	• Space Management		• Sales
	• Product Identification	• Contract Administration	• Quality Control		• Ultimate Disposal Programs
			• Training		• Special
			• Safety & Health		• Facilities

In Supply Management, actions include review of procedures in the materials returns program to monitor system abuse from the return of unusable material and identify offenders back to the Military Services. An initiative addresses procedures to minimize hazardous waste generations through central management of hazardous materials. The DLA suggestion program encourages input from all levels of hazardous property involvement by making recommendations at regularly scheduled personnel management surveys.

Depot Procedures call for review of procedures to expedite processing of items in not-ready-for-issue condition.

Under Packing and Transportation, procedures have been established for correcting deficient or nonconforming packing. This initiative provides for immediate repackaging by the Depot, expedited follow-up actions by the Defense General Supply Center (DGSC), Quality Assurance Representative (QAR), Contracting Officer, and notification to the contractor. Also addressed is an initiative to assure that hazardous materials are received from the manufacturer packaged in compliance with contracting requirements.

We are developing a list of preferred packaging and containers for hazardous property managed or stored by DLA. We have developed a plan to implement the United Nations Performance Oriented Packaging (effective date - January 1991).

In Space Management, we have reviewed and revised storage systems for maximum space utilization (through adjustable pallet racks, etc.), and identified a method for DSCs to review, forecast, and adjust stockage levels to meet storage segregation and facility requirements.

In the area of Quality Control, we have established procedures for Depot surveillance inspectors to monitor specific hazardous material storage requirements (e.g., segregation protection).

Under Training, we have standardized hazardous material packaging training to appropriate Depot receiving personnel and QARs. We have implemented a mandatory hazardous materials handling certification training program for Depot personnel. We have reviewed the ongoing training programs and the development of training to preclude unnecessary duplication of DLA training efforts.

In the area of Safety and Health, we are pursuing resolution of problems related to the refinement of the Hazardous Materials Information System (HMIS). We have developed initiatives to ensure implementation of the OSHA Hazard Communication Standard as well as the implementation of OSHA hazardous waste operations and emergency response requirements. We have also evaluated acquisition programs, major facilities, and process changes to determine if system safety applications were necessary.

PHASE V - CONSUMER USE. Consumer use in DLA is addressed in our Waste Minimization programs. Programs have been established to provide Primary Level Field Activities (PLFAs) with direct assistance in the development and implementation of waste minimization programs to comply with the Resource Conservation and Recovery Act (RCRA). This plan calls for PLFAs to establish waste minimization committees, and provides DoD Headquarters DLA technical assistance teams to visit field activities to develop site specific waste minimization plans. We are considering an additional HMMI regarding decentralization of funding for hazardous waste disposal to the field activity level.

PHASE VI - DISPOSAL. This brings us to the final phase - Disposal. To ensure that environmental safeguards are incorporated into all phases of the disposal program, the phase has been recently revised to include a total of 40 HMMIs that address overall policy, receipt of hazardous property at our disposal yards, screening and sales of hazardous property, contracting for disposal, conforming storage facilities, and special categories of hazardous materials, such as medical items, precious metals, and ammunition boxes.

Under Program Policy the CHAMMP has been incorporated into the DLA Strategic Plan. One of our key initiatives is to incorporate the environmental leadership goals outlined by the Deputy Assistant Secretary of Defense (Environment) last fall as they pertain to hazardous property disposal. These goals include: cultural change, compliance, people, organizational structure, budgeting, training, communications and public affairs, and regulatory climate. Other initiatives concern the revision of the Federal Property Management Regulation, the Defense Utilization and Disposal Manual, and revision of guidance on handling third party disposal sites.

Receipt initiatives address training, storage requirements, hazardous material identification and turn-in requirements.

Under Reutilization, Transfer and Donation, we have initiatives to include liaison with state and federal agencies to better identify hazardous materials offered for their further use, review disposal program policy with GSA and tightening controls on hazardous property issued to screening customers.

Under Sales, emphasis is on efforts to ensure that procedures for conducting national sales emphasize environmental safeguards, including procedures to determine whether prospective purchasers are environmentally responsive. Our surveillance program, which has been used exclusively to monitor our ultimate disposal contractors, has been expanded to include hazardous materials and waste use and disposition by our sales purchasers. We also have an action to promote the DoD recycling program.

In the area of our Ultimate Disposal contracting, we are reviewing our contracts to ensure that they are written to result in environmentally safe and legally compliant hazardous waste disposal.

Also, we are exploring alternatives for reducing contract disposal costs through implementation of alternate disposal procedures such as use of DoD facilities (IWTPs, incinerators), on-site treatment by contractors (used oil, solvents, PCBs), mobile incineration, and changes to contract specifications (RCRA, non-RCRA). We have provided for long-term contracts (multi-year through use of options). We are revising our retrograde procedures in conjunction with OASD and CINCPAC in order to facilitate the retrograde of PCBs in Japan. In this regard, we have an initiative to gain EPA approval to retrograde U.S. owned foreign manufactured PCB items for ultimate disposal action. We have begun to perform liaison with industry and the Military Services to discuss common management efforts and initiatives, and to learn more of their capabilities as well as provide information on DLA HMMIs.

Under Special Programs, 2 HMMIs address environmental consideration in the precious metals recovery program. Federal Supply Class 6505 medical items are receiving special attention for DLA disposal mission assumption. This does not include infectious or pathological waste.

Finally, our Facilities planning actions provide for evaluation of alternatives to construction of conforming storage facilities to include portable facilities, shared facilities and continued 90-day hazardous waste removal.

In Summary, the DLA plan has been presented to the Deputy Assistant Secretary of Defense for Environment and accepted as a landmark effort for life cycle hazardous materials management and waste minimization. It has been presented to the Military Services at the Departmental level and to other federal agencies. The recent revisions to the initial program increased the management initiatives from 59 to 90 with additional actions under consideration; and the program, in total, has been incorporated into the DLA Strategic Plan.

The development of the program has been a challenging process and has indeed been a "learning exercise" for all who have been involved. It has provided opportunities for the key DLA players to gain a better appreciation of the varied roles that the PSEs play in the management of DLA hazardous property, the specific problems activities deal with, as well as the common problems we share.

5.1 WORKSHOP A: REFRESHER COURSE ON TSCA PCB CONTROL REQUIREMENTS

5.2 ATTACHMENTS

- PCB Transformers in Service
- PCB Transformers Removed
- PCB Transformer Visual Inspection Log
- PBC Transformer Flowchart
- PCB Transformer Disposal and Electrical Protection Requirements
- Decontamination Requirements for Spills

5.1 WORKSHOP A: REFRESHER COURSE ON TSCA PCB CONTROL REQUIREMENTS

Charlene Harrison, PCB Coordinator, TSCA Enforcement Section, EPA Region III.

Ms. Harrison presented basic information on PCB regulations, including storage and disposal, and a summary of the new PCB fire rule. A case study was also presented and discussed. The following is a summary of important points made during the presentation.

The purpose of EPA PCB Transformer Disposal and Electrical Protection requirements is to reduce fire-related risks posed by the use of these transformers. The EPA issued the final PCB Transformer Fire Rule in the Federal Register on July 17, 1985 (50 F.R. 29170). The amended PCB transformer rule was issued in the Federal Register on July 19, 1988 (53 F.R. 27322)

The handling of PCB waste has also been revised. Revisions to PCB control requirements now make it illegal to deliver or receive PCB waste without a manifest. Copies of manifests should be retained for at least three years. As of April 4, 1990, disposers of PCB waste have to submit a one year exception report if waste received from a generator has been removed from service for more than nine months. The purpose of this regulation is to encourage generators of PCB waste to give disposers a reasonable amount of time to dispose of material within the one year requirement. Additionally, disposers are required to submit a certificate of disposal to generators.

PCB Transformers in Service at the End of 19___

Location	Serial Number	Manufacturer	Tradename or PCB Concentration (ppm) of Dielectric Fluid	Volume of Dielectric Fluid (gal.)	Weight of PCB Dielectric Fluid in Transformer (kg)

Totals:	Number of PCB Transformers		Weight

Use additional sheets if necessary. This form is provided only as an example. Use of this form is not required by the PCB Rule, but proper completion of this form will aid in your complying with the PCB Rule. You should be familiar with the entire PCB Rule before completing this form.
EPA Region III TSCA Enf Sec Rev 3/9/90

PCB Transformers Removed from Service for Disposal in 19___

Serial Number	Manufacturer	Tradename or PCB Concentration (ppm) of Dielectric Fluid	Volume of Dielectic Fluid (gal.)	Weight of PCB Fluid in Transformer (kg)	Manifest Number (5 digits)	Date Removed from Service for Disposal	Date Placed into Transport for Off-site Storage/Disposal	Date Off-site Receipt Confirmed	Confirmation of Off-site Receipt (include facility representative and storer/disposer representative)	Date of Disposal
Totals: Number of PCB Transformers				Weight (kg)						

Use additional sheets if necessary. This form is provided only as an example. Use of this form is not required by the PCB Rule, but proper completion of this form will aid in your complying with the PCB Rule. You should be familiar with the entire PCB Rule before completing this form.
EPA Region III TSCA Enf Sec Rev 3/9/90

PCB Transformer Visual Inspection Log

Facility ______________________ City ______________ State ______

Transformer Location ______________ Manufacturer __________ Serial Number __________

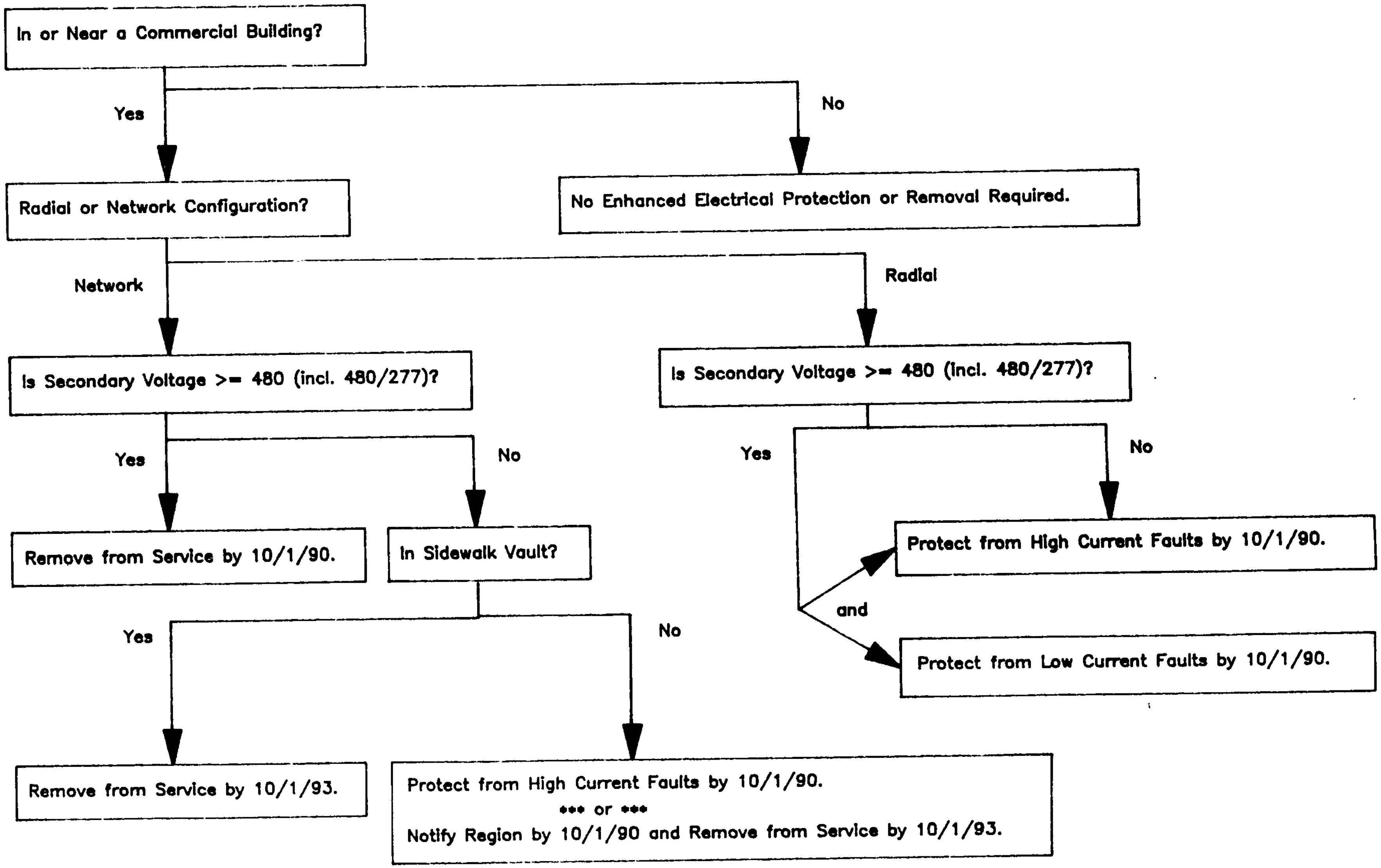
Dielectric Type ______________________ Dielectric Weight (kg) __________

Date*	Leakage no	Leakage yes**	Amount of Fluid Leaked	Location of Leak(s)	Corrective/Containment Actions and Dates	Inspector Name

* Quarterly visual inspections normally required. Annual visual inspections required if transformer has secondary containment for 100% of the dielectric fluid *or* if the transformer contains less than 60,000 ppm PCBs. See 40 C.F.R. Section 761.30 (a)(1)(ix), (x), (xii) and (xiii).

** If fluid is running off or about to run off the unit initiate cleanup within 48 hours. Contain leak and conduct daily inspections (see reverse). (Continued on reverse.)

Is Enhanced Electrical Protection or Removal Required for a PCB Transformer?



PCB Transformer Disposal and Electrical Protection Requirements

The Environmental Protection Agency (EPA) issued the Final PCB Transformer Fires Rule in the Federal Register on July 17, 1985 (50 F.R. 29170). The EPA issued the Amended PCB Transformer Fires Rule in the Federal Register on July 19, 1988 (53 F.R. 27322). These rules regulated the use of PCB Transformers in an effort to reduce fire-related risks posed by the use of these transformers. The EPA mandated some PCB Transformers located In or Near Commercial Buildings* be removed and others In or Near Commercial Buildings be equipped with electrical protection. The following table summarizes these requirements which are codified at 40 C.F.R. Section 761.30(a)(1)(ii)-(v).

Type of PCB Transformer In or Near Commercial Buildings	Secondary Voltage	Fires Rule Requirements
Network**	>=480 or 480/277	Reclassify, store for disposal or dispose of by October 1, 1990
Network in Sidewalk Vault	<480	Remove from service by October 1, 1993
Network not in Sidewalk Vault	<480	Equip with current-limiting fuses or equivalent technology by October 1, 1990 or Notify EPA Region of the location, address and identification number of PCB Transformers not equipped with current-limiting fuses by October 1, 1990 and remove from service by October 1, 1993.
Radial***	>=480 or 480/277	Equip with current-limiting fuses or equivalent technology and

		protection to avoid transformer ruptures caused by sustained low-current faults by October 1, 1990
Radial	<480	Equip with current-limiting fuses or equivalent technology by October 1, 1990

* In or Near Commercial Buildings is defined at 40 C.F.R. Section 761.3 as:

> within the interior of, on the roof of, attached to the exterior wall of, in the parking area serving, or within 30 meters of a non-industrial non-substation building. Commercial buildings are typically accessible to both members of the general public and employees, and include: (1) Public assembly properties, (2) educational properties, (3) institutional properties, (4) residential properties, (5) stores, (6) office buildings, and (7) transportation centers (e.g., airport terminal buildings, subway stations, bus stations or train stations).

** Network transformers can be energized from the either the primary winding or the secondary winding. The secondary winding is the winding from which energy flows in normal operation. In these units the primary winding can be energized from the secondary winding under abnormal conditions. (50 F.R. 29177)

*** Radial transformers can be energized only from the primary winding. (50 F.R. 29177)

DECONTAMINATION REQUIREMENTS FOR HIGH CONCENTRATION SPILLS, & LOW CONCENTRATION SPILLS INVOLVING $\geq$ 1 LB. PCBs

TYPE OF CONTAMINATED ITEM			CLEANUP STANDARDS PER ACCESS AREA		
			Nonrestricted Access Areas	Restricted access areas, other than Electrical Substations	Outdoor Electrical Substations
Impervious Solid Surfaces	outdoor	high contact	10 ug/100 cm^2	10 ug/100 cm^2	100 ug/100 cm^2
	outdoor	low contact	10 ug/100 cm^2	100 ug/100 cm^2	100 ug/100 cm^2
(includes metals, glass, siding & laminated surfaces)	indoor	high contact	10 ug/100 cm^2	10 ug/100 cm^2	
	indoor	low contact	10 ug/100 cm^2	10 ug/100 cm^2	
Nonimpervious Solid Surfaces	outdoor	high contact	10 ug/100 cm^2	10 ug/100 cm^2	100 ug/100 cm^2
	outdoor	low contact	10 ug/100 cm^2 *	100 ug/100 cm^2	100 ug/100 cm^2
(includes wood, concrete, asphalt & plasterboard)	indoor	high contact	10 ug/100 cm^2	10 ug/100 cm^2	100 ug/100 cm^2
	indoor	low contact	10 ug/100 cm^2	10 ug/100 cm^2 *	100 ug/100 cm^2
Soil			10 ppm, minimum depth of 10" and site restored **	25 ppm	25 ppm or 50 ppm provided a notification of cleanup level is visibly posted
Replaceable Household Items			properly disposed of		

* Or cleaned to 100 ug/100 cm^2 and encapsulated.

** Restored means to replace will clean soil, i.e. containing less than 1 ppm PCBs.

All spills involving 10 pounds or more of pure PCB material must be reported to the National Response Center (1-800-424-8802).

For guidance contact the appropriate EPA regional office (in PA, MD, DE, VA, WV, and DC call 215-597-4651/7668). All spills involving surface water, sewers, drinking water, grazing land, or vegetable gardens must be reported to the appropriate EPA regional office.

DECONTAMINATION REQUIREMENTS FOR LOW CONCENTRATION SPILLS INVOLVING < 1 LB. PCBS, OR LESS THAN 270 GALLONS OF UNTESTED MINERAL OIL

TYPE OF CONTAMINATED ITEM		CLEANUP STANDARD
* Solid Surfaces	indoor residential	10 ug/100 cm^2
	other	double wash, rinse
* Soil		All soil with visible spill traces within the spill area plus a foot buffer is to be removed, and site restored. **

* All cleanup must be completed within 48 hours after the responsible party was notified or became aware of the spill.

** Restored means to replace with clean soil, i.e. containing less than 1 ppm PCBs.

6.1 WORKSHOP B: THE NEW HAZARD RANKING MODEL

6.2 ATTACHMENTS

- The Superfund Process
- Number of Region III Federal Facilties
- Pre-Remedial Work at Region III Federal Facilities
- Region III Federal Facilities on the NPL
- NPL Activity
- Revised HRS
- Region III Docket Facilities by State
- Region III Docket Facilities by Agency

6.1 WORKSHOP B: THE NEW HAZARD RANKING MODEL

Henry Sokolowski, Chief CERCLA Federal Facilities Section, EPA, Region III.

Mr. Sokolowski reviewed federal laws that regulate Federal Facility Hazardous Waste Management (RCRA Section 6001, Executive Order 12580 and CERCLA Section 120). Additionally, he presented the new Hazard Ranking Model including a description of the changes and how they could affect a site.

RCRA Section 6001 applies to any federal facility that controls a solid waste management facility, a disposal site or engages in any activity involving disposal or management of solid waste or hazardous waste. Section 6001 includes requirements of permits and reporting and requires federal facilities to comply with federal, state, interstate and local requirements. Executive Order 12580 delegates authority to federal agencies to implement certain provisions of CERCLA. CERCLA section 120 states that the provisions of CERCLA apply to federal facilities to the same extent as any nongovernmental entity. It also establishes a schedule for evaluating and cleaning up federal facilities. The superfund process under CERCLA section 120 is outlined in the following attachments.

The new Hazard Ranking System (HRS) used by EPA to evaluate preliminary assessment and site investigations became effective as of February 9, 1990. The HRS is used to score each facility to determine whether they will be added to the NPL list. If a facility is already on an NPL list they will not be affected by the new HRS. Mr. Sokalowski identified Region III federal facilities that are used on the NPL (see following attachments).

Soil has been added as the fourth exposure pathway in the revised HRS in addition to groundwater, surface water and air. The surface water pathway evaluation has been modified to include a number of sensitive environments including fisheries, recreation areas, wetlands and endangered species habitats. For each pathway, an evaluation is made of the likelihood of release at a particular site, waste characteristics and the target population or target sensitive environments. In general, the new HRS is more complicated than the old version. Under the revised HRS, new facilities may score higher than existing NPL listings.

The Superfund Process

- CERCLA Section 120 requires that Federal facilities complete a PA and/or SI within 18 months of docket listing
- EPA evaluates PA/SI adequacy in light of the Hazard Ranking System (HRS) criteria
- EPA scores the facility using the HRS
- If score is above 28.5, the facility is proposed for the NPL
- EPA receives and evaluates comments on proposed NPL listing
- Final NPL is published
- NPL updates occur every 6 months
- IAG developed for NPL sites
- RI/FS and other cleanup activities proceed in accordance with the NCP and other conditions specified in the IAG

Number of Region III Federal Facilities

- 2,214 installations in Region III meet EPA definition of Federal facility
- Of these installations:

  - 362 handle hazardous waste

  - Approximately 250 qualify as major or significant sources
    Size
    Process
    Program Classification
    History

  - 142 are listed on the docket

  - 39 are TSDFs under RCRA

  - 7 are on the NPL (9 listings)

Pre-Remedial Work at Region III Federal Facilities

- 89 facilities on the docket have submitted PA/SI reports (or equivalent)
- 78 facilities have received notice that the PA//SI is deficient
- Docket facilities as of March 1989 should have completed PA/SIs
- Facilities are encouraged to being work on PA/SIs before docket listing

Region III Federal Facilities on the NPL

- Letterkenny (PDO) - IAG FY88
- Letterkenny (SIA) - IAG FY88
- Dover AFB - IAG FY89
- West Virginia Ordnance Works - IAG FY89
- Aberdeen (Michaelsville) - IAG FY90
- Aberdeen (Edgewood) - IAG FY90
- Naval Air Development Center - IAG FY90
- Defense General Supply Center - IAG FY90
- Tobyhanna Army Depot - IAG FY90

NPL Activity

- Records of Decision (RODs)
  - 5 in October 1990
  - 7 in FY91 (10/90-9/91)
  - 10 projected for FY92
  - 11 projected for FY93
  - 4 projected for FY94
  - 2 projected for FY95
  - 1 projected for FY96
- Remedial Design (RD) Starts

- 9 in FY91
- 13 in FY92
- 11 in FY93
- 6 in FY94
- 2 in FY95
- 1 in FY96

- Remedial Action (RA) Starts
  - 3 in FY90
  - 4 in FY91
  - 5 in FY92
  - 15 in FY93
  - 10 in FY94
  - 7 in FY95
  - 2 in FY96

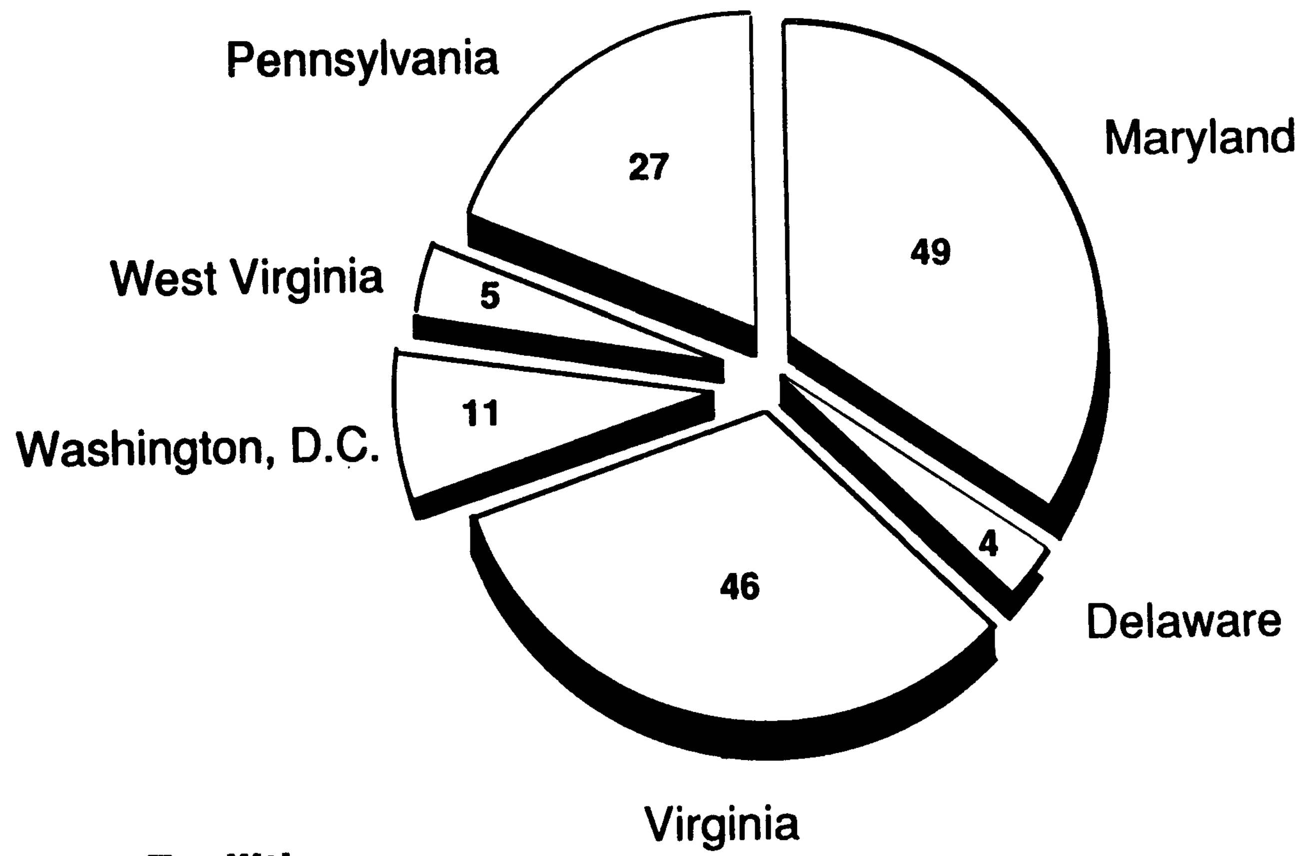
<u>Revised HRS</u>

- Much more complicated
  - Proposed rule is 323 pages versus 80 in old rule

- 4 primary exposure pathways evaluated
  - Ground water
  - Surface water
  - Soil
  - Air

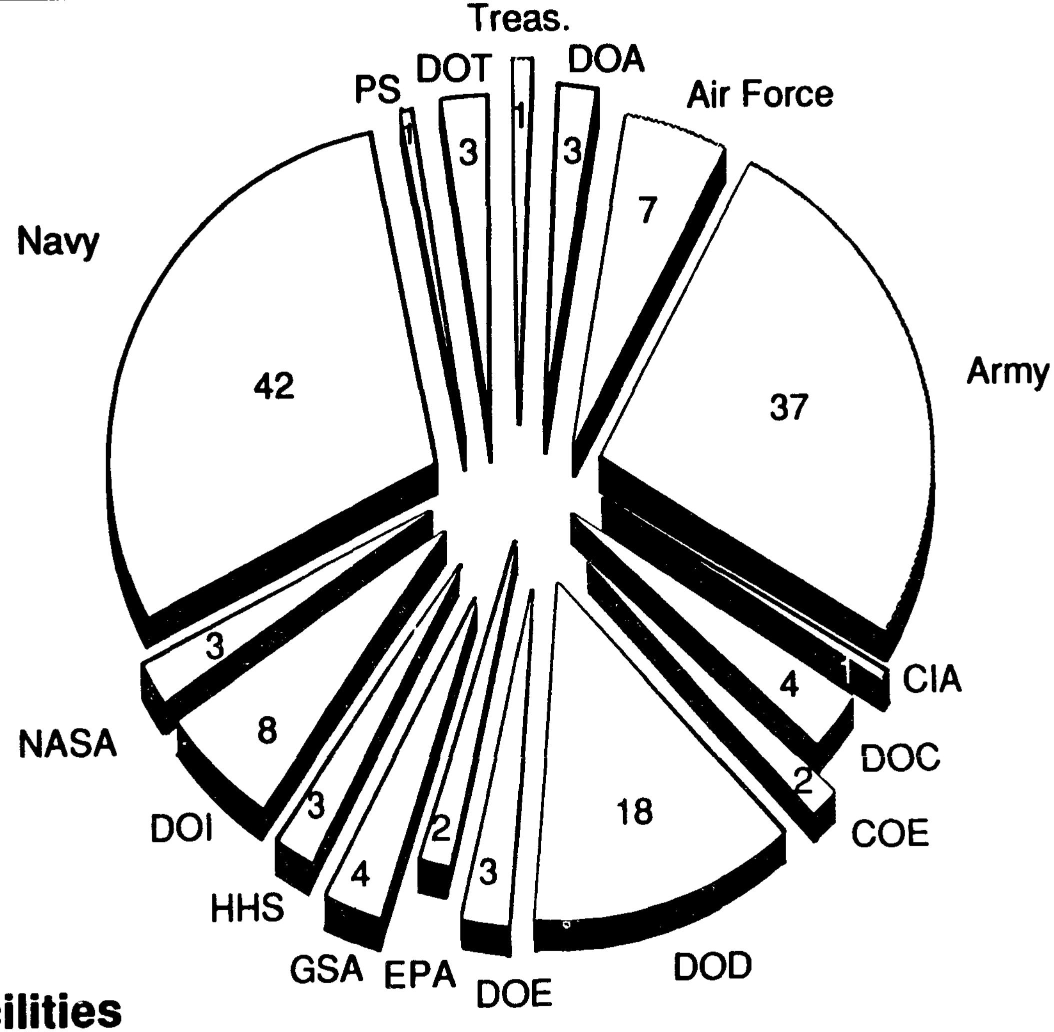
- Has been field-tested and proposed
  - Comments being incorporated into final rule

Region III Docket Facilities by State



= 142 Facilities

Region III Docket Facilities by Agency



= 142 Facilities

7.1 WORKSHOP B: COMMUNITY OUTREACH REQUIREMENTS

7.1 WORKSHOP B: COMMUNITY OUTREACH REQUIREMENTS

Alan Brown, Community Relations Coordinator, EPA Region III.

Mr. Brown discussed issues regarding community relations at federal facilities. The objective of community relation efforts as discussed by Mr. Brown, is to involve the public in activities and decisions made about superfund sites where past activities have led to hazardous release problems. He stressed that it is important not to put people in an adversarial position. A new journal called "Federal Facilities and the Environment" will soon be available to the public which will give the public an opportunity to comment and to provide input on technical issues at superfund sites.

Community relations is a team effort that involves the collaboration of technical staff, enforcement staff and staff with special expertise in community relations or public affairs. Mr. Brown suggested that personnel at federal facilities involved with hazardous waste get to know their own public affairs people. It is important to communicate to the public accomplishments regarding environmental issues. One way this can be done is through press releases.

Mr. Brown presented a handbook, "Community Relations in Superfund" produced by the EPA Office of Emergency and Remedial Response. The purpose of the handbook is to provide (1) policy requirements for coordinating community relations activities at superfund sites and (2) additional techniques and guidance that can be used to supplement and enhance the basic requirements for community relations.

U.S. Environmental Protection Agency
Region III

Superfund Fact Sheet

Delaware City PVC Site, New Castle County, DE

July 1990 Contact: Al Brown, 215-597-6925

Introduction

The U S Environmental Protection Agency (EPA) is working with Formosa Plastics Corporation and Stauffer Management Company (owned by ICI Americas Corporation) to implement cleanup technologies at the Delaware City PVC Site in New Castle County, Delaware This Fact Sheet tells you about

- Previous studies at the Site to determine the nature and extent of chemical contamination
- EPA's selected cleanup technology for the Site
- Costs associated with the investigation and remediation at the Site
- Opportunities for public involvement

Background on Previous Studies

The Delaware City PVC Site is located on Route 13 just west of the Star Enterprise Oil Refinery The Site is between Red Lion Creek to the north and Dragon Creek to the south The Site consists of a polyvinyl chloride (PVC) manufacturing facility owned by Formosa (acquired from Stauffer Chemical Corporation in 1981) and adjacent land with contaminated groundwater.

In April 1982, Stauffer detected chemical contamination in a domestic groundwater supply well on Stauffer property The well supplied water to housing that was owned by Stauffer and rented to Stauffer employees and the public

In 1983, EPA included the Site on the National Priorities List (NPL) because of the imminent public health hazard, thereby making the Site eligible for cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Previous hydrogeological investigations at the Site (conducted by Stauffer and reviewed by EPA and the State) identified a plume of contaminated groundwater below the Site The goundwater is contaminated with trichloroethylene (TCE), 1, 2-dichloroethane (EDC), and vinyl chloride monomer (VCM)

The major source of the contamination was unlined pits that contained PVC sludge Rainfall has washed contaminants from the sludge into the ground and contaminated the soil and groundwater The groundwater contamination plume has now migrated off-site

Exposure to the contaminants (TCE, EDC, VCM) by the surrounding community through air or soil is not likely, because the release of the contaminants to air is insignificant, in addition, skin contact with contaminated soil is not possible off-site and is highly unlikely on-site Exposure via groundwater would occur only through contaminated wells, and the users of these wells have been provided with alternative water supplies from deeper wells

Although the only domestic or industrial wells that have contamination are one on-site residential well, wells serving Foraker Getty Stapleford Chevrolet, and Diamond State Telephone Company relay station, and other wells could be threatened if the source of contamination and the migrating plume are not controlled

Site Cleanup Technology

In 1986, EPA reviewed several cleanup alternatives, selected a cost-effective technology that protects public health and the environment, and gathered public comments on the selected technology The cleanup primarily uses: (1) source removal and source control technologies, and (2) groundwater treatment technologies

The source removal and control technologies involve excavating contaminated soils and sludge, lining the pits

continued

United States Environmental Protection Agency, Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Site Cleanup *continued from front*

with a synthetic double liner, and covering and regrading several burial areas with synthetic caps and vegetative cover. Most of the excavated material has been sold for direct processing and recovery as a saleable finished product. The groundwater treatment technologies involve installing recovery wells at the edge of the plume and in several concentrated areas of contamination. Contaminated groundwater will be pumped from the wells and treated on-site to remove the contaminants.

Formosa is responsible for most of the source removal and control work. Stauffer is responsible for the groundwater recovery and treatment and capping the burial areas.

Formosa and Stauffer prepared detailed engineering designs of the cleanup technologies between January 1987 and May 1989. EPA and the State reviewed and approved the design at various stages as well as the final design.

Formosa and Stauffer began design and implementation in early 1990. The source removal and control should be completed in Fall 1990, while the groundwater treatment will continue to operate until the groundwater contamination is within safe levels. Reaching safe levels may take several decades but additional plume migration will be prevented as soon as the technology starts operating.

Cleanup Costs

The total cleanup cost will exceed several million dollars, and is being paid by Formosa and Stauffer. EPA and the State successfully negotiated with the two firms to assume these costs.

Upcoming Public Involvement Opportunities

All of the EPA and state staff are eager to work with the Delaware City community to address any concerns, and we welcome input from the community. EPA plans to conduct interviews with State and local officials and concerned citizens in August 1990. EPA is also planning a public meeting and additional fact sheets. Randy Sturgeon is EPA's Remedial Project Manager, and Al Brown is EPA's Community Relations Coordinator for the Delaware City PVC Site. Please do not hesitate to call either Randy or Al with questions about the Site (their telephone numbers are listed with their photos). Steve Johnson is the Project Officer and Roger Lucio is the Public Information Officer for the Delaware Department of Natural Resources and Environmental Control. Steve's phone number is (302) 323-4548 and Roger's phone number is (302) 736-4506. Also, please add your name to our mailing list for correspondence and indicate your interest in having a public meeting or receiving additional fact sheets.

Randy Sturgeon
(215) 597-0978

Randy Sturgeon, a chemical engineer with EPA for almost 2 years, is the Remedial Project Manager for the Delaware City PVC Site. Randy is responsible for overseeing the design and implementation of the cleanup technologies by Formosa and Stauffer. Randy will help ensure that the work progresses as planned and that Formosa and Stauffer meet EPA's high technical standards.

Al Brown
(215) 597-6925

Al Brown, who recently joined the EPA staff, is the Community Relations Coordinator for the Delaware City PVC Site. Al will work closely with Randy to coordinate public involvement and get informa[illegible] to the residents. Any questions can be directe[illegible] Al during his visits to Delaware City or at his office in Philadelphia.

MAILING LIST ADDITIONS

To be included on our mailing list for the Delaware City PVC Site, please complete this form and mail it to

Al Brown/3EA21
U S Environmental Protection Agency, Region III
841 Chestnut Building, Philadelphia, PA 19107

Name ______________________________

Street Address ______________________________

City, State and Zip ______________________________

Telephone Number ______________________________

Concern/Question About Site ______________________________

I would be interested in attending a public meeting
☐ YES ☐ NO

I would like to receive additional fact sheets
☐ YES ☐ NO

8.1 WORKSHOP C: UPDATE ON NEW DRINKING WATER STANDARDS/HOW CAN SMALL SYSTEMS COMPLY?

8.2 ATTACHMENTS

- Drinking Water Regulations

8.1 UPDATE ON NEW DRINKING WATER STANDARDS/HOW CAN SMALL SYSTEMS COMPLY?

Jeffrey Hass, Chief Drinking Water Section, EPA, Region III.

Mr. Hass presented an overview of the 1986 Safe Drinking Water Act Amendments (SDWA). There are two major categories of public water systems regulated by the SDWA, Community Water Systems and Noncommunity water systems. Noncommunity systems are subdivided into one of two categories; non-transient, for example schools and businesses, and transient, such as highway rest stops and motels. All public water systems are defined as those having 15 or more service connections or regularly serving at least 25 people 60 more days per year.

Noncommunity Systems include factories and schools which in the past have had fewer standards and requirements compared to community water systems. Previously, these systems were responsible for controlling only those contaminates known to contribute to acute or short-term health effects. Under the 1986 Amendments, these systems will be required to treat water in much the same fashion as standard utilities or community water systems.

The primary responsibilities of owners of school or business water systems will include monitoring for microbiological organisms, inorganics and volatile organics, public notification of possible contamination and reporting to regulatory agencies. Additional information on new regulations effecting non-transient noncommunity water systems is provided in the following article entitled: Drinking Water Regulations Expand for School and Business operated Water Systems.

Drinking Water Regulations Expand for School and Business Operated Water Systems

Since school operated and business operated water systems have not had extensive experience in meeting a wide range of drinking water regulatory requirements, the 1986 Safe Drinking Water Act (SDWA) Amendments are likely to have a profound impact on these systems. Operational changes — mainly in treatment and contaminant monitoring (sampling and analysis) — are likely for many of these systems.

If you are responsible for operating a school or business water system, this article is written for you. The article addresses current drinking water requirements with which your system must be in compliance and their related costs. Secondly, the article addresses compliance and enforcement issues. Finally, the article provides a brief overview of forthcoming regulations and some reference sources where additional information or assistance can be obtained.

Introduction

The 1986 SDWA Amendments broadly expand the regulatory safety net over water systems owned and operated by schools and businesses. Previously, these systems were responsible only for controlling contaminants known to contribute to acute or short-term health effects such as microbiological organisms and nitrates. With the passage of the 1986 Amendments, however, the U.S. Environmental Protection Agency (EPA) and States will require that these systems treat water in much the same fashion as standard utilities or community water systems. That is, school and business operated systems will now also be responsible for monitoring on a routine basis and treating, if necessary, for a host of chemical contaminants that pose chronic or long-term health risks.

Regulatory Overview

EPA is developing regulations on a staggered schedule in response to the 1986 SDWA Amendments. Consequently, some regulations have

School and Business Operated Water Systems are NTNCWSs under the SDWA

School operated and business operated water systems usually meet the criteria defining nontransient noncommunity water systems (NTNCWSs) under Federal and State drinking water regulations. NTNCWSs are defined under regulation as public water systems that *regularly* serve at least 25 of the *same* persons over six months per year. Prior to the passage of the 1986 Safe Drinking Water Act (SDWA) Amendments, these systems were only responsible for testing for conditions that posed ***short-term*** health risks to consumers, such as coliform bacteria contamination. Now that the SDWA Amendments are in place, however, these systems must also test for contaminants that pose ***long-term*** health risks to consumers.

NTNCWSs are one type of public water system regulated by the SDWA. The SDWA defines ***public water systems*** as those having 15 or more service connections or regularly serving at least 25 people 60 or more days per year. Public water systems can be publicly or privately owned and are subdivided for regulatory purposes into two major categories: *community* and *noncommunity water systems*. A ***community water system*** (such as a municipal utility) serves water to a resident population year round, whereas a ***noncommunity water system*** serves water to a nonresident population. Noncommunity systems are subdivided into one of two categories: ***nontransient*** (such as schools and businesses with their own water systems) or ***transient*** (highway rest stops and motels). These distinctions are important because under the 1986 SDWA Amendments school and business operated water systems will have to test for both long- and short-term risks, just like community systems. The requirements for transient systems will remain limited to controlling for short-term risks.

been *finalized and are presently effective*, while others have only been *proposed* or *will be proposed* in forthcoming months and years. By 1993, school and business operated water systems will need to comply with complex requirements for controlling over 100 microbiological and chemical contaminants. These requirements include monitoring, treatment, public notification, special lead notice, and lead-free materials. The standards are likely to necessitate major capital improvements such as requirements for filtration, disinfection, and corrosion control.

Current and Effective Drinking Water Requirements

Bacteria

Presently, you are required to routinely sample once each quarter for coliform bacteria. If a positive result (as determined by density) is obtained, you must take at least two consecutive daily follow-up or check samples. The frequency and necessity of further check samples is determined by your State's drinking water office.

Beginning on December 31, 1990, the coliform bacteria requirements will become more extensive. Information on the new requirements can be obtained from your State's drinking water office.

The current monitoring costs for coliform bacteria are approximately $100 year. This cost could increase to $1,000 annually if results are positive and follow-up samples are required.

Nitrates

Presently, you are required to have sampled at least once for nitrates and at any ongoing monitoring frequency required by your State's drinking water office. The maximum contaminant level (MCL) for nitrates is 10 milligrams per liter (mg/l). (The State may allow up to 20 mg/l under certain circumstances.)

The monitoring costs related to nitrates are approximately $50 per sample. The required amount of samples each year is determined by your State and is likely to be no more than four.

Turbidity

Presently, you are required to analyze for turbidity (cloudiness) only if your system uses surface water as a complete or partial supply source. If you operate such a system, you must sample once each day and remain below one Nephelometric Turbidity Unit (NTU) as determined by a monthly average. If your State rules out any risk to public health, your turbidity limit may be raised to as high as five, and your monitoring frequency may be reduced to less than daily.

These requirements will change on a staggered schedule for the system types noted below. These requirements can more fully be explained by your State's drinking water office.

Unfiltered Surface Water Systems
December 30, 1991

Filtered Surface Water Systems
June 29, 1993

Special Public Notice for Lead

As of June 19, 1988, you should have posted a special one-time public notice warning of the health concerns associated with the potential lead contamination of drinking water.

The notice was to be posted in full view at your facility and was to comply with the content requirements established by EPA's newly revised public notification regulations. If you have not yet posted a special notice concerning lead, you must still do so.

Lead Ban

As of June 19, 1986, all water systems were no longer permitted to install lead-based materials as part of their water supply collection, treatment, distribution, and plumbing systems. All newly installed solder, flux, pipes, and pipe fixtures are to be "lead-free." Solder and flux must contain less than 0.2 percent lead and pipes and pipe fixtures must contain less than 8.0 percent lead.

General Public Notification

On April 28, 1989, more stringent public notification requirements became effective. For water systems with violations exceeding an MCL, notices are to be made in accordance with language specified in the regulation. These notices are to be made within 14 days of the violation and remain in place until the violation is corrected. For less severe violations, water systems have up to three months to notify customers of the violation.

Volatile Organic Chemicals (VOCs)

MCLs are currently in effect for eight VOCs. If your system serves greater than 3,300 people, you are presently required to be in compliance with the monitoring requirements for these contaminants. If your system serves less than 3,300 people, you must have completed your first year of monitoring by December 1991.

Unregulated Contaminant Monitoring

Presently, systems serving greater than 3,300 people must have monitored for 34 unregulated contaminants (both volatile and synthetic organic chemicals). Systems serving less than 3,300 people must have completed the first year of initial monitoring by December 1991. At State discretion, systems may also be responsible for monitoring for an additional 17 unregulated contaminants.

How Do I Get My Water Samples Tested?

Unlike some community water systems, most school and business operated water systems do not have their own drinking water laboratory. As a result, these systems must obtain the services of a State-certified laboratory. A certified lab is one that has met the requirements of the State drinking water office; that is, they have the proper analytical equipment and trained personnel, and they have met the State's quality assurance standards.

Labs vary in how they interact with their customers. In some cases, the lab will send you the proper bottles and reagents and provide sample-taking instructions. In other cases, the lab will provide a technician to take samples at your facility. Flexibility in this regard will depend upon State laboratory requirements. All analytical results must be submitted to the State. Some States require that the lab submit the results; other States place the submission responsibility on the water system's owner/operator. Regardless of who submits the sample, the State determines compliance by comparing the analytical results to the relevant Federal/State standards.

Contact your State drinking water office if you need assistance in identifying a certified lab. The State's laboratory certification officer can send you a Statewide list of approved labs. The list will indicate the location of labs in your State (and possible adjacent States) and may indicate the contaminants for which a given lab is certified to test. ■

Forthcoming Drinking Water Requirements

Short Term and Immediate Requirements

As noted previously, EPA has issued newly revised standards for bacteria and turbidity and new standards for eight VOCs. Monitoring requirements have also been issued for 51 unregulated synthetic and volatile organic chemicals.

Volatile Organic Chemicals

MCLs are currently in effect for all systems; compliance dates for initial monitoring requirements are as follows:

>3300	Completed by 12/89
≤3300	Completed by 12/91

Unregulated Contaminant Monitoring

>3300	Completed by 12/89
≤3300	Completed by 12/91

Compliance dates for the new bacteria and turbidity requirements are as follows:

Bacteria	December 29, 1990
Turbidity	
Unfiltered surface waters:	December 30, 1991
Filtered surface waters:	June 29, 1993

Longer-Term Requirements

EPA has issued a final rule requiring filtration of all surface waters. According to this rule, school and business operated water systems (using surface water) will have to install filtration by January 29, 1993 unless they have met the extensive criteria to avoid filtration (as determined and approved by your State's drinking water office). Some States are requiring that all surface water systems install filtration. Systems using groundwater under the direct influence of surface water will receive State notification by June 1999 if they are to comply with the filtration requirements.

New regulations are *presently proposed* for 38 inorganic and synthetic organic chemicals (SOCs), and for corrosion control. New regulations will *soon be proposed* for the disinfection of groundwater systems, disinfection by-products, radionuclides, and more inorganic and synthetic organic chemicals.

Compliance and Enforcement

School and business operated systems—like all public water systems—are responsible for complying with both monitoring and MCL requirements. If the State indicates that a system is in violation of one or more of these requirements, the system is responsible for returning to compliance in a timely fashion. If difficulties are experienced by a system in the course of remediating a compliance problem, systems should consult their State drinking water office for technical assistance. If a system does not respond to its violation problem(s) in a timely manner (by resolving the problem(s) itself or consulting the State for assistance), it can expect an enforcement action to be taken against it by the State or EPA.

To Obtain Further Information

- Learn who to turn to for advice and assistance. Contact your State drinking water program, usually a part of the State health or environmental agency. Establish a working relationship with the State staff. They can assist you with many items including 1) gathering and understanding regulatory documents and other necessary reference materials and 2) determining whether the State regulations are in any way more strict than the EPA requirements.
- The U.S. EPA Safe Drinking Water Hotline can also assist you with 1) obtaining legal and regulatory information, 2) understanding requirements, and 3) contacting the proper authorities within your State. The number for the Hotline is 800/426-4791 or 202/382-5533.
- Develop a relationship with nearby community water systems. Due to their more extensive experience with drinking water provision, it may be possible to obtain valuable advice and recommendations with respect to understanding requirements and effective daily management and operation.
- For ensuring timely sample testing, identify more than one State-certified lab upon which to rely. Certified laboratories must use contaminant-specific test methods as specified by the regulations.
- If capital improvements are necessary, locate environmental engineering and planning consultants in order to begin your system upgrade activities.

9.1 WORKSHOP C: THE UNDERGROUND INJECTION CONTROL PROGRAM

9.1 THE UNDERGROUND INJECTION CONTROL PROGRAM

Karen Johnson, Chief Underground Injection Control Program, EPA, Region III.

Ms. Johnson presented information on the federal Underground Injection Control Program (UIC). The following information provided by the speaker reviews the purpose of the UIC program and program requirements.

The purpose of the UIC program is to protect underground sources of drinking water (USDWs) from improper injection. An injection well is defined as a bored, drilled or driven shaft, or a dug hole, whose depth is greater than the largest surface dimension and used for the emplacement of fluids underground. This definition also includes septic systems such as cesspools, leachfields, septic tanks and drainfields and drywells used for sanitary wastes for more than 20 persons per day, or if used for emplacement of any industrial wastes. This broad definition includes almost any artificial hole or improved sink hole in the ground.

The federal UIC program is authorized under the Safe Drinking Water Act of 1974, as amended, and includes five main categories of wells, based on the type of fluid injected and the relation of the injection zone to USDWs.

Class I: Wells used to inject hazardous* wastes or dispose of non-hazardous industrial waste and treated municipal sewage below the deepest USDW.

Class II: Wells used to inject fluids associated with the production of oil and gas. These wells normally inject below the deepest USDW except in cases where the USDW contains producible quantities of oil or gas.

Class III: Wells used to inject fluids for subsurface mining of minerals like the Frasch process or in-situ production of minerals.

Class IV: Wells which dispose of hazardous* or radioactive wastes into or above a USDW. These wells are banned.

Class V: Wells not included on the other classes, that inject non-hazardous fluid into or above a USDW. Table 1 further identifies the variety of wells in this class.

* Hazardous wastes as defined in 40 CFR Part 261 of the Resource Conservation and Recovery Act.

EPA has new standards for several constituents under the Resource Conservation and Recovery Act (RCRA) as part of the Land Disposal Restrictions program, identifying a number of new characteristic wastes based on concentration, rather than use of the constituent. The

Toxicity Characteristics Leaching Procedure (TCLP) replaces the Extraction Procedure (EP) toxicity test to determine if a waste is a hazardous waste and adds 25 chemicals and 14 metals to the list of hazardous wastes (Table 2 identifies these 25 constituents and their applicable hazardous concentrations). These 25 contaminants are new characteristic hazardous wastes and are banned from injection, unless injected into a permitted Class I well.

These new regulations may affect a large number of Class V wells and convert them to Class IV wells on a time table based on the effective dates of the new regulations. The effective dates for TCLP are September 25, 1990, for facilities that generate more than 1000 kg (approximately 275 gallons) of waste per month, and March 29, 1991, for facilities that generate between 100 kg (approximately 27 gallons) and 1000 kg of waste per month. Facilities that generate less than 100 kg per month are conditionally exempt.

All facilities operating injection wells are required to inventory their wells with EPA or the applicable State program (we will forward information to the appropriate Agency for you). The Class and type of well, and the kind of waste disposed will determine whether a permit is required. For further information contact Karen Johnson at (215) 597-9928.

TABLE 1

CLASS V INJECTION WELL TYPES

A. **Drainage Wells** (well code id.)

Agricultural Drainage Wells (5F1) - receive irrigations tailwaters, other field drainage, animal yard, feedlot, or dairy runoff, etc.

Storm Water Drainage Wells (5D2) - receive storm water runoff from paved areas, including parking lots, streets, residential subdivisions, building roofs, highways, etc.

Improved Sinkholes (5D3) - receive storm water runoff from developments located in karst topographic areas.

Industrial Drainage Wells (5D4) - wells located in industrial areas which primarily receive storm water runoff but are susceptible to spills, leaks, or other chemical discharges.

Special Drainage Wells (5G30) - used for disposing water from sources other than direct precipitation. Examples of this well type include: landslide control drainage wells, potable water tank overflow drainage wells, swimming pool drainage wells, and lake level control drainage wells.

B. **Geothermal Reinjection Wells**

Electric Power Reinjection Wells (5A5) - reinject geothermal fluids used to generate electric power - deep wells.

Direct Heat Reinjection Wells (5A6) - reinject geothermal fluids used to provide heat for large buildings or developments - deep wells.

Heat Pump/Air Conditioning Return Flow Wells (5A7) - reinject groundwater used to heat or cool a building in a heat pump system - shallow wells.

Groundwater Aquaculture Return Flow Wells (5A8) - reinject groundwater or geothermal fluids used to support groundwater. Non-geothermal aquaculture disposal wells are also included in this category (e.g. Marine aquariums in Hawaii use relatively cool sea water).

C. **Domestic Wastewater Disposal Wells**

Untreated Sewage Waste Disposal Wells (5W9) - receive raw sewage wastes from pumping trucks or other vehicles which collect such wastes from single or multiple sources. (No treatment)
Cesspools (5W10) - including multiple dwelling, community, or regional cesspools, or other devices that receive wastes and which must have an open bottom and sometimes have perforated

sides. Must serve greater than 20 persons per day if receiving solely sanitary wastes. (Settling of solids)

Septic Systems (Undifferentiated disposal method) (5W11) - used to inject the waste or effluent from a multiple dwelling, business establishment, community or regional business establishment septic tank. Must serve greater than 20 persons per day if receiving solely sanitary wastes. (Primary Treatment)

Septic Systems (Well Disposal Method) (5W31) - examples of wells include actual wells, seepage pits, cavitettes, etc. The largest surface dimension is less than or equal to the depth dimension. Must serve greater than 20 persons per day if receiving solely sanitary wastes. (Less treatment per square area than 5W32)

Septic Systems (Drainfield Disposal Method) (5W32) - examples of drainfields include drain or tile lines, and trenches. Must serve more than 20 persons per day if receiving solely sanitary wastes. (More treatment per square area than 5W31)

Domestic Wastewater Treatment Plant Effluent Disposal Wells (5W12) - dispose of treated sewage or domestic effluent from small package plants up to large municipal treatment plants. (Secondary or further treatment)

D. Mineral and Fossil Fuel Recovery Related Wells

Mining, Sand, or Other Backfill Wells (5X13) - used to inject a mixture of fluid and sand, mill tailings, and other solids into mined out portions of subsurface mines whether what is injected is a radioactive waste or not. Also includes special wells used to control mine fires and acid mine drainage wells.

Solution Mining Wells (5X14) - used for in-situ solution mining in conventional mines, such as stopes leaching.

In-situ Fossil Fuel Recovery Wells (5X15) - used for in-situ recovery of coal, lignite, oil shale, and tar sands.

Spent-Brine Return Flow Wells (5X16) - used to reinject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts.

E. Oil Field Production Waste Disposal Wells

Air Scrubber Waste Disposal Wells (5X17) - inject wastes from air scrubbers used to remove sulfur form crude oil which is burned in steam generation for thermal oil recovery projects. (If injection is used directly for enhanced recovery and not just disposal it is a Class II well.)

Water Softener Regeneration Brine Disposal Wells (5X18) - inject regeneration wastes from water softeners which are used to improve the quality of brines used for enhanced recovery. (If injection is used directly for enhanced recovery and not just disposal it is a Class II well.)

F. Industrial/Commercial/Utility Disposal Wells

Cooling Water Return Flow Wells (5A19) - used to inject water which was used in a cooling process, both open and closed loop processes.

Industrial Process Water and Waste Disposal Wells (5W20) - used to dispose of a wide variety of wastes and wastewaters from industrial, commercial, or utility processes. Industries include refineries, chemical plants, smelters, pharmaceutical plants, laundromats and dry cleaners, tanneries, laboratories, (e.g. petroleum storage facilities (storage tank condensation water), electric power generation plants (mixed waste stream of laboratory drainage, fireside water, and boiler blowdown), car wash (mixed waste stream of detergent, oil and grease, and paved area washdown), electroplating industries (spent solvent wastes, etc.).

Automobile Service Station Disposal Wells (5X28) - repair bay drains connected to a disposal well.

G. Recharge Wells

Aquifer Recharge Wells (5R21) - used to recharge depleted aquifers and may inject fluids from a variety of sources such as lakes, streams, domestic wastewater treatment plants, other aquifers, etc.

Saline Water Intrusion Barrier Wells (5B22) - used to inject water into fresh water aquifers to prevent intrusion of salt water into fresh water aquifers.

Subsidence Control Wells (5S23) - used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with overdraft of fresh water and not used for the purpose of oil or natural gas production.

H. Miscellaneous Wells

Radioactive Waste Disposal Wells (5N24) - all radioactive waste disposal wells other than Class IV wells.

Experimental Technology Wells (5X25) - wells used in experimental or unproven technologies such as pilot scale in-situ solution mining wells in previously unmined areas.

Aquifer Remediation Related Wells (5X26) - wells used to prevent, control, or remediate aquifer pollution, including but not limited to Superfund sites.

Abandoned Drinking Water Wells (5X29) - used for disposal of waste.

Other wells (5X27) - any other unspecified Class V wells. <u>Well type/purpose and injected fluids must be specified</u>.

TABLE 2

TC Constituents and Their Regulatory Levels

Newly Added Constituents

Constituent	Regulatory Level (mg/1)	Constituent	Regulatory Level (mg/1)
Benzene*	0.5	Hexachlorobenzene	0.13
Carbon Tetrachloride*	0.5	Hexachloro-1, 3-Butadiene	0.5
Chlordane	0.03	Hexachloroethane	3.0
Chlorobenzene	100.0	Methyl Ethyl Ketone	200.0
Chloroform	6.0	Nitrobenzene	2.0
O-Cresol	200.0	Pentachlorophenol	100.0
M-Cresol	200.0	Pyridine	5.0
P-Cresol	200.0	Tetrachloroethylene	0.7
1, 4-Dichlorobenzene*	7.5	Trichloroethylene*	0.5
1, 2-Dichloroethane*	0.5	2, 4, 5-Trichlorophenol	400.0
1, 1-Dichloroethylene*	0.7	2, 4, 6-Trichlorophenol	2.0
2, 4-Dinitrotoluene	0.13	Vinyl Chloride*	0.2
Heptachlor	0.008		

EP Constituents (Being Retained at Current Levels)

Constituent	Regulatory Level (mg/1)	Constituent	Regulatory Level (mg/1)
Arsenic*	5.0	Silver*	5.0
Barium*	100.0	Endrin*	0.02
Cadmium*	1.0	Lindane*	0.4
Chromium*	5.0	Methoxychlor*	10.0
Lead*	5.0	Toxaphene*	0.5
Mercury*	0.2	2, 4-D*	10.0
Selenium*	1.0	2, 4, 5-TP (Silvex)*	1.0

* Regulated based on an MCL

Briefing for the Deputy Administrator:

The Toxicity Characteristic Final Rule

EPA

10.1 WORKSHOP D: WASTE MINIMIZATION EFFORTS - AN OVERVIEW OF THE U.S. EPA POLLUTION PREVENTION RESEARCH PROGRAM

10.2 ATTACHMENTS

- "Waste Minimization Efforts - An overview of the U.S. EPA Pollution Prevention Research Program"
- "The EPA Waste Minimization Assessment Research Program: An Overview"
- Pollution Prevention Research Branch, Current Projects
- Pollution Prevention Research Branch, Publications

10.1 WORKSHOP D: WASTE MINIMIZATION EFFORTS - AN OVERVIEW OF THE U.S. EPA POLLUTION PREVENTION RESEARCH PROGRAM

Jim Bridges, Chief, Products and Assessments Section - Pollution Prevention Research Branch, Risk Reduction Engineering Laboratory

Mr. Bridges described pollution prevention research currently ongoing at the Risk Reduction Engineering Laboratory in Cincinnati, Ohio. Studies are being performed in conjunction with universities, other EPA offices, states, other federal agencies and private industry. Projects are being conducted in the following research areas; product, process, socioeconomic, recycling and technology transfer.

Product research activities have focused on evaluating the potential for safe product substitutes and product life cycle analysis.

Process research deals with ways to effectively eliminate or minimize the generation of wastes in for industrial processes research.

Recycling research is concerned with developing innovative separation and collection techniques for post consumer materials that reduce costs and the amount of waste generated in the recycling process. The main emphasis in this research area is with municipal solid waste.

Socioeconomic research activities are concerned primarily with developing a method for measuring waste minimization.

Research in technology transfer focuses on the dissemination of information through project reports, project summaries, workshops, meetings, case studies and demonstrations.

"WASTE MINIMIZATION EFFORTS - AN OVERVIEW OF THE U.S. EPA POLLUTION PREVENTION RESEARCH PROGRAM"

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INTRODUCTION

Since 1988, the U.S. EPA has supported a formal research program to encourage the development and demonstration of techniques and technologies for reducing the generation of pollution. The concept of "pollution prevention" is not new and continues to provide practical solutions to the complex problems of waste management. Pollution prevention is a term that describes approaches to environmental improvement that involves eliminating or reducing the quantity and/or toxicity of pollutants rather than treating pollutants for safer disposal. No longer can researchers be satisfied with providing support for regulations on pollution limits and control technologies without focusing their efforts on research to avoid producing the waste. When Congress declared a national policy on waste minimization as part of the 1984 Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act (RCRA), we all had to realize the importance of pollution prevention to the well-being of our environment. A formal response to the EPA Administrator from the Science Advisory Board (SAB) entitled "Future Risk: Research Strategies for the 1990's" recommends that EPA shift the center of its environmental protection strategy from end-of-pipe control technology to pollution prevention. To date, the Agency administers many federal environmental laws to reduce pollution problems after the pollution has been generated. The change in focus attacks the pollution problem at the origin without regulatory inducements and requires increased efforts in pollution prevention research, development and demonstration (RD&D) to support this new direction. The purpose of this paper is to describe the current pollution prevention research program assigned to the Risk Reduction Engineering Laboratory which incorporates multi-media direction in providing practical solutions to the complex problems of waste management.

POLLUTION PREVENTION RESEARCH PROGRAM GOALS

The Pollution Prevention Research Plan: Report to Congress is the foundation for the current and future pollution prevention research program within the Agency. The plan builds on past and current EPA pollution prevention efforts and identifies six research goals for the Agency's Pollution Prevention Research Program. The six fundamental goals of the research program are to:

1. **Stimulate private sector development and use of products that result in reduced pollution.**

2. **Stimulate private sector development and implementation of technologies and processes that result in reduced pollution.**

3. **Expand the reusability and recyclability of wastes and products and the demand for recycled materials.**

4. **Identify and promote the implementation of effective socioeconomic and institutional approaches to pollution prevention.**

5. **Establish a program of research that will anticipate and address future environmental problems and pollution prevention opportunities.**

6. **Conduct a vigorous technology transfer assistance program that facilitates pollution prevention strategies and technologies.**

The Pollution Prevention Research Branch is meeting these goals through a structured research program that covers the six major areas of: products research, processes research, recycling and reuse research, socioeconomic and institutional research, anticipatory research, and technology transfer and technical assistance. While each research program area corresponds to a specific research goal, there are many cross-cutting issues and multiple objectives within the research program areas that support the achievement of other research goals. The Pollution Prevention Research Plan: Report to Congress (EPA/600/9-90/015) may be obtained at no charge from EPA's Center for Environmental Research Information, 26 West Martin Luther King Drive, Cincinnati, Ohio 45268.

CURRENT ACTIVITIES

Products Research Program

All products are potential pollutants at one or more stages of their life cycle, and it is necessary that pollution impacts associated with products be reduced. The current research projects in the Products Research Program focus on products and their pollution burdens throughout the product's life cycle and not on just one stage of the cycle such as design, manufacturing (processing), or packaging.

Several projects are in place to support research in the area of clean product research. A background document on clean products research and implementation has been prepared at the request of EPA to provide background information on the current state of research activities on the subject products, and to identify issues that must be resolved as programs are implemented. Through the University of Tennessee, EPA is conducting a "safe substitutes" study to identify environmentally "safe" products based on product, packaging, and process for several product categories. The first year effort of this study is devoted to high profile products that are likely to enter the municipal solid waste (MSW) stream. A clean products case studies project conducted with INFORM, Inc. is designed to produce several documents of various companies involved in developing programs to produce and market products that might be categorized as "clean" products.

A cooperative effort involving several EPA offices as well as other groups representing industry and environmental interests proposes to prevent pollution at the pre-production stage by reducing market demand for consumer products entailing "risk" to human health and the environment. A final product of this project will be a guide for consumers and producers describing the product group, a scoring process, cost information and risks associated with alternative products.

Research guidance and direction will result from a product life cycle analysis (PLA) workshop with producers of several well known consumer products. EPA feels that an approach to the Clean Products Research Program should be the sponsorship of several specialized product workshops to receive input from industry, consumers, government, and others to better understand and identify research needs. In addition to these projects, a cooperative agreement with the University of Michigan is being developed to produce a guidance manual for industry on determining product design changes.

Processes Research Program

The Processes Research Program area includes developing and demonstrating innovative engineering and scientific technologies and techniques to reduce the volume of waste produced and the toxicity of wastes generated from the manufacture, processing, and use of materials. As with products, all processes are potential areas of waste generation. These processes include the operations associated with agriculture, mining, construction, manufacturing, transportation, wholesale and retail trade, and service industries.

Many of the projects for this research program area are part of the Waste Reduction Innovative Technology Evaluation (WRITE) Program which was established to promote a national pollution prevention policy by forming research partnerships with EPA, industry, State and local governments and academia in an effort to encourage the development and/or demonstration of effective technologies for waste reduction. The WRITE Pilot Program, with State and local governments, addresses immediate information needs between government and industry. Initial participants in this program are: California; Connecticut; Erie County, New York; Illinois; Minnesota; New Jersey; and Washington.

An example of the WRITE Program is the Washington WRITE Project whereby five pollution prevention technologies are being evaluated that are either implemented at full-scale at the present time or are to be implemented within the time frame of this three year study. An example technology involves the recycling of acetone still bottoms and the substitution of water-based cleaners for acetone with the objective of eliminating such RCRA wastes. Wastes of this type are generated by a large number of relatively small fabrication shops in the State of Washington and across North America. The Washington Department of Ecology has arranged for this study to include an evaluation at a fiberglass boat manufacturer and at a company that makes bathtubs, shower stalls, and spas. This technology evaluation will provide data on the environmental, technical, and economic effects on the recycling of still bottoms, drying, grinding, and reformulating the product into a resin filler putty that was previously made from virgin material.

Another part of the Processes Research Program is the development and use of "The Waste Minimization Opportunity Assessment Manual", EPA/625/7-88/003, that was prepared for individuals who are responsible for planning, managing, and implementing waste minimization activities at waste generating sites and facilities. This Manual assists waste generators in seeking opportunities to reduce the generation of hazardous and non-hazardous wastes by conducting waste minimization assessments within the operations of a facility. The Processes Research Program has supported and continues to support several projects to demonstrate the use of the Manual. Copies of this manual may be obtained at no charge from EPA's Center for Environmental Research Information, 26 West Martin Luther King Drive, Cincinnati, Ohio 45268.

Through a cooperative agreement with the New Jersey Department of Environmental Protection (NJDEP), EPA is using the Manual to conduct waste minimization assessments at thirty New Jersey companies across ten industry segments. The waste minimization assessments portion of the Processes Research Program will be primarily supported in the next two years through a cooperative agreement with the University City Science Center (UCSC). Assessment teams composed of faculty and students have been established at the University of Tennessee (Knoxville), Colorado State University (Fort Collins), and the University of Louisville under the direction of the UCSC will initiate waste minimization assessments at small and medium-sized businesses which lack the in-house capability for initiating waste minimization programs. In addition, EPA has published a series of industry-specific waste minimization guidance manuals in cooperation with the California Department of Health Services. Seven manuals are available for the following industries: paint formulators, pesticides, commercial printing, metal fabricators, circuit board manufacturing, hospitals, and research and educational institutions. A second set of eleven manuals are being prepared.

EPA provides support to other federal activities through the Waste Reduction Evaluations At Federal Sites (WREAFS) Program was designed to encourages the participation of other Federal agencies in pollution prevention research and demonstration projects. This popular program has on-going projects with results being transferred to both the private and public sectors. The three major objectives of the WREAFS Program are to 1) conduct waste minimization assessments and case studies; 2) conduct research and demonstration projects jointly with other Federal activities; and 3) provide technology and information transfer of pollution prevention results.

Waste minimization opportunity assessments have been conducted at the Philadelphia Navy Shipyard, Army Forces Command - Ft. Riley (Kansas), Naval Undersea Warfare Engineering Station - Keyport (Washington), and the Veteran Affairs Medical Center - Cincinnati (Ohio). Assessments are on-going at the US Coast Guard's Governor's Island Facility and other facilities. A major waste minimization research program is in the planning stages with the Department of Energy as a research agenda is being prepared under a Memorandum of Understanding (MOU) for approval by DOE and EPA. A cooperative EPA Region 10 workshop for technology transfer within the Federal Community is being planned for later this year. As the concept of pollution prevention is rapidly being embraced throughout industry and government, the need for RD&D and the WREAFS Program becomes increasingly more popular within the Federal community.

Recycling and Reuse Research

Research for recycling and reuse requires more than finding innovative separation and collection techniques for post-consumer materials. As earlier discussed in the research areas for products and processes, recycling and reuse research begins with the design of a product and the technique is carried through the manufacturing of a product with recycle/reuse as part of the process and finally comes to the steps most familiar with the consumer. The steps most often seen by the consumer are at the points of separation and collection where the post-consumer materials then go for reprocessing or remanufacturing to complete the recycle loop. Not until the material is reused has recycling occurred. The projects discussed in the previous sections consider recycle of materials within the process and waste minimization assessments consider reuse after all source reduction options are exhausted.

Within the area of municipal solid waste, after the waste has been generated and is ready to be managed, recycling and reuse are important options for the integrated solid waste management scheme, particularly for wastes generated by communities. Recycling is a fundamental part of any integrated waste management system, yet only about 10 - 15% of municipal solid waste is currently recycled. Research is needed to identify and demonstrate recycle and reuse techniques that are practical and cost effective in order to increase the percentage of MSW being recycled. Research is also needed for solutions to the institutional and other barriers that block recycling.

One example of a current recycle research project is with the USDA's Forest Products Laboratory where a study is being conducted to investigate the potential for reclaiming newsprint by means of a dry fiberizing process. Another project with the Forest Products Laboratory involves lab and pilot-scale work to develop commercially viable thermoformable composite products using recycled high density polyethylene (HDPE), wood flour, recycled wood fiber, and reclaimed polyester fiber. Results from these research projects will have a positive impact on other pollution prevention programs.

Socioeconomic Research

Socioeconomic research focuses on identifying and evaluating non-technical factors that affect pollution prevention opportunities. Understanding consumer behavior, identifying incentives and social barriers, assessing trends and cycles of production, consumption and use, and developing measurement methods for quantification of pollution prevention are all part of this research area. Waste generators need to understand the full costs associated with the management of wastes before they can realize how pollution prevention can be a part of the integrated waste management solution. Decision makers need the true costs for their waste management alternatives before they can make an informed decision. These costs are not only economic considerations but include a number of non-technological factors such as legal mandates, attitudes, habits, liabilities, and culture. The life cycle of a product should include these criteria to determine production and use for decision makers. A number of decision maker guides will be key tools to be used in the direction and implementation of pollution prevention programs within the integrated waste management system.

Two such research projects are underway with several more in the planning stages. The first project is with the Louisville and Jefferson County Metropolitan Sewer District (MSD) to develop and implement a comprehensive pollution prevention assessment process for public agencies and institutions located in the Louisville Metropolitan area. Under a cooperative agreement with EPA, MSD will evaluate the current status of pollution prevention awareness and activities at a number of State, local, and Federal activities. A pollution prevention assessment process specifically for public agencies will be developed and then tested at the MSD and at other agencies. The widespread use of a uniform procedure will enhance the transfer of information among facilities having common waste management problems and similar pollution prevention opportunities.

A second project in this area is a study to develop a methodology for measuring pollution prevention. Many communities, organizations, government entities, and other waste generators are setting waste reduction and recycling goals without an accepted procedure or methodology. To adequately reflect the progress of pollution prevention and determine success, it is necessary to utilize an appropriate measurement methodology that is acceptable to the private and public sectors. The objective of this initiative is to develop a decision maker's guide for calculating the progress of pollution prevention for hazardous and non-hazardous multi-media waste reduction.

Anticipatory Research Program

Currently the Agency depends on longer term anticipatory research to be conducted at EPA sponsored University Research Centers and Hazardous Substance Research Centers with direction from the ORD. While we recognize the importance of anticipatory research in the pollution prevention research program, limited funds at the Laboratory level do not permit the development of anticipatory research projects at this time. Through committee and advisory board representation, anticipatory pollution prevention research projects are encouraged and are in process at several of these Research Centers.

As described in the Pollution Prevention Research Plan: Report to Congress, the three major areas of long-term research that are essential to a comprehensive pollution prevention research program are:

1. **Anticipating and responding to emerging environmental issues and using pollution prevention approaches to mitigate these issues.**

2. **Evaluating emerging technologies for their potential contribution to pollution prevention and stimulating those that are preferable to existing technologies.**

3. **Evaluating the effectiveness of the Agency's pollution prevention research in meeting changing user information needs.**

Technology Transfer and Technical Assistance

Without technology transfer and technical assistance activities, the pollution prevention research program would have no avenue to disseminate the results. The success of the research components of this program depend on EPA's ability to transfer the technical information to meet the specific needs of waste generators in the public and private sectors. Current projects include the sponsorship of the Pollution Prevention Information Clearinghouse, American Institute for Pollution Prevention, and various workshops and conferences. A successful three-day international conference on pollution prevention was held June 10-13, 1990, in Washington, D.C., with over 1000 attendees from 43 different countries.

The American Institute for Pollution Prevention (AIPP) was established through the University of Cincinnati to provide a liaison channel between EPA and potential implementors of pollution prevention techniques, primarily in industry, that can assist the EPA in improving the quality and cost-effectiveness of its program in the pollution prevention area and that can help generate both private and public sector support for pollution prevention concepts. Some 20 individuals have been appointed to Institute membership. The AIPP is organized into four councils representing economics, education, implementation, and technology. Each of these councils has developed a set of specific 1 to 2 year objectives that includes information transfer and technical assistance.

The objective of the Pollution Prevention Information Clearinghouse (PPIC) is to establish a national information clearinghouse on the subject of pollution prevention. PPIC provides a wide range of information services related to pollution prevention and is meant to serve the needs of Federal, State and local government agencies, large and small businesses, trade associations and others requesting pollution prevention research information. PPIC can be accessed by a toll-free telephone "hotline" or by computer. PPIC contains abstracted and indexed technical information regarding pollution prevention techniques applicable to different industries, manufacturing processes, and types of wastes. It also contains information concerning Federal and state assistance programs, legislative and policy matters, lists of knowledgeable contacts, a schedule of pertinent meetings, and conferences and training sessions. For further information on any aspect of the PPIC, call the PPIC technical support contract telephone number (703) 821-4800.

MUNICIPAL SOLID WASTE AND POLLUTION PREVENTION RESEARCH

The Municipal Solid Waste Subcommittee (MEWS) of the Environmental Engineering Committee (EEC) of the EPA Science Advisory Board (SAB) has prepared a Research-In-Progress report on the Agency's MSW Research Program. The review examined the research areas of source reduction, recycling, thermal destruction, land disposal, and special wastes management. The MSWS recommended priority shifts in the proposed research areas stating that source reduction be the top priority and that recycling research should be coordinated with source reduction research.

The Solid Waste Dilemma: An Agenda for Action describes the massive MSW problem and the recommendations of integrated waste management favoring source reduction and recycling as the preferred waste management options. To meet the national goals and problems associated with MSW, a strong pollution prevention (source reduction and recycling) research program is needed to substantially reduce the generation of wastes. The ORD is supporting research in all areas related to pollution prevention of MSW and has discussed many of these projects in earlier portions of this paper.

MSW source reduction projects include product research, plastic degradability studies, safe substitutes research, and life cycle analysis. The MSW Source Reduction Research Program has the four following objectives:

1. To establish models for assessing environmentally preferable products.

2. To identify and evaluate the pollution generation characteristics of both existing and new products and of changing product-use patterns.

3. To develop a methodology for measuring the impact and benefits of source reduction.

4. To identify opportunities for source reduction and to conduct source reduction opportunity assessments for a variety of waste streams.

MSW recycling projects include waste separation studies, recycle verses virgin materials studies, technology development and demonstration for recovering materials for reuse, and a compilation of alternative recycling operation options. The MSW Recycling Research Program objectives are:

1. To assess the health and environmental risks associated with recycling and resource recovery operations.

2. To develop, demonstrate, and evaluate recycling and resource recovery techniques and technologies.

3. To identify and evaluate innovative waste separation mechanisms that facilitate the separation of recyclable materials from the waste stream.

FUTURE RESEARCH PLANS

A July 5, 1990, memorandum from the EPA Assistant Administrator for Research and Development shares a vision statement with all ORD employees that EPA must become a science agency as well as a regulatory agency. The statement goes on to set six goals for ORD for the next 2 - 3 years and one of the goals is for pollution prevention research. The goal is as follows: " ORD should become the leading institution in the United States for supporting the development of new methodologies and technologies for preventing or reducing volumes of harmful pollutants and providing that information to the user community."

Currently a Pollution Prevention Strategic Plan is being developed at the Laboratory level to make the link from planning to projects to outputs to research needs to participants and clients. This five year plan clearly emphasizes contemporary and future research needs and adds specificity to the Pollution Prevention Research Plan: Report to Congress and the "Municipal Solid Waste Research Agenda".

The EPA Science Advisory Board (SAB) in their report Future Risk: Research Strategies for the 1990's recognized pollution prevention as a valid approach to environmental protection and focuses on the importance of pollution prevention as a cost effective alternative to "end-of-pipe" pollution control. The SAB also noted that EPA is the only entity that is likely to exert leadership in conducting the basic environmental research needed to address future environmental issues and cross-media problems.

There is no doubt that pollution prevention research is supported by the Agency management. The Pollution Prevention Research Program has achieved early success evaluating and demonstrating pollution prevention techniques and technologies. Each of the projects and programs described in this paper is part of EPA's overall research program for the 1990's. A solid foundation built with quality science and careful planning is the basis for future pollution prevention research within the Agency.

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THE EPA WASTE MINIMIZATION ASSESSMENT RESEARCH PROGRAM: AN OVERVIEW

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INTRODUCTION

The EPA's research program to encourage the use of waste minimization opportunity assessments is presented in this paper. The early stages of EPA research centered on the develop of the EPA-recommended procedure for conducting an assessment, and its use at a number of facilities. This paper will demonstrate the value of the waste minimization assessment for discovering and developing opportunities to minimize wastes by presenting briefs on assessments recently conducted at several Federal facilities and private concerns.

While the word "assessment" often raises the fear that what is being talked about is an environmental audit, the assessment team is not looking for incidences of facility non-compliance. Their purpose is to examine a process and its components for inspiration to develop techniques that would enhance the cleanliness of a particular process or operation. To accomplish this goal, certain team members must have technical background appropriate to the type of process they are assessing. Therefore, a knowledge of RCRA compliance and SARA Community Right-to-Know regulations is not required of the assessment team.

Conducted by an in-house team or with an independent outside consultant, a waste minimization opportunity assessment (WMOA) is simply a structured review of a process or operation to lead to identified opportunities for waste reduction or recycling. Its focus can be broad or narrow. Often, it is more effective to select a few areas for intensive assessment than to attempt to cover all waste streams and processes at once.

The EPA has published "The Waste Minimization Opportunity Assessment Manual" (EPA/625/7-88/003) for conducting a waste minimization assessment. This manual is available at no cost from the EPA's Pollution Prevention Research Branch, Cincinnati, Ohio, 45268. The procedure recommended in the manual is outlined in Figure 1. WMOA's are an extremely effective way to improve a facility's operations, from both an economic and environmental standpoint.

The following sections describe some of the assessment efforts currently being conducted by the EPA.

DEPARTMENT OF DEFENSE

The greatest quantities of hazardous waste within the Department of Defense (DoD) are generated by plating, cleaning, and stripping operations. To date, the EPA's Waste Reduction Evaluations at Federal Sites (WREAFS) Program support of DoD pollution prevention activities include projects conducted at the Philadelphia Naval Shipyard, Fort Riley (Kansas) Army Forces Command, and the Naval Undersea Warfare Engineering Station in Keyport, Washington. These projects have identified pollution prevention opportunities for a range of industrial and military operations including: metal cleaning, solvent degreasing, spray painting, vehicle and battery repair, ship bilge cleaning, and weapons overhaul. The resultant pollution prevention recommendations and research identification are source reduction methods including technology, process, and procedural changes and recycling methods, which focus on reuse and recycling.

WASTE MINIMIZATION ASSESSMENT PROCEDURE

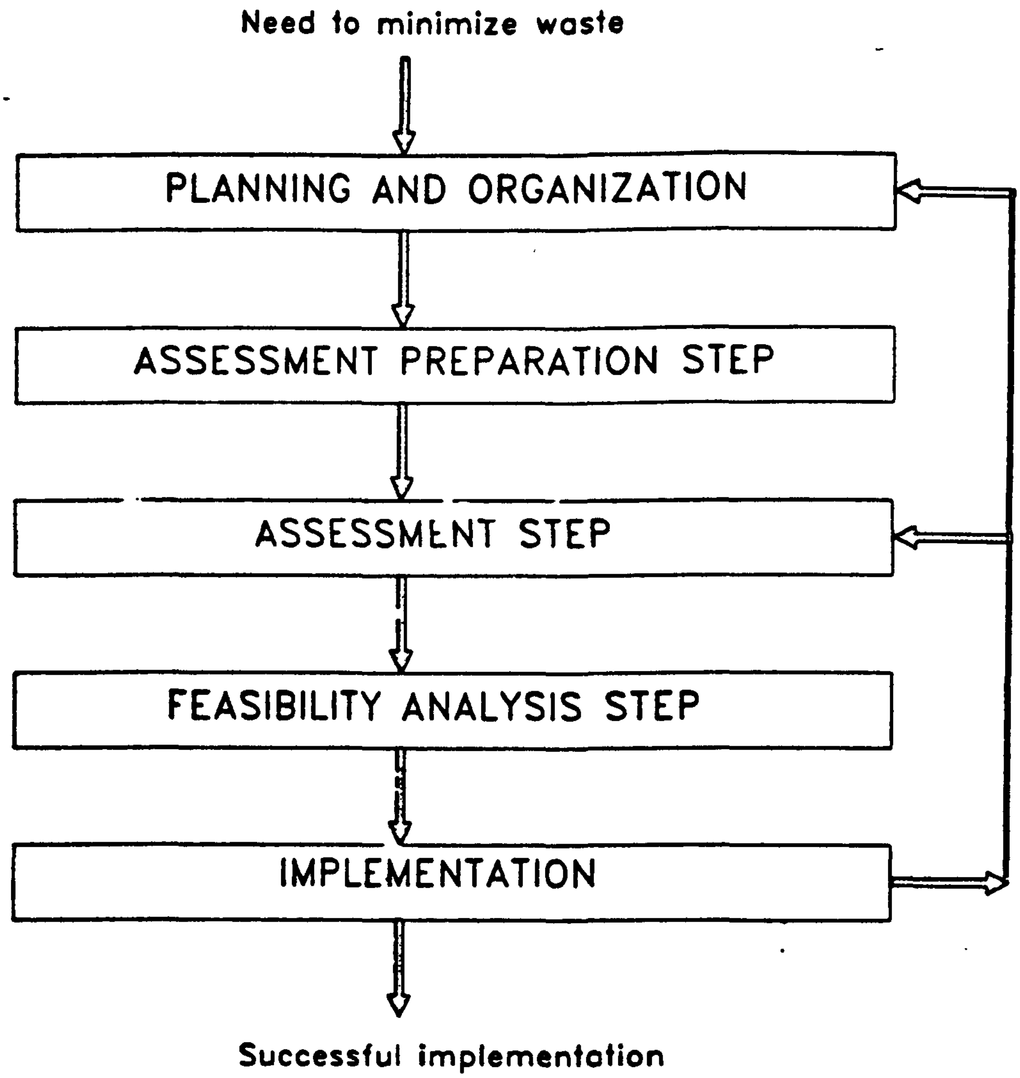

FIGURE 1

Philadelphia Naval Shipyard Assessment

One of the WREAFS sites chosen for performance of a waste reduction assessment is the Philadelphia Naval Shipyard (PNSY). This Federal facility specializes in revitalizing and repairing operational naval vessels. A wide range of industrial processes are performed at the PNSY, many of which generate wastes. This project focused on the processes and wastes of operations related to aluminum cleaning, spray painting, and bilge cleaning. Seven waste minimization options were evaluated during this project using EPA's Waste Minimization Opportunity Assessment Manual.

An aluminum cleaning operation is performed to remove oil and other materials from the surfaces of aluminum sheets prior to welding. This process is critical in that the welding operation cannot be performed unless the metal surfaces are properly cleaned. The cleaning line consists of four tanks: two process tanks and two rinse tanks. The process tanks contain a proprietary cleaning solution. One of the process tanks is heated (steam coil) and the other is at ambient temperature. The heated tank is used more often since it provides better oil removal. The rinse tanks contain tap water. Both rinse tanks are heated.

The process tanks become diluted after repeated operation due to dragout losses and tap water replenishment. These tanks also collect floating oil, and the solution becomes contaminated with suspended solids. During this project, drag-out reduction methods and an alternative rinsing procedure were evaluated which would reduce the frequency of discharge for these wastestreams.

The spray painting processes are used for small and medium-sized aluminum and steel parts. Aluminum parts are degreased by wiping with rags that have been dipped in xylene. The parts are then spray painted in a water curtain booth. The painting process typically consists of a zinc chromate primer, air drying, a final enamel paint coating, and air drying. A new booth water chemical system was used for the first time during the survey.

The economics of the new booth maintenance system were evaluated during this project. Also, optional dewatering equipment was evaluated which is currently under consideration by PNSY. The dewatering equipment will reduce the volume of paint sludge generated by the maintenance system.

PNSY employs a chemical cleaning process for ships' tanks, bilges and void spaces termed the citric acid process. It is generally performed while ships are in drydock. This process is relatively new (1976) and it replaces the mechanical methods of cleaning and derusting metal surfaces. The procedures involve the use of a citric acid/triethanolamine (TEA) solution to remove the oxides from the metal surfaces, and subsequent neutralization and rinsing with dilute solutions.

The results of the PNSY assessment indicated that the best options in terms of cost savings are the awareness and training program for paint waste reduction and the changes to the aluminum cleaning line including the dragout reduction, bath maintenance, and improved rinsing. These three options offer a combined net savings of $158,680 per year (see Table 1).

TABLE 1. PHILADELPHIA NAVAL SHIPYARD SUMMARY OF WM OPTIONS

Location Process and Waste	WM Options	Nature of WM Option	Total Capital Investment $	Savings $/yr	Payback Period yr	Est. Waste Reduction lb/yr
BUILDING 990						
Aluminum Cleaning Spent KRC-7X	Bath Maintenance	Equipment	$12,200	$44,190	0.3	44,035
	Two Stage Rinse	Equipment	3,116	34,590	0.1	190,590
Spray Painting of Aluminum Paint Sludge	Booth Chemicals	Materials	12,190	5,430	2.3	-
	Paint Sludge Dewater.	Equipment	9,550	3,840	2.5	15,012
Used Paint Thinner and Unused Paint	Awareness & Training	Personnel/ Proced.	24,266	79,900	0.3	unknown
BUILDING 1028						
Spray Painting of Steel Paint Sludge	Booth Chemicals	Materials	3,300	5,460	0.6	27,022
	Paint Sludge Dewater.	Equipment	same as bldg 990	-	-	-
DRYDOCKS						
Citric Acid Derusting Conc. Citric Acid/TEA	ED Recovery System	Equipment	76,050	60,720	1.3	124,241

Ft. Riley (Kansas) Army Forces Command

Another WREAFS site was the U.S. Army Forces Command (FORSCOM) located at Ft. Riley, Kansas. This government-owned, government-operated installation provides support and training facilities for the 1st Infantry Division, Non-Divisional Units, and tenant activities. The areas selected for assessment were the Division motor pools. Results of the waste minimization assessment identified two waste reduction opportunities in a multipurpose building used for automotive subassembly rebuilding, lead acid battery repair as well as other maintenance operations.

One opportunity is with the lead acid battery repair shop where battery acid is currently being drained from the dead batteries and batteries being repaired. It is proposed that the waste battery acid be collected in a holding tank, filtered to remove particulates, and adjusted in concentration to 37 percent sulfuric acid as needed for reuse in reconditioned or new batteries. Battery acid disposal is currently costing twice as much as new acid procurement. By reusing the spent acid, the cost of disposal and purchase of new acid will be reduced.

The second waste reduction opportunity is in the area of automotive parts cleaning. Currently the dirty aqueous alkaline detergent solution for automotive parts cleaning, which contains trace levels of lead, chromium, and cadmium as well as the oils, grease, and dirt is drained to an on-site evaporation pond. The proposed waste minimization option for this waste stream involves emulsion breaking to remove the tramp oils, filtration to remove particulates, and addition of fresh alkaline detergent as necessary, followed by reuse for automotive parts cleaning. In addition, another pollution prevention practice would be to monitor the types and kinds of parts which require cleaning for repair and determine how to prevent the part from breaking. By extending part life, the need for repair, and therefore cleaning needed prior to repair, would be reduced.

The waste reduction options identified at the Ft. Riley assessment are recycle/reuse options. A net savings in operating costs is anticipated to be $149,400 per year. It is also noted that the options recommended at Ft. Riley may be applied in at least 10 other U.S. Army FORSCOM installations.

Naval Undersea Warfare Engineering Station

The waste minimization opportunity assessment conducted at the Naval Undersea Warfare Engineering Station (NUWES), Keyport, Washington, is a result of a cooperative effort with the Naval Energy and Environmental Support Activity (NEESA) of Port Hueneme, California, and EPA. Several departments at NUWES Keyport are involved in an ongoing waste minimization program regarding the design and testing of torpedoes. The areas at the Station studied in detail during the assessment are: the maintenance of torpedoes, and the major waste generating activity consisting of defueling, disassembling, cleaning, reassembling, and refueling of torpedoes. The waste materials at these areas include: solids, liquids, sludges, solvents, and oils that are contaminated with Otto fuel, as well as diethylene glycol (DEG), Agitene, and cyanide compounds. Waste minimization options were also recommended for contaminated solids and liquids, used engine oil, used hydraulic fluid, and waste mineral spirits. The waste minimization options under consideration for NUWES Keyport are being evaluated for technical and economic feasibility.

These three DoD waste minimization assessments represent the importance of conducting waste minimization assessments and identifying opportunities for RD&D. Additional WMOA's will be conducted at DoD facilities as RD&D projects are identified and established.

DEPARTMENT OF VETERAN AFFAIRS

As part of the WREAFS Program, a waste minimization opportunity assessment case study was conducted jointly with the Department of Veteran Affairs at the Cincinnati Veteran's Medical Center. The purpose of the case study was to assess the opportunity for waste minimization of disposable medical supplies in a hospital setting and to identify RD&D opportunities for pollution prevention. At the Cincinnati facility, we studied medical waste derived from the diagnosis, treatment or immunization of patients.

The VA-Cin Medical Center segregates its waste so as to minimize the amount transported by the waste hauler and this practice was valuable in the conduction of the assessment and determination of recommendations. The study incorporated a "mass balance" approach to waste minimization and targeted waste generation areas for more detailed study. VA-Cin officials were extremely cooperative in all phases of the study, from the initial discussions through the fulfillment of requests after the site visit was completed. Additional information was gathered through a literature review of professional journals at medical libraries.

The reasoning for using disposables in hospitals as opposed to recyclables includes cost, convenience, comfort, labor shortages/wages, space constraints, and health and safety factors. As a result of cost considerations, the VA-Cin Medical Center has not switched to paper/plastic products to replace the use of wovens in the hospital. The facility has access to a VA-operated laundry and continues to make use of that laundry. However, even within the VA-Cin, there has been a recent interest and increase in the use of paper gowns. The chief recommendation of this study is that hospitals need to continually review their lists of disposable medical supplies and determine which of these disposable supplies can be replaced with recyclables without sacrificing safeguards to protect patient and worker health and safety.

The case study also includes a chapter for identifying, discussing, and evaluating the feasibility of and for minimizing waste in the health care industry. The Department of Veteran Affairs has over 170 hospitals throughout the United States. Federal hospitals include the Public Health Service hospitals, military base hospitals and general hospitals, as well as other clinics and medical centers. This case study will be helpful in technology transfer of pollution prevention information to all of these Federal facilities.

DEPARTMENT OF TRANSPORTATION

The EPA and the U.S. Coast Guard have entered into a joint waste minimization opportunity assessment project at Governors Island, New York, where the Coast Guard is initiating waste minimization efforts. Governors Island can be viewed as a microcosm of government blended with industrial facilities. Waste minimization efforts will include: management support, supply and purchasing controls, hazardous waste tracking, personnel education, technology transfer, and managing small quantity generator locations. It is the plan of this project to serve as a model for initiating waste minimization at industry and government facilities throughout the country. The case study will include the WMOA and implementation of a management plan. Waste streams will include typical waste streams from painting, cleaning and stripping operations.

INDUSTRY ASSESSMENTS

Simultaneously with the assessments at Federal sites, EPA is conducting WMOA's at industrial facilities. The focus of these efforts has been on locating small and medium-sized facilities which may not have the immediate resources or expertise to do what is necessary to reduce their waste, and would benefit significantly from Agency support. Toward this goal, assessments have been conducted at a mini-photo lab and a truck manufacturing facility. Both hazardous and non-hazardous wastes are included in the assessments.

Details on the two assessments are provided below.

Mini-Photo Lab

After an assessment in August 1989, the assessment team identified five waste minimization options they considered applicable to the wastestreams of interest. Following is a brief description of these options.

Option 1 - Wash Water Control - Wash water is used for color film development and the B&W paper process. The wash water is turned on each production day at approximately 7:00 a.m. and shut off at 7:00 p.m. Water use is therefore continuous during the day, however, production is not. The waste minimization option consists of a simple timer control system consisting of a switch, timer and solenoid valve. The operator would punch a button on the switch to activate the timer. In turn, the activated solenoid would allow water to flow for a preset time period.

Option 2 - Silver Recovery/Metal Replacement Cartridges - Silver is found (as light-sensitive silver halide) in spent photographic chemicals and wash waters as a result of removing the emulsion on films and papers. A metal replacement cartridge is a widely-used device for silver recovery. It can be used alone or in conjunction with other recovery technologies. In this case, the spent process solutions which contain significant amounts of silver would be plumbed to a single pipe. Two cartridges would be used to allow for high capacity while maintaining a high recovery rate.

Option 3 - Silver Recovery/Electrowinning - An electrowinning unit passes a direct current through a concentrated silver solution from anode to cathode causing the silver to plate out onto the cathode in nearly pure metallic form. A wide range of equipment is commercially available for electrowinning. Using manufacturer's literature as a basis, it is expected that up to two batches (4 gallons each) can be treated each day. During the average batch, 1.13 troy oz. of silver would be recovered within 4.5 hours.

Option 4 - Silver Recovery - This option is based on using the electrowinning device in Option 3, with metal replacement cartridges used to polish the effluent. The average effluent will be desilvered from 500 mg/l to approximately 10 mg/l, using only one cartridge.

Option 5 - Bleach Fix Recovery - The recommended method for bleach fix recovery is desilvering with two metal replacement cartridges. This requires three steps: 1) silver recovery, 2) restoring bleaching ability by aerating ferrous-EDTA complex to oxidize back to ferric-EDTA, and 3) replenishment of chemicals lost through carry-over with the film or paper. Approximately 75% of the recovered bleach fix solution can be reused while 25% should be discarded to prevent contaminant build-up.

Total capital investment, net operating cost, and payback period for each option are shown in Table 2. The owner of the lab has received a copy of the final assessment report and is taking the recommended options under advisement.

TABLE 2. SUMMARY OF MINI-PHOTO LAB WASTE MINIMIZATION OPTIONS

WASTE MINIMIZATION OPTION	TOTAL CAP. INVESTMENT, $	NET OP. COST SAVINGS, $/YR	PAYBACK PERIOD, YR
Wash Water Control	$ 675	$1,436	0.47
Silver Recovery Using Metal Replacement Cartridges	1,071	1,325	0.81
Silver Recovery Using Electrowinning	3,510	1,414	2.48
Silver Recovery Using Electrowinning with MRC Tailing	3,667	1,757	2.08
Recycle of Bleach Fix and Silver Using MRCs	1,571	2,508	0.63

Truck Manufacturer

This truck manufacturing facility produces 34 trucks (tractor-trailer) per day. The production processes are primarily assembly and painting. The current quantities of generated wastes and the associated disposal costs for the first three quarters of 1989 are given below:

	Amount (lb)	Cost of Disposal
Waste Paint	184,860	$12,957
Pretreatment Sludge	71,020	$ 9,134
Undercoating	3,375	$ 2,560
Degreasing Solvent (Chlorinated)	13,060	$ 5,431
Used Oil	28,275	$ 105
Paint Sludge	474,960	$15,132
Housekeeping	3,800	$ 1,428

The above figures represent a sharp decrease from recent years. The facility has instituted a number of waste minimization measures and cost reduction methods related to good waste management practices.

A site visit was conducted in January 1990 to begin the assessment. Although this facility has made major strides in waste minimization, the assessment team feels there are additional opportunities which may have significant impact. The following are targeted areas which will be investigated further throughout the assessment and feasibility phases.

Spray Painting - Air-assisted airless spray equipment is used for most spray painting. This method is a distinct improvement over conventional compressed air spray painting, however, alternatives exist which may improve transfer efficiency. Increasing the transfer efficiency reduces the volume of paint used and reduces volatile organic carbon (VOC) emissions.

Phosphating - An automated phosphating (conversion coating) process and electro-coat (E-coat) is used for small and medium-sized parts. This line consists of several processing and rinsing steps. The rinse water is piped to a chemical treatment plant where it is combined with paint booth wastewater. The resultant sludge is disposed as a hazardous waste.

It may be possible to avoid waste treatment of the phosphating rinse water by using an ion exchange recycle system, thereby also reducing water usage. Furthermore, the current wastewater treatment process, which uses large amounts of ferric chloride, may be altered, resulting in reduced sludge generation.

Degreasing of Rail Frames - The rail frame, or chassis, is degreased prior to spray painting using a chlorinated solvent (90% 1,1,1,-trichloroethane/10% methylene chloride). The spent solvent is distilled (350-400 gallons per day) and reused. Waste minimization options may include chemical substitution, procedural changes, or improvements to the recycle process.

The assessment team is completing the feasibility phase and a draft report is expected in May 1990.

CHURCH ASSESSMENT

This study of a church facility looked at daily office operations, special functions, general maintenance and an on-site pre-school. As would be expected, churches are not normally large waste sources, however, they are a tremendous source of social awareness. It is anticipated that this assessment and suggestions for waste minimization will result in wide-spread distribution through the church's governing bodies and congregation. This information will impact not only other churches, but also people's activities at home and at work.

The location of the church assessment was the Mt. Washington Presbyterian Church (MWPC) which is about fifteen miles east of downtown Cincinnati. With a 1990 budget of $615,000 and a $3,000,000 renovation and expansion project, this 2,000 member church represents a substantial institutional facility. The church has a very aggressive Recycling Committee which has been active in collecting recyclable material.

The site visit was made in December 1989. The specific areas of concern included building and grounds maintenance, pre-school, social activities, kitchens, administrative offices, and new building expansion.

Predictably, the largest waste generated by the church is white paper. However, there are numerous other cleaners, paints, lawn materials (e.g., weed killer), etc., that are used in significant quantities. The final report describing waste minimization options is expected to be available by the summer of 1990.

NEW JERSEY ASSESSMENTS

A pilot project with the New Jersey Department of Environmental Protection (NJDEP), entitled "Assessment of Reduction and Recycling Opportunities for Hazardous Waste (ARROW)," will allow the State to evaluate waste minimization techniques and conduct assessments at approximately thirty facilities within New Jersey. The objective of the site selection is to cover ten industries (three sites in each) to develop industry-specific information through the assessment activities.

Through a subcontract with NJDEP, the New Jersey Institute of Technology (NJIT) is locating sites and performing the assessments by following the EPA-recommended procedure outlined in the EPA manual. Participation in the program by facilities is on a voluntary basis. To date, response to the program has been enthusiastic and 14 companies are lined up for assessment work. Four site visits have been completed and the assessment reports are being prepared. Brief descriptions of two of the companies visited and potential waste minimization options follow below.

Nuclear Power Generation Facility

Interestingly, the bulk of the wastes from this electrical power generation facility is from construction and maintenance activities when power generation is shut down. Three major sources of waste streams were identified by the assessment team: operations, maintenance, and site services. After analysis of costs and waste generation quantities, the assessment team targeted opportunities for reduction in the levels of off-spec materials and containers of partially used materials which go to waste treatment and disposal. Several waste reduction options were identified, such as improved project estimation and planning of material procurement, dispensing, and stocking; incentives to contractors for waste reduction; and improved security to protect against wastes imported to the site.

Graphic Controls

This facility manufactures pens and markers for automatic recording devices and inks for use in these devices. The waste generation data indicate that the operation for ink formulation and preparation contribute to the bulk of the hazardous waste generation. Some options leading to reduced waste generation include reduction in quantities of rinse water used in the cleaning of equipment; improved scheduling of colors and types of batches of inks to reduce cleaning between batches; increased use of mechanical cleaning of tanks to supplement water cleaning; and changes in ink preparation procedure such as the utilization of a large ink base which could be tinted to the appropriate color in smaller batches as the need arose using small amounts of tinting color.

NJIT continues to work with facilities who show a strong interest in waste minimization and have volunteered to participate in the ARROW program. This effort will continue through August 1991.

TECHNICAL ASSISTANCE CENTERS

In 1988, a pilot project to assist small and medium-sized manufacturers in initiating hazardous waste minimization programs was begun through a cooperative agreement with the University City Science Center (UCSC) in Philadelphia, Pennsylvania. The need for these centers is based on the recurring problem, as stated previously, that for many smaller industrial facilities there is a lack of in-house expertise or resources required to start a waste minimization program. However, a small amount of technical assistance in the form of an initial waste minimization assessment can lay the foundation for a permanent program. The pilot project provides such assessments at no out-of-pocket expense to the client manufacturer. Waste Minimization Assessment Centers (WMAC's) were established at the University of Tennessee in Knoxville and at Colorado State University in Fort Collins during the first year of the project. A third WMAC was instituted at the University of Louisville in Kentucky in 1989.

Two examples of completed assessments involve an automobile bumper refinishing plant and a paint and coatings manufacturer. These facilities are described below.

Facility A - Automobile Bumper Refinishing

Refinished automobile bumpers (steel, aluminum, and plastic) are the chief products of this plant, which operates for 52 weeks per year and spends almost $15,000 per year to treat and dispose of its wastes. Those costs would be considerably higher if this plant, which was built only 3-4 years ago, had not incorporated certain features to aid in hazardous waste management into its basic design. The WMAC team therefore faced a more difficult challenge in further reducing hazardous waste emissions. For example, the design of this plant had eliminated direct drains from production areas to the sewer, had surrounded certain chemical tanks with dikes so that any spillage or overflow would be channeled to a central sump pump, and had taken other precautions to reduce migration from spillage, such as locating tanks below ground level.

In general, raw materials (used bumpers) follow one of three possible paths in this plant:

- Steel bumpers are straightened and cleaned before being plated with nickel and chromium.
- Aluminum bumpers are straightened and cleaned before being re-anodized (off-site).
- Urethane bumpers (plastic) are treated to remove paint before being repaired and repainted.

The direct focus of the WMAC team was on the first two because they account for the bulk of the production and virtually all of the hazardous waste generated at this plant. For metal bumpers, the production level averaged almost 16,000 per year, and about 80% of that was steel.

Steel Bumper Refinishing

After being straightened, the steel bumpers are prepared for refinishing by soaking in hydrochloric acid to remove old plating and then rinsed before immersion in metal cleaning solution (caustic and sodium silicate), polishing, and grinding. Then the bumpers are put through the plating line, where they are successively soaked in a dilute cleaning solution and a sodium fluoride acid soap solution with intermediate rinses, before being electrolytically replated with nickel first and then with chromium. A drag-out tank reduces liquid carryover from plating, and deionized water is used for multi-stage countercurrent rinsing.

This sequence of operations includes several steps already adopted by the plant to reduce the quantity of waste generated, such as:

- Air agitation to assure good circulation in the rinse tanks and to lower the volume needed.
- Deionized water for making process solutions and for rinsing, because otherwise the calcium and magnesium in the water supply would add to the amount of sludge formed.

- Less toxic trivalent chromium in the plating solution to lessen the concentration (weight of chromium per unit volume) and reduce treatment costs.

- Drag-out tanks to capture most of the solution carried out of the plating tanks before it reaches the rinse. When metal concentration in the drag-out increases over a period of time, the solution is recycled to the plating tank (for chromium) or sent to a holding tank (for nickel), where it is heated to decrease its volume by evaporation.

- Multi-stage countercurrent rinsing (rather than a continuous flow) so that the bumpers are first placed in the most contaminated stage and then the cleanest stage last.

- Continuous filtration of the chromium and nickel plating solutions to remove solid contaminants and allow the filtrate to be returned to the plating tanks.

Periodically the cleaning solutions and the rinse tanks are dumped into a sump and transferred to a storage and evaporation tank. The metals are flocculated by adding sodium bicarbonate, and the resulting sludge settles to the bottom. The remaining liquid, after pH adjustment, has been hauled offsite for disposal while the sludge, with mixed metals, has been sent to a hazardous waste landfill.

Aluminum Bumper Refinishing

The potential for hazardous waste to be derived from aluminum bumper refinishing at this plant is considerably less than it is for steel. First, the amount of aluminum bumpers among the plant's raw materials is only about one-fourth of the quantity of steel ones. Second, only part of the overall refinishing occurs at this plant, and the operations which are carried out have generated less hazardous waste than refinishing steel.

To remove the anodized coating on the bumpers brought into the plant, they are first soaked in a tank of heated alkaline de-ruster. After rinsing with tap water, the aluminum bumpers are immersed in a de-smut tank and then rinsed again with tap water. Aluminum bumpers are then re-anodized at another location.

Spent solutions and rinse water containing suspended solids are accumulated in a sump, from which they are pumped periodically to a storage and evaporation tank.

Three recommended waste minimization opportunities (WMO's) will, if implemented, save about half the current hazardous waste management costs at this plant. They are summarized in Table 3 with emissions reduction, savings and costs.

TABLE 3. SUMMARY OF WASTE MINIMIZATION OPTIONS - FACILITY A

Present Practice	Proposed Action	Cost Savings
Rinse water and other liquid streams are collected and treated with sodium bicarbonate to precipitate most of metals as sludge. Resulting liquid has nickel content less than 50 mg/l and chromium content below 5 mg/l. POTW requires less than 2.52 mg/l of nickel and less than 2.77 mg/l of chromium. Volume = 84,600 gal/yr.	Use additional filtration and existing deionization systems to reduce chromium and nickel levels to acceptable limits and to assure quality of water for recycle to plant. Add small additional solid collected to hazardous waste going to landfill for disposal.	Est. waste reduction = 84,600 gal/yr Est. cost reduction = $3910/yr Incre. operating cost = $258/yr Incre. cost of solid waste = $27/yr Net cost saving = $3625/yr Est. content less than 50 mg/l Simple payback = about 15 mo.
Sludge from precipitation of metals is combined with residue from filtration of plating solutions and sent to hazardous waste landfill. Weight = 5500 lb/yr	Dewater the sludge by heating it. Continuous dewatering is possible by loading the sludge into a hopper and feeding it by an auger to a burner tube fueled by natural gas or LPG. The weight of hazardous waste sent to the landfill will be reduced.	Est. waste reduction = 3874 lb/yr Est. cost reduction = $2964/yr Incre. operating cost = $50/yr Net cost saving = $2914/yr Est. implementation cost = $10,000 Simple payback = 3.4 year
Tap water is used freely to rinse aluminum bumpers after they are stripped of anodized coating. This rinse is combined with other liquids and the total is sent for landfill disposal.	Constrict the flow of tap water from 6 to 3 gal/min. If a higher pressure water stream is needed, substitute a wand spray gun. Then a booster pump will be needed, but the flow can be reduced to about 0.6 gal/min.	Est. waste reduction = 8246 gal/yr Est. cost reduction = $1039/yr (based on cost to haul liquids to landfill) Est. implementation cost = under $10 Simple payback less than 1 month Cost of Booster pump (1/2 hp) = $300 Cost reduction = $1860/yr Est. operating cost = $60/yr Simple payback = 2 months

Facility B - Paints and Coatings Production

This plant produces paints, coatings, stains, and surface-treating products at an overall rate of about 1.1 million gallons per year for regional distribution on a schedule of 2080 hours per year for 52 weeks. Its operations primarily involve blending and mixing of raw materials, followed by product testing and packaging and by cleaning of vessels and lines. Color separation in the product is obviously important, and each lot must meet a variety of other customer specifications.

Individual lots of water-based and solvent-based paints are mixed in tanks from 200 to 1,000 gallons capacity. Ingredients for this initial step include (for water-based) water, latex, resins, extenders, and dispersed pigments. For solvent-based paints the materials are generally similar in type, but obviously solvent replaces water and latex, and the other new ingredients include plasticizers, tints, and thinners.

After batches are made up they are transferred to so-called let-down tanks, where additional water (or solvent), resins, preservatives, anti-foaming agents, thinners, and bactericides are added. Testing of batches encompasses at least color, viscosity, and gloss, and those lots which meet specifications are filtered and charged to cans for labeling, packaging, and shipping.

Hazardous Waste Generation

The principal waste streams are the result of equipment cleaning, especially from water-based paints. For example, rinsing the let-down tanks ordinarily requires 35 gallons of rinse water, but that value increases to 53 gallons if light paint is to be blended after a dark predecessor. The hazardous nature of water rinses is due to mercury from the bactericide in the paint.

In some instances, rinse water fror the mixing tanks is held in 500-gallon tanks and used in the let-down tanks (instead of fresh water) to formulate future batches of water-based paint. The rinses are separated according to the color intensity of paint in the tanks from which they were derived. For example, rinses from white paint formulation amount to about 70% of the total and they are invariably used again.

Waste rinses not used again are piped to holding and flocculation tanks. Alum is added to lower the pH and some solid is precipitated by adding flocculant. From this, supernatant liquid is removed for re-use in other paint formulations.

Tanks used for solvent-based paints are rinsed with mineral spirits at a rate of about 5 gallons/400-gallon tank. These washings are sent off-site for recovery, followed by recycling or sale as fuel.

In addition to re-use of rinse water and recovery of solvent, this plant has adopted the following measures to reduce waste generation:

- Cleaning equipment before paint dries and hardens.

- Eliminating hazardous materials, except for mercury in the bactericide added to outdoor water-based paint.

- Avoiding hazardous container waste by purchasing the bactericide in water-soluble bags which dissolve during paint formulation.

- Scheduling batch formulations so that light ones precede dark ones and thereby reduce the total volume of rinses.

- Reducing the inventory of raw materials to avoid degradation and spoilage and to assure high-quality product that can be sold, rather than low-quality paint which adds to the burden of waste disposal.

- Using bag filters to collect dust.

Summary of Recommended Waste Minimization

Table 4 offers a brief description of each recommended WMO and of current plant practice, together with savings and cost data. Together, the three WMO's recommended could save over $22,000 per year, which represents about 25% of current waste management costs. Each simple payback time is less than one year.

CONCLUSION

This paper describes several waste minimization success stories arising from the EPA's pollution prevention research program in Cincinnati, Ohio. The programmatic approach has been to go to other Federal agencies and industry to determine the manual's implementation and to transfer technical pollution prevention impacts throughout these communities, especially to small and medium-sized businesses which may not otherwise have the resources to pursue pollution prevention initiatives on their own. Furthermore, it is clear that EPA's program has focused on practical approaches to already existing processes and facilities. Such an approach begs the question: What about the future?

EPA's assessment program will continue to aid in the establishment of a knowledge pool of individuals technically-oriented to pollution prevention. The assessment process is becoming an integral part of business management practices, much as safety concerns have become routine. Beyond these assessments, the Agency's pollution prevention research programs must turn to identifying clean practices, clean products and processes. With the cooperation of representatives from the Federal and private sectors, EPA anticipates broad potential for research in alternative technologies and products that lower risks to the environment and our future heritage.

TABLE 4. SUMMARY OF WASTE MINIMIZATION OPTIONS - FACILITY B

PRESENT PRACTICE	PROPOSED ACTION	COST SAVINGS
Water rinses remove paint tanks and pipes	Install a pipe-cleaning system consisting of 3 different-sized foam plugs or "pigs" to be sent throughout the pipes by compressed air. Paint is thus forced from the lines and to the canning line filter. The use of water and amount of waste are lower. (This WMO is applicable to non-white paints.)	Est. waste reduction = 1,780 gal/yr Est. cost reduction = $11,110/yr Est. implementation cost = $1,600 Simple payback = 2 months
About 15 gal solvent batch of paint is drummed and sent off-site for disposal.	Use a solvent recovery system based upon distillation and ship the small amount of remaining solid to a hazardous waste disposal site.	Est. waste reduction = 3,300gal/yr2 Est. cost reduction = $5,420/yr Est. implementation cost = $4,950 Simple payback = 11 months
A bactericide containing mercury is being used in water-based paints.	Eliminate the bactericide from water-based interior paints and substitute an organic material. (This WMO is applicable to non-white paints.) There is no cost difference between these additives.	Est. waste reduction = $3,100 gal/yr Est. cost reduction = $5,580/yr Est. implementation cost = none Simple payback = immediate

January, 1991

POLLUTION PREVENTION RESEARCH BRANCH

CURRENT PROJECTS

Risk Reduction Engineering Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

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PROJECT DESCRIPTIONS

Clean Products

Processes Research

Technology Transfer

Recycling

Socioeconomic

INTRODUCTION

This publication contains one page summaries of recently completed and currently active projects sponsored by the ***Pollution Prevention Research Branch*** at the U.S. EPA's Risk Reduction Engineering Laboratory in Cincinnati. The PPRB is responsible for supporting projects that develop and demonstrate clean production technologies, clean products, and innovative approaches to reducing the generation of pollutants in all media. Many of these projects are carried out cooperatively with State agencies, universities, and other environmental research organizations. The FY 91 budget for the Branch is approximately $2.6 million.

It is our intention to update this publication every six months to reflect program additions or changes. The reader is encouraged to contact the EPA Project Officer listed for more information about any of the projects contained in the publication.

Harry M. Freeman
Chief
Pollution Prevention Research Branch

January, 1991

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PROJECT TITLE: CLEAN PRODUCTS BACKGROUND INFORMATION

EPA PROJECT OFFICER: Mary Ann Curran (513) 569-7837

PRINCIPAL INVESTIGATOR: Marjorie Franklin (913) 649-2225
Franklin Associates, Ltd.
4121 W. 83rd St., Suite 108
Prairie Village, Kansas 66208

PROJECT DESCRIPTION:

The objective of this project was to identify, collect and summarize available information on the subjects of clean products, methodologies for comparative evaluations of products to determine "environmental friendliness," environmental labeling programs and methodologies for life-cycle analyses (both environmental impacts and costs related thereto) of products.

Published and unpublished information plus information from other appropriate sources have been gathered and succinctly summarized. The quality of the information gathered has been judged to the extent possible. The results are being used, for example, to help in identifying specific research needs in the clean products area.

TIME PERIOD: 12/15/89 - 6/30/90

PUBLICATIONS, PAPERS TO DATE:

"Background Document on Clean Products Research and Implementation," EPA/600/2-90/048, NTIS Accession No. PB91-108977 ($17.00)

FUTURE OUTPUTS: Project completed 12/31/89

PROJECT TITLE: EVALUATING THE POTENTIAL FOR SAFE SUBSTITUTES

EPA PROJECT OFFICER: Mary Ann Curran (513) 569-7837

PRINCIPAL INVESTIGATOR: Gary Davis (615) 974-4251
University of Tennessee
Knoxville, TN 37996

PROJECT DESCRIPTIONS:

This project, which is being conducted under a cooperative agreement with the University of Tennessee's Waste Management Research and Education Institute, is evaluating potential substitutes for products that are either toxic in and of themselves, or rely upon toxic chemicals in their production.

The approach is to first identify priority products, including consumer products, industrial chemicals and pesticides, for evaluation. Then existing substitutes will be identified for each product and evaluated. Evaluations will be based on potential successful application or possible technical impediments that may exist. Case studies of successful substitutes will be documented along with any identified research needs in this area. The results will be presented in a background document.

The project is in the first phase of activity which is the selection of priority products. Product selection began with the identification of priority chemicals. These chemicals will then be traced to the products and processes in which they appear. The priority chemical list includes the 17 compounds targeted by the Agency for action under the Industrial Toxics project. An additional 7 chemicals selected from the TRI database and 5 pesticides were added to the list.

TIME PERIOD: 8/27/90 - 9/9/93

PUBLICATIONS, PAPERS TO DATE:

Curran, M. A., "A New Source Reduction Project: The Potential for Safe Substitutes", paper November 1990, Household Hazardous Waste Conference, San Francisco, CA.

FUTURE OUTPUTS:

	Identification of Priority Products	11/90
	Report on Existing Substitutes	1/92
	Final Background Document	12/93

PROJECT TITLE: CLEAN PRODUCTS CASE STUDIES

EPA PROJECT OFFICER: Anne Robertson (513) 569-7658

PRINCIPAL INVESTIGATOR: Bette Fishbein
INFORM, Inc.
381 Park Avenue South
New York, NY 10016
(212) 689-4040

PROJECT DESCRIPTION:

This project involves two studies on clean products. The aim of this project is to identify and provide in-depth case studies of corporate initiatives that have resulted in 1) cleaner products through the reduction of raw materials used in production, the reduction of toxics used in production, and/or the extension of the life of the product and 2) products that are less toxic. The primary criterion for selecting cases for Study I is the potential for reducing the weight and or volume of material entering the solid waste stream. Study II focuses on product classes that utilize large amounts of hazardous wastes in their manufacture or that result in significant public health or environmental impacts from their use or disposal. In addition, failed attempts to develop cleaner products by either a corporation or an industry are being identified, and the reasons for their failures are being explored.

Each study includes seven to ten cases. For most of the case studies, INFORM is concentrating on U.S. corporations, however, for two or three of the studies the focus is on corporations in Europe (either multinationals or European companies). INFORM is conducting in-depth investigations for each case study which include review of the pertinent literature and detailed interviews with key corporate, engineering, design, planning, and marketing staff. INFORM is examining the genesis of the source reduction effort, the corporate culture or organizational factors that contributed to the success of the effort, the technical and economic issues, the marketing and public education strategies, the transferability of the project results, and the mistakes that were made and the lessons that were learned.

A final report will be produced for each of the two projects. A combination of public education tools will be used to disseminate the findings of this research effort including media outreach to announce the publication of the reports, marketing of reports through direct mail, generation of print stories for magazine and newspaper publication, and participation in public forums to disseminate the information gathered during this research project.

TIME PERIOD: 10/90 - 12/92

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

Report, "Case Studies of Source Reduction in the Production of Products"	7/92
Report, "Case Studies of Reduction of Chemical Hazards in Products"	4/93

PROJECT TITLE: COMPARATIVE RISK OF CONSUMER PRODUCTS FOR POLLUTION PREVENTION

EPA PROJECT OFFICER: Mary Ann Curran (513) 569-7837

PRINCIPAL INVESTIGATOR: Bruce Vigon (614) 424-4463
Battelle
505 King Ave
Columbus, OH 43201-2693

PROJECT DESCRIPTION:

Growing concern about the ecological impacts that products and processes have on the environment has led to an increased interest in life cycle analysis (LCA). LCAs examine the energy and raw material inputs and the pollutant outputs associated with a product from its inception to its final disposal. LCAs are sometimes described as cradle to grave studies.

LCAs have been conducted for more than 20 years but only to a limited extent. Because LCAs have not been used widely, a lot of variance and inconsistencies exist in the methodologies that are currently used to perform LCAs. In response to the lack of uniformity in LCAs, EPA has launched a research project that will produce guidelines for standardizing LCAs.

EPA is pursuing research that will lead to a standardized LCA methodology. One of the research initiatives funded by the Administrator's 2% Set-Aside program for pollution prevention is a joint effort by OAQPS and OSW that focuses on LCA. This effort is being combined with one that ORD has already begun on the inventory portion of an LCA. This project will produce a recommended methodology for conducting an inventory. In addition, this project will begin to scope out the impact assessment portion of the LCA and will begin to develop a strategy to communicate LCA methodology to potential users.

In order to produce a methodology that will be of maximum use to the public, EPA has assembled a peer review group to provide input throughout the research period. This group is comprised of representatives from academia, industry, state and federal governments, consulting firms, and environmental groups who have expertise in areas related to LCA. This group met for the first time in November. At this meeting the group was presented with an overview of EPA's LCA research program and was given an opportunity to comment on the initial outline for the inventory methodology.

TIME PERIOD: 8/90 - 1/92

PUBLICATIONS, PAPERS TO DATE:

Curran, M. A., "EPA's Clean Products Research Program: Views and Expectations", paper presented at SETAC Product Life Cycle Assessments Workshop, Smugglers' Notch, Vermont, August 19, 1990.

FUTURE OUTPUTS:

Final Inventory Report	12/91
LCA Impact Assessment Report	12/92
LCA Stream-lined Method	12/92
Communication Strategy	12/92

PROJECT TITLE: PRODUCT AND PROCESS DESIGN FOR LIFE-CYCLE RISK REDUCTION AND ENVIRONMENTAL IMPACT MITIGATION

EPA PROJECT OFFICER: Mary Ann Curran (513) 569-7837

PRINCIPAL INVESTIGATOR: Greg Keoleian (313) 764-1412
School of Natural Resources
University of Michigan
2540 Dana Bldg.
Ann Arbor, MI 48109-1115

PROJECT DESCRIPTION:

Product and manufacturing process designers play a central role in controlling risks and environmental impacts in the life cycle of a product. Responding to public concern, manufacturers are beginning to make adjustments in their products in an effort to achieve "environmentally-safe" products. For example, plastic containers are being reformulated to contain increasing amounts of recycled plastic content. Many changes still need to be made, but a life-cycle framework is necessary in order to allow designers to analyze multiple impacts simultaneously. For instance, enhancing the durability of a product may require a heavier gauge construction and, thus, more input raw materials and more waste materials when the end-product is discarded. Manufacturers and consumers want improved products, however, no guidance exists that can assist manufacturers in evaluating product and process design to identify opportunities for improvement.

This project, being conducted under a cooperative agreement with the University of Michigan's School of Natural Resources, is providing product and process designers with such a methodology in the form of a guidance manual. The methodology will assist in developing new products or modifying existing products to minimize cumulative life-cycle risks and environmental impacts. The procedure is being prepared in the form of a systematic guide that can be applied in self-evaluation.

The University is developing the guidance manual in the first year of the project. The manual will then be applied at two case studies in the following two years of the project. The sites for the case studies have not been determined.

TIME PERIOD: 2/91 - 2/94

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

	Final Guidance Manual	6/92
	Interim case study report	6/93
	Final case study report	6/94

PROJECT TITLE: EXAMPLES OF CLEAN TECHNOLOGIES

EPA PROJECT OFFICER: Anne Robertson (513) 569-7658

PRINCIPAL INVESTIGATOR: Joe Tillman (513) 723-2600
SAIC
635 West Seventh Street
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Cincinnati, OH 45203

PROJECT DESCRIPTION:

This project is producing a report on examples of clean technologies in the U.S. The goal of this project is to provide a concise report that illustrates some of the initiatives that industry has taken to implement technologies that reduce waste. This report can be used to illustrate clean technologies and to encourage other industries to use clean technologies.

Twenty examples of clean technologies in ten industries have been identified. For each example a two page write-up is being prepared. Each write-up contains a description of the company, an overview of the waste reducing technologies that the company has implemented, and a summary of the amount of waste that has been reduced and in many cases the amount of money that has been saved. Each write-up also lists a contact person at the company. Pictures and diagrams are being obtained for each write-up to further illustrate the technologies that are being used by these companies.

TIME PERIOD: 8/90 - 3/91

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Final Report 8/91

PROJECT TITLE: NEW JERSEY/EPA WASTE MINIMIZATION ASSESSMENT PROGRAM

EPA PROJECT OFFICER: Mary Ann Curran (513) 569-7837

PRINCIPAL INVESTIGATOR: Kathy Pomeranz (609) 292-8341
State of New Jersey
Department of Environmental Protection
401 E. State Street
5th Floor CN-028
Trenton, NJ 08625

PROJECT DESCRIPTION:

This project is designed to evaluate the use of waste minimization assessments in thirty hazardous waste generating facilities (across ten industries) in New Jersey. The assessments are being initiated by the New Jersey Institute of Technology (NJIT) personnel and will follow the EPA-recommended procedure outlined in the Waste Minimization Opportunity Assessment Manual (EPA/625/7-88/003). NJDEP refers to the project as "Assessment of Recycling and Recovery Opportunities for Hazardous Waste (ARROW)."

Initial industries being studied include:

1) Electrical Power Generation
2) Graphics Control Manufacturing
3) Paints and Coatings Manufacturing
4) Printing
5) Lubricant Production
6) Transportation Vehicle Maintenance
7) Leather Finishing
8) Educational Facilities.

Ten assessments have been completed. Sites for the remaining 20 assessments have been identified.

TIME PERIOD: 9/1/88 - 3/31/92

PUBLICATIONS, PAPERS TO DATE:

1. Curran, M.A., J.S. Bridges, K.R. Stone and B.A. Westfall, "The EPA Waste Minimization Assessment Research Program: An Overview," paper, March 1990, AICHE Spring Meeting, Orlando, Florida.

2. Curran, M.A., and K. R. Stone, "Evaluation of EPA Waste Minimization Assessment, " paper, April 1990, EPA Research Symposium, Cincinnati, Ohio.

FUTURE OUTPUTS:

30 Project Summaries (assessments)	3/90 - 3/92
1 Final Report	3/92

PROJECT TITLE: RESEARCH STRATEGY BACKGROUND DEVELOPMENT

EPA PROJECT OFFICER: Ivars J. Licis (513) 569-7718

PRINCIPAL INVESTIGATOR: Dr. Herbert Skovronek (201) 599-0100
Science Applications International Corp.
8400 Westpark Drive
McLean, Virginia 22102

PROJECT DESCRIPTION:

This project is part of a technical support task funded in FY 89 with the objective of developing a basis for assigning research priorities to work performed within the Process Engineering Section of the Pollution Prevention Research Branch. The Process Engineering Section is partly responsible for defining, establishing and carrying out a research program to enhance and accelerate the implementation of new pollution prevention technologies available at full- or pilot-scale and helping state and local government programs in this area. It is also charged with speeding the development of new technologies and participation in the identification of future pollution problems and designing anticipatory research programs to assist in the development of new technology that will help to avoid these problems.

In order to best prioritize research efforts within a limited budget, this project was designed to gather information on the pollution problems in existence, the new technologies available or being developed and the perceived relative importance of both problems and opportunities. The prioritization activity resulted in a list of 17 Standard Industrial Classification (SIC) areas, plus a number of ideas for generic research needs. Several drafts of this information have been prepared and the resulting final draft is scheduled for completion by 3/91.

The SIC areas identified have been used as part of planning for a Clean Technology, workshop/manuals series to be presented at Regional Offices under a 2% Set-aside program with CERI, as well as general project planning of pollution prevention research activities for purposes of focusing research effort.

TIME PERIOD: 6/89 - 9/91

PUBLICATIONS, PAPERS TO DATE:

Licis, Ivars J., "Pollution Prevention Strategic Challenges and Opportunities for the 1990's", paper, to be presented and printed in proceedings for 17Th Annual RREL Symposium, April, 1991.

FUTURE OUTPUTS: "Industrial Pollution Prevention Opportunities for the 1990's" 8/91

PROJECT TITLE: NEW JERSEY/EPA WRITE PROGRAM

EPA PROJECT OFFICER: Johnny Springer, Jr. (513) 569-7542

PRINCIPAL INVESTIGATOR: Dr. Mohamed Elsaady (609) 292-8341
New Jersey Department of Environmental Protection
401 East State Street
5th Floor West CN-028
Trenton, New Jersey 08625

PROJECT DESCRIPTION:

Technical and economic evaluations are being conducted on manufacturing and processing operations in which waste minimization technologies reduce the volume and/or toxicity of wastes generated. The objectives of the project are to: establish reliable performance and cost information on pollution prevention techniques by conducting evaluations/demonstrations, encourage active participation of small and medium-sized companies in evaluating and adopting pollution prevention concepts, encourage transfer of knowledge and technology between large, medium, and small-sized firms and provide solutions to important chemical, waste stream and industry-specific pollution prevention research needs.

Plans are being made to perform a technology evaluation on a machining fluid recycling technology. This is a self-contained, completely mobile unit. The unit is designed to recycle machine cutting fluids, coolants and other types of liquid waste. Plans are being developed to evaluate the performance of the system on three different types of fluids.

The Quality Assurance Project Plan is in the final stages of development for a technology evaluation of the Zerpol "Zero Discharge" electroplating wastewater recovery system. This system makes possible the reuse of water and is targeted at the metal finishing industry.

Initial contacts have been made for the evaluation of an oil absorbent product that facilitates the recycling of oil and the evaluation of a CFC replacement in compressed air parts cooling.

TIME PERIOD: 8/14/89 - 8/13/92

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Final Technology Report 12/1/92

PROJECT TITLE: CALIFORNIA/EPA WRITE PROGRAM

EPA PROJECT OFFICER: Lisa M. Brown (513) 569-7634

PRINCIPAL INVESTIGATOR: Robert Ludwig (916) 324-2659
California Department of Health Services
Toxic Substances Control Program
Alternative Technology Division
400 P Street
Sacramento, CA 94234-7320

PROJECT DESCRIPTION:

The California/EPA Waste Reduction Innovative Technology Evaluation (WRITE) Program is now in its second year of technically and economically evaluating waste reduction technologies. California DHS is cooperating under a Memorandum of Understanding with EPA to identify at least five techniques for evaluation during this three year project.

In the first evaluation five technologies were examined at General Dynamics Pomona Division. The technologies and the type of waste reduction represented included (1) a computerized printed circuit board plating process with overhead spray rinsing (process substitution); (2) sulfuric acid anodizing system (process substitution); (3) robotic paint facility operations with a) proportional paint mixing (process substitution), b) water-based solvent replacement (product substitution), c) electrostatic paint sprays (process substitution), and d) solvent stills (recycling); (4) Freon recovery stills (recycling); and (5) bead-blast paint stripper (process substitution). The second evaluation was of an Advanced Reverse Osmosis System at the Sunnyvale, California Hewlett-Packard Facility. The effectiveness of the unit in recovering Watts nickel sulfate plating bath solution and rinse water as well as the economic evaluation of the system will be the report from this study (draft report is being reviewed). The third evaluation has just begun. It is a six-month evaluation of three bus oil filters at the Orange County Transit District in Garden Grove, California. The two major objectives of the testing are (1) to assess the performance of a reusable filter and (2) to determine if the rate of oil deterioration can be reduced.

TIME PERIOD: 6/30/89 - 6/30/92

PUBLICATIONS, PAPERS TO DATE:

Brown, L.M., Ludwig, R., and Erbas-White, I. "The Evaluation of an Reverse Osmosis System at the Sunnyvale, California Hewlett-Packard Facility", 17th Annual Hazardous Waste Research Sysposium, Cincinnati, Ohio, April 9-11, 1991.

FUTURE OUTPUTS:

General Dynamics Pomona Division Evaluation	8/01/91
Hewlett-Packard Reverse Osmosis Evaluation	8/01/91
Orange County Transit District Evaluation	12/01/91
Final Report	6/30/92

PROJECT TITLE: WASHINGTON/EPA WRITE PROGRAM

EPA PROJECT OFFICER: Ivars J. Licis (513) 569-7718

PRINCIPAL INVESTIGATOR: Robert Burmark (206) 438-7370
Washington State Department of Ecology
Office of Waste Reduction and Recycling MS PV-11
Olympia, Washington 98504

PROJECT DESCRIPTION:

This project will evaluate five pollution prevention technologies that are either implemented at full-scale at the present time or have been developed through relatively large scale and are to be implemented within the time frame of the study. The five technologies will be evaluated during a three-year project period. At the present time, one technology has been evaluated and is in the data analysis and reduction phase. Additionally, four candidate technologies have been identified, but their final suitability for the WRITE program as well as location of suitable test sites are in various stages of completion.

The first technology evaluation involves the recycling of acetone still bottoms resulting from the recycling of acetone used in cleaning operations in fiberglass boat building and fabrication of spas and shower stalls. An additional objective is to evaluate the effects of substitution with less toxic cleaners that eliminate the generation RCRA wastes. Wastes of this type are generated by a large number of relatively small fiberglass fabrication shops in the State of Washington and across the country, providing a significant amount of technology transfer potential.

Candidate technologies for the remaining four (4) evaluations include:

- recycling/reuse of baghouse dust from electric arc furnaces
- engine rebuilding technology improvements (solvent substitution, alkali wastewater elimination (physical cleaning methods such as ball-peening, sand, ice, CO2 blasting)
- sodium bicarbonate cleaning
- solvent substitution in various cleaning operations, using citrus based, or other designed new cleaners for specific applications.

TIME PERIOD: 6/16/89 - 6/15/92

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

"Acetone Recycling and Substitution in the Fiberglass Fabrication Industry"	9/91
"Recycling and Reuse of Electric Arc Furnace Dust"	12/91
"Solvent Substitution Applications for Engine Rebuilding"	1/92
"Sodium Bicarbonate Cleaning Substitution for More Toxic Methodology"	2/92
"Solvent Substitution in Selected Cleaning Operations"	5/92

PROJECT TITLE: CONNECTICUT/EPA WRITE PROGRAM

EPA PROJECT OFFICER: Lisa M. Brown (513) 569-7634

PRINCIPAL INVESTIGATOR:
Sumner Kaufman (203) 244-2007
Connecticut Hazardous Waste Management Service
900 Asylom Avenue, Suite 360
Hartford, CT 06105-1904

PROJECT DESCRIPTION:

The main objective of this cooperative agreement is to identify, develop, and evaluate innovative pollution prevention techniques through the cooperative efforts of CHWMS and EPA. Specifically, this cooperative program is exploring methodologies that, through engineering and economic assessments, have the potential of reducing the quantity and/or the toxicity of waste produced at the source of generation, or to achieve practicable on-site reuse or recycling of these waste materials. CHWMS in coordination with its state grant program is identifying at least five techniques for evaluation during this three-year project.

The first technology has been selected and the Quality Assurance Project Plan developed. The evaluation of an Automated Aqueous Rotary Washer at Quality Rolling and Deburring, Inc. has been scheduled for the week of March 11, 1991. Some of the objectives of this study include:

1. Demonstration of product quality.

2. Estimation of waste reduction potential.

3. Evaluation of ecomonics.

A comparison will be made with former cleaning techniques -- vapor degreasing, hand aqueous wash, and alkaline tumbling.

Candidate technologies for additional evaluations include:

- vacuum distillation process for closed loop chrome/nickel recovery

- ink recycling at a newspaper

- closed loop process for hexchrome/cadmium conservation

- process for recycling and reprocessing of dye wastes at a textile manufacturer

TIME PERIOD: 10/1/89 - 9/30/92

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

Project Report/Project Summary per technology evaluated

First draft report	5/91
Final Report	10/30/92

PROJECT TITLE: ILLINOIS/EPA WRITE PROGRAM

EPA PROJECT OFFICER: Paul M. Randall (513) 569-7673

PRINCIPAL INVESTIGATOR: Dr. Gary Miller (217) 333-8942
Hazardous Waste Research and Information Center
1 East Hazelwood Drive
Champaign, Illinois 61820

PROJECT DESCRIPTION:

This program is a joint effort between the EPA and the Hazardous Waste Research and Information Center located in Champaign, Illinois on the University of Illinois campus. The objective is to evaluate at least five (5) waste reduction technologies in Illinois industrial facilities over a three year program period.

The program has identified four pollution prevention technologies with associated companies willing to participate in the studies. The projects are: 1) water based inks as a substitute for solvent based inks in narrow-web flexographic printing [MPI Label systems]; 2) substitution of soy-oil inks for petroleum inks in an offset press [University of Illinois Office of Printing Services]; 3) substitution of alkaline zinc plating for zinc cyanide [P & H plating]; and 4) waste reduction by centralized evaporation of plating rinse solution [Graham plating]. A fifth project, recovery of zircon sand [American Foundrymen's Society] is in search of a suitable technology that will permit reuse of zircon sand in investment foundry molds. If no suitable technology is identified, an alternative project will be pursued.

At MPI Label systems, all project testing was completed. Preliminary results show solvent emissions to the air have been reduced per label run by over 80 percent at an annual cost savings of at least $ 16,500 per year. Final technical and economic results will be documented in a future report. In the P & H plating project, field testing has been completed and results are being compiled.

TIME PERIOD: 6/19/89 - 6/18/92

PUBLICATIONS, PAPERS TO DATE:

1. G.D. Miller, W.J. Tancig, P.M.Randall, "Illinois/EPA WRITE Program," presented at the International Conference on Pollution Prevention: Clean Technologies and Clean Products, Washington, D.C., June 12, 1990.

2. P.M. Randall, G.D. Miller, W.J. Tancig, M. Plewa, "Toxic Substance Reduction for Narrow-Web Flexographic Printing", to be presented at the 17th Annual RREL Symposium, April, 1991.

FUTURE OUTPUTS:

Final report and summary, MPI Label systems	11/91
Final report and project summary, P & H Plating	1/92
Research report, 3rd technology	4/92
Research report, 4th technology	6/92
Research report, 5th technology	9/92
Program final report and summary	12/92

PROJECT TITLE: MINNESOTA/EPA WRITE (WASTE REDUCTION INNOVATIVE TECHNOLOGY EVALUATION)

EPA PROJECT OFFICER: Teresa M. Harten (513) 569-7565

PRINCIPAL INVESTIGATOR: Cindy McComas (612) 625-4949
Minnesota Technical Assistance Program
420 Delaware St. S.E.
University of Minnesota
Minneapolis, MN 55455

PROJECT DESCRIPTION:

The objective of this project, which is funded by a cooperative agreement between EPA and the University of Minnesota, is to identify, implement, and evaluate innovative waste reduction technologies in the metal finishing industry. During the three year project period five technology evaluations, consisting of both engineering and economic analyses, are to be carried out at operating manufacturing facilities.

In the first 18 months of the project, the Minnesota Technical Assistance Program (MnTAP), the state organization charged with carrying out the program, publicized the WRITE program within the target industrial community, performed site visits at candidate industries, selected companies for conducting the first two evaluations and performed monitoring at the first facility. The company selected for the first evaluation was MICOM, Inc., a printed circuit board manufacturer located in the Minneapolis area. Specifically, waste reducing modifications, consisting of decreasing withdrawal rate and increasing drain time at an etchant bath and an electroless copper plating bath, were assessed. A report is being prepared and is scheduled for publication in mid 1991 describing the project.

The remaining technology evaluations are being performed cooperatively between EPA, MnTAP, and an external contractor; while EPA and MnTAP will select companies for these evaluations, the contractor will have primary responsibility for developing project test plans, data collection and analysis, and report writing. Under this new arrangement, testing will begin in the first quarter of 1991 at the company selected for the second evaluation, Hutchinson Technology, a manufacturer of flexible printed circuits.

TIME PERIOD: 7/1/89 - 6/30/92

PUBLICATIONS, PAPERS TO DATE:

"Waste Reduction at a Printed Circuit Board Manufacturing Facility Using Modified Rinsing Technology", Pagel, P., International Conference on Pollution Prevention: Clean Technologies and Clean Products, Washington, D.C., June 10-13, 1990.

FUTURE OUTPUTS:

First technology report	7/31/91
Second technology report	11/15/91
Third technology report	3/15/92
Fourth technology report	6/15/92
Fifth project report	10/30/92

PROJECT TITLE: ERIE COUNTY/EPA WRITE PROGRAM

EPA PROJECT OFFICER: Paul M. Randall (513) 569-7673

PRINCIPAL INVESTIGATOR: Mr. Paul B. Kranz, P.E. (716) 858-7897
Erie County Department of Environment and Planning
Division of Environmental Compliance Services
95 Franklin Street
Buffalo, New York 14202

PROJECT DESCRIPTION:

In May 1990, the Erie County Department of Environment and Planning (ECDEP) began a three year partnership with the EPA to identify and demonstrate waste reduction technologies in Western New York as part of the WRITE research program. Technical support is provided by Recra Environmental and the New York Center for Hazardous Waste Management. Two technologies and companies have been tentatively identified. They are substitution of water-based inks for solvent-based inks in wide-web flexographic printing [Lustreprint Co.] and carbon dioxide pellet blasting for paint stripping/coating removal [Pratt & Lambert].

Lustreprint is a manufacturer of flexible packaging used in the food and snack industry. The company has a goal to eliminate all hazardous emissions from the facility. This project is evaluating the conversion of a six (6) color wide-web press from using solvent-based to water-based inks. Several equipment retrofits are being evaluated including one that improves adhesion of water-based inks to a plastic film substrate.

Project plans have been submitted for review in January 1991. Testing and evaluation will follow after approval of final plans. Investigations continue of other potential industrial technologies and companies to eventually secure at least five technologies to be evaluated over the three year period.

TIME PERIOD: 5/1/90 - 4/30/93

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

Final report and summary, Lustreprint	2/92
Final report and summary, Pratt & Lambert	6/92
Final report and summary, 3rd technology	12/92
Final report and summary, 4th technology	2/93
Final report and summary, 5th technology	6/93
Program final report and summary	9/93

PROJECT TITLE: WASTE REDUCTION EVALUATIONS AT FEDERAL SITES (WREAFS) PROGRAM

EPA PROJECT OFFICER: James S. Bridges (513) 569-7683

PRINCIPAL INVESTIGATOR: Gary Baker (513) 723-2611
SAIC
635 West Seventh Street, Suite 403
Cincinnati, Ohio 45203

PROJECT DESCRIPTION:

The WREAFS Program is a series of assessment and demonstration projects for pollution prevention and waste reduction conducted cooperatively by EPA and other Federal agencies. The objectives of the WREAFS Program include: 1) performing waste minimization opportunity assessments (WMOA's); 2) demonstrating pollution prevention techniques or technologies at Federal facilities; 3) conducting pollution prevention workshops within the Federal sector; and 4) enhancing pollution prevention benefits within the Federal community.

There are completed, on-going and/or future assessments and demonstrations with Departments of Agriculture, Defense, Energy, Interior, Transportation, Treasury, and Veteran Affairs. The DOD and DOE work is focused on a wide range of industrial and military operations including: metal cleaning, solvent degreasing, spray painting, vehicle and battery repair, ship bilge cleaning, and equipment overhaul. The other Federal activities more often concentrate on commercial services specific to their activities such as source reduction and recycling opportunities of hospital wastes at a Veteran's Hospital. Resultant pollution prevention recommendations are applicable to both private and public sectors.

TIME PERIOD: June 1, 1988 - Sept. 30, 1992

PUBLICATIONS, PAPERS TO DATE:

1. Paper, "Summary of Cooperative Hazardous Waste Minimization With DOD"
2. Paper, "WMOA at Selected DOD Facilities" - Presented at EPA 16th Annual Hazardous Waste Research Symposium, Cincinnati, Ohio, April 3-5, 1990.
3. Three Paper session presented at the International Conference on Pollution Prevention: Clean Technologies and Clean Products (ICPP), Washington, D.C., June 1990.
4. Paper, "Pollution Prevention Research Within the Federal Community", EPA 17th Annual Hazardous Waste Research Symposium, Cincinnati, Ohio, April 7-11, 1991.
5. WMOA Report and Project Summary - Philadelphia Naval Shipyard: EPA/600/S2-90/046, NTIS Accession No. PB91-125690
6. WMOA Report and Project Summary - Ft. Riley, Kansas: EPA/600/S2-90/031, NTIS Accession No. PB90-250176
7. WMOA Report and Project Summary - Keyport, Washington: in press.
8. Coast Guard WMOA Report and Project Summary - Governor's Island: EPA/600/2-90/062, NTIS Accession No. PB91-136556.
9. Cincinnati Veteran's Medical Center Case Study Report: in press.

FUTURE OUTPUTS:

WMOA Report/Project Summary - Ft. Carson, Colorado	11/01/91
WMOA Report/Project Summary - DOI, Bureau of Mines	11/01/91
WMOA Report/Project Summary - DOA, ARS - Beltsville, MD.	12/01/91
WMOA Report/Project Summary - DOE Facility	12/01/91
WMOA Report/Project Summary - Military Facility Model for 3 sites	12/31/91

PROJECT TITLE: WASTE MANAGEMENT ASSESSMENT AT BASE KETCHIKAN (WREAFS)

EPA PROJECT OFFICERS: David Dellarco (Region X) (206) 442-6501

James S. Bridges (513) 569-7683

PRINCIPAL INVESTIGATOR: Barbara Morson (206) 754-7077
SAIC, Inc.
18706 North Creek Pkwy., Suite 116
Bothell, Washington 98011

PROJECT DESCRIPTION:

During a three-day site visit in October, 1990, a waste management assessment was conducted at USCG Base Ketchikan, Alaska. This jointly funded project between EPA Region X and RREL with the assistance of the Alaska Department of Environmental Conservation developed a number of waste minimization and waste management alternatives for the most significant waste streams generated by the current operation of maintaining several hundred aids to navigation (ATON) in Alaska waters, and to support and maintain several Coast Guard cutters and boats. Phase I of this project is the waste management assessment and Phase II is the development of the implementation plan.

It was determined that the hazardous waste stream can be reduced by as much as 85% with some basic changes in waste management and implementing waste minimization options for depainting, painting, cleaning, and recycling oils, coolants and materials. A number of waste minimization options are discussed in the assessment with a summary of attractive options and recommendations. Phase II of this study will develop an implementation plan to support how hazardous waste disposal costs would be reduced and the annual benefit from implementing the recommended options can be realized. Non-technical issues will be addressed as incentives and barriers to the implementation of waste minimization at Base Ketchikan. The final report will document this case study for transfer to others in the Federal community.

TIME PERIOD: September 1990 - September 1991

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

Waste Management Assessment at Base Ketchikan Report	4/91
Implementation Plan and Final Report	9/91

PROJECT TITLE: SCOTT AIR FORCE BASE (WREAFS)

EPA PROJECT OFFICERS: James S. Bridges (513) 569-7683
and
Anne Robertson (513) 569-7658

PRINCIPAL INVESTIGATOR:

Gary Baker (513) 723-2600
SAIC
635 West Seventh Street
Suite 403
Cincinnati, OH 45203

PROJECT DESCRIPTION:

As part of the WREAFS program, a waste minimization assessment of Scott Air Force Base has been conducted. The assessment focuses on the non-destructive wheel inspection process. In addition, assessments of the paint stripping/painting/parts cleaning and printed circuit board manufacture were carried out.

Scott AFB operates and maintains a fleet of C-9 medical aircraft. Part of the routine preventative maintenance schedule includes a non-destructive inspection of the airplane landing wheels to insure that no cracks or other discontinuities have developed. The assessment of this procedure focused on the liquid dye penetrant method used at Scott AFB. The primary wastes produced by this method are penetrant, emulsifier, and developer. Several options have been identified for the dye penetrant method including extending the bath life of the emulsifier and the developer by skimming the top layer of fluid and adding fresh makeup rather than completely emptying and cleaning the baths every 6 months; and using a dry developer system rather than a wet developer system.

Options identified for reducing waste in the painting/paint removal/parts cleaning operation included using plastic media blasting equipment for paint stripping and implementation of a comprehensive water treatment program for the wet spray booths. Possible options for decreasing the waste generated by the printed circuit board manufacturing operation included using an electroless copper plating solution to one that does not contain formaldehyde and recovering the copper from the spent electroless plating solution. Because the circuit board operation is a small one and follows the standard operating procedures developed by the supplier, changes in the current process may not be feasible.

TIME PERIOD: 7/90 - 7/91

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

Project Report and Summary on Waste Minimization Opportunities 7/91

PROJECT TITLE: EVALUATION OF EMULSION CLEANERS AT AIR FORCE PLANT NO. 6 (WREAFS)

EPA PROJECT OFFICER: Johnny Springer (513) 569-7542

PRINCIPAL INVESTIGATOR: Gary E. Baker (513) 723-2611
SAIC
635 West Seventh St., Suite 403
Cincinnati, OH 45203

PROJECT DESCRIPTION:

EPA, under the auspices of the Waste Reduction Evaluations at Federal Sites Program (WREAFS), has worked in cooperation with Lockheed Aeronautical Systems Company-Georgia and Air Force Aeronautical Systems Division to investigate the potential for implementing emulsion cleaners as a replacement for trichloroethylene (TCE). At Air Force Plant No. 6 in Marietta, Georgia, there are 6 vapor degreaser units that utilize TCE to prepare steel and aluminum parts for a variety of subsequent manufacturing steps in the production of military transport aircraft. The eventual goal of the facility is to substitute water-soluble emulsion cleaners to obviate use of 650,000 pounds of TCE.

The objective of this project was to compile a report that evaluated the conformance of the emulsion cleaners to be implemented at Air Force Plant No. 6 with specific qualification test criteria. The information for this report has been developed by documenting past research performed by Air Force Engineering Service Center (AFESC), Boeing and Lockheed. Also, data and information for the report have been accumulated from qualification tests, emulsion cleaner manufacturers/suppliers and an international workshop on solvent substitution.

If the substitution of emulsion cleaners for TCE is implemented at Air Force Plant No. 6, EPA will request follow-up discussions with Lockheed to document the successes, problems and costs associated with the change. The results can then be transferred to similar facilities in DOD or DOE, and can serve to expedite the use of emulsion cleaners at other facilities.

TIME PERIOD: 11/27/90 - 1/25/91

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Project Summary and Final Report 6/91

PROJECT TITLE: CHROMATE RECOVERY BY ADSORPTIVE FILTRATION

EPA PROJECT OFFICER: Lisa M. Brown (513) 569-7634

PRINCIPAL INVESTIGATOR: Mark M. Benjamin (206) 543-7645
University of Washington
Department of Civil Engineering, FX-10
Seattle, Washington 98195

PROJECT DESCRIPTION:

The objective of this project is to evaluate the performance of packed beds of granular media coated with iron oxide and other adsorbents for recovering chromate from industrial waste solutions. The initial testing is being conducted using synthetic wastes. Following that, tests will be conducted using batches of real waste. A small recovery unit will be installed on-site at an industry near the University at the culmination of the project for pilot-scale evaluation.

The experimental tasks have been divided into three phases:

I. Optimization of the process for coating the media with an adsorbent surface;
II. Optimizing collection and recovery of chromate from relatively dilute synthetic waste solutions;
III. Testing the process with real industrial wastes both at bench-scale and on-line at an industrial site.

The University has completed Phase I, and is now working on Phase II. A major concern for this system is the effect of competing ions found in real industrial wastes. In Phase II, regeneration efficiency will be optimized based on results from competing ion tests.

TIME PERIOD: 10/1/89 - 4/30/92

PUBLICATIONS, PAPERS TO DATE:

Brown, L. M., M. M. Benjamin, and T. Bennett, "Chrome Recovery via Adsorptive Filtration," presented at International Conference on Pollution Prevention: Clean Technologies and Clean Products, Washington, D.C., June 1990.

FUTURE OUTPUTS: Final Report 4/30/92

PROJECT TITLE: EVALUATION OF ANTIFREEZE RECYCLING TECHNOLOGIES IN A NEW JERSEY VEHICLE MAINTENANCE AND REPAIR FACILITY

EPA PROJECT OFFICER: Paul M. Randall (513) 569-7673

PRINCIPAL INVESTIGATOR:
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Battelle
505 King Avenue
Columbus, Ohio 43201-2693

William DeStefano (609) 292-8341
NJDEP (Division of Hazardous Waste Management)
401 East State Street
5th Floor West/CN028
Trenton, NJ 08625

PROJECT DESCRIPTION:

The objective of this antifreeze program is to evaluate antifreeze recycling technologies that have potential for reducing wastes in a vehicle maintenance and repair facility. The EPA and the New Jersey Department of Environmental Protection (NJDEP) entered into a two year agreement to study these technologies in cooperation with the N.J. Department of Transportation (NJDOT). Battelle was selected as the contractor.

This antifreeze recycling study is initially evaluating two units, both manufactured by FPPF Chemical Company. The main unit operates on up to 100 gallons of stored spent antifreeze. The smaller portable unit operates on a per-vehicle basis, that is, it is hooked directly to the radiator of the vehicle and does not need prior collection and storage of the spent antifreeze. The evaluation will either verify or deny the capability of the technology to collect, recondition, and allow reuse of the antifreeze. Also, the data will estimate the economics of the use of the technology in the vehicle maintenance and repair industries. Another technology under consideration is a mobile distillation unit that claims to have a superior technological approach compared to filtration.

To date, test plans have been approved for the FPPF antifreeze recycling study. Sampling is tentatively scheduled for March 1991.

TIME PERIOD: 9/1/89 - 8/31/91

PUBLICATIONS, PAPERS TO DATE:

P. M. Randall, "Prototype Evaluation Initiatives in a New Jersey Vehicle Maintenance and Repair Facility," presented at International Conference on Pollution Prevention: Clean Technologies and Clean Products, Washington D. C., June 12, 1990.

FUTURE OUTPUTS: Research Report and Project Summary 1/92

PROJECT TITLE: INDUSTRY-SPECIFIC POLLUTION PREVENTION GUIDES

EPA PROJECT OFFICER: Teresa M. Harten (513) 569-7565

PRINCIPAL INVESTIGATOR(s): Carl Fromm (818) 449-2171
Jacobs Engineering
251 South Lake Avenue
Pasadena, California 91101-3063

Bob Olfenbuttel (614) 424-4827
Battelle
505 King Avenue
Columbus, Ohio 43201-2693

PROJECT DESCRIPTION:

The Pollution Prevention Research Branch is publishing a series of industry-specific pollution prevention guidance manuals. Existing waste reduction reports already developed by the State of California Department of Health Services for targeted industries are modified and augmented so that they are comprehensive, nationally applicable guidance documents. The manuals describe wastes and waste generating processes within the subject industry followed by specific suggestions for reducing these wastes through source reduction and recycling. Also provided are industry-specific worksheets to assist companies and environmental professionals in methodically conducting waste minimization assessments for facilities within the subject industry.

In 1990, seven manuals were published for the industrial categories designated in the titles provided below, making up the first set of manuals in the series. A second set of twelve manuals is scheduled for publication throughout 1991; industrial categories that will be addressed and the publication schedule are listed below.

TIME PERIOD: 11/30/88 - 12/31/91

PUBLICATIONS, PAPERS TO DATE:

1. "Guides to Pollution Prevention: The Paint Manufacturing Industry" EPA/625/7-90/005
2. "Guides to Pollution Prevention: The Pesticide Formulating Industry" EPA/625/7-90/004
3. "Guides to Pollution Prevention: The Commercial Printing Industry" EPA/625/7-90/008
4. "Guides to Pollution Prevention: The Fabricated Metal Industry" EPA/625/7-90/006
5. "Guides to Pollution Prevention: Selected Hospital Waste Streams" EPA/625/7-90/009
6. "Guides to Pollution Prevention: Research and Educational Institutions" EPA/625/7-90/010
7. "Guides to Pollution Prevention: The Printed Circuit Board Manufacturing Industry" EPA/625/7-90/007
8. "Industry Pollution Prevention Guide Manuals", EPA 17th Annual Hazardous Waste Research Symposium, April 9-11, 1991

FUTURE OUTPUTS: Publish Industry-Specific Waste Minimization Manuals:

- Auto Body Refinishing
  Auto Repair
  Photoprocessors — 7/31/91

- Pharmaceutical Preparation
  Marine Maintenance and Repair
  Fiberglass Reinforced and Composite Plastics
  Metal Finishing
  Precious Metal Reclamation — 9/30/91

- Building Construction and Trade
  Non-Agricultural Pesticide Use
  Mechanical Equipment Repair
  Thermal Metal Working — 12/31/91

PROJECT TITLE: SMALL GENERATOR WASTE MINIMIZATION ASSESSMENTS

EPA PROJECT OFFICER: Emma Lou George (513) 569-7578

PRINCIPAL INVESTIGATOR: Dr. F. William Kirsch (215) 387-2255
Industrial Technology & Energy Management Division
University City Science Center
3624 Market Street
Philadelphia, Pennsylvania 19104

PROJECT DESCRIPTION:

Technical assistance to small and medium-sized businesses which lack in-house capability for initiating waste minimization programs is provided through a cooperative agreement with the University City Science Center. Assessment teams composed of faculty and students have been established at the University of Tennessee (Knoxville), Colorado State University (Fort Collins), and the University of Louisville (Kentucky). The assessment teams apply and adapt the procedures in EPA's Waste Minimization Opportunity Assessment Manual to candidate facilities at no cost to the site owner. Waste minimization alternatives are identified and accompanied with estimated implementation costs and projected savings. All aspects of implementation are the responsibility of the host facility. A follow-up visit within one year documents the actual costs and savings generated by any of the recommendations which are implemented.

A broad spectrum of businesses have been included among the sites visited, as reflected in the following partial list:

* Metal Can Production
* Plastic Sign Manufacturing
* Automobile Bumper Refurbishing
* Glass Products
* Logging
* Railroad Car Refurbishing
* Printed Circuit Boards
* Paint Production
* Commercial Printing
* HVAC Equipment Production

TIME PERIOD: June 20, 1988 - September 30, 1991

PUBLICATIONS, PAPERS TO DATE:

1. "Waste Minimization Assessment Centers" by F.W. Kirsch and G.P. Looby; EPA Research Symposium, Cincinnati, Ohio; April 3-5, 1990.

2. "Technical Assistance Centers" by F.W. Kirsch and G.P. Looby; International Conference on Pollution Prevention: Clean Technologies and Clean Products, Washington, D.C., June 10-13, 1990.

3. "Waste Minimization Assessment Centers: Cost Savings Recommended and Implemented in Twelve Manufacturing Plants" by F.W. Kirsch and G.P. Looby; EPA Research Symposium, Cincinnati, Ohio; April 9-11, 1991.

FUTURE OUTPUTS:

12 Environmental Research Briefs	6/91
15 Environmental Research Briefs	10/91
33 Environmental Research Briefs	2/92

PROJECT TITLE: WASTE REDUCTION FROM CHLORINATED SOLVENT DEGREASING OPERATIONS (WREAFS)

EPA PROJECT OFFICER: Mary Ann Curran (513) 569-7837

PRINCIPAL INVESTIGATOR: Dr. Ray Tarrer (205) 826-4827
Auburn University
Auburn, Alabama 36849

PROJECT DESCRIPTION:

In support of the Department of Defense waste minimization program, the Air Force is seeking to obtain the best available technology for its chlorinated solvents program. The major chlorinated degreasing solvent in use is 1,1,1,-trichloroethane (TCA). Concerns about the hazards associated with solvent recycling, as well as the handling of common chlorinated solvent inhibitors, have motivated the Air Force to investigate solvent use and recycling. In this joint effort with EPA, Auburn University is ascertaining what is required to make state-of-the-art solvent recycling technology available and minimize the risks to operators, liability, and damage to parts being cleaned.

Under this charge, Auburn University is conducting research to evaluate the effectiveness of filtration on solvent recovery at Air Force installations in general. Past studies of in-the-field solvent quality indicates that contamination is mostly by foreign matter, and that effective filtration could significantly extend useful life of solvents. Secondly, Auburn University is developing a training film for distribution to various Air Force installations, which illustrate the use of the filtration equipment.

Personnel at Warner Robbins Air Force Base have agreed to permit the filtration study to be conducted at their site.

TIME PERIOD: 10/10/89 - 7/9/91

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

Final Report	12/91
Training Film	12/91

PROJECT TITLE: POLLUTION PREVENTION BY AND FOR SMALL BUSINESS

EPA PROJECT OFFICER(s): Kenneth R. Stone (513) 569-7474
Risk Reduction Engineering Laboratory

Karen V. Brown (202) 557-2027
Office of Small and Disadvantaged Business Utilization

PRINCIPAL INVESTIGATOR: Dr. Edgar Berkey (412) 826-5320
Center for Hazardous Materials Research
320 William Pitt Way
Pittsburgh, Pennsylvania 15238

PROJECT DESCRIPTION:

The goal of this program is to support the implementation and demonstration of promising pollution prevention techniques and technologies by small businesses and to transmit the results of those demonstrations to others in the same, or similar industries. RREL conducted reviews of 176 proposals received under this initiative. From the results of the review process, 17 small businesses have been selected to receive awards of up to $25,000 to demonstrate innovative pollution prevention techniques and technologies. Results of the demonstrations will be evaluated, published and transferred throughout the relevant industries by a variety of methods.

During the next twelve months, demonstrations of pollution prevention technologies will be conducted in the following areas:

* Printed Circuit Boards
* Pesticides
* Printing
* Metal Finishing
* Wood Preserving
* Used Oil
* Coaxial Cable
* Plastics
* Solvent Substitution
* Aerosol Substitution

Also, a second solicitation for proposals is being prepared for the follow-on year. Altogether, this program is expected to produce research briefs on a minimum of thirty-two pollution prevention technologies in diverse industries.

Seventeen trade associations have agreed to participate in this program and provide assistance to small businesses in the areas of technology and information transfer. Presentations of demonstration results will be sponsored at annual conferences and regional workshops as appropriate.

TIME PERIOD: October, 1990 - September, 1992

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

17 Research Briefs from First Year Demonstrations	4/92
15 Research Briefs from Second Year Demonstrations	4/93

PROJECT TITLE: FITZSIMMONS ARMY MEDICAL CENTER (WREAFS)

EPA PROJECT OFFICER: Kenneth R. Stone (513) 569-7474

PRINCIPAL INVESTIGATOR: Marvin Drabkin (703) 750-3000, X278
Versar, Inc.
6850 Versar Center
P.O. Box 1549
Springfield, Virginia 22151

PROJECT DESCRIPTION:

Under the WREAFS program, RREL has taken the initiative to merge the experience and resources of the EPA with other Federal agencies. Last year, a study of the Veteran Affairs Hospital Medical Center in Cincinnati (VA-Cin) was completed under WREAFS and a list of research needs was identified. This list recommends areas for future study by the EPA.

At the Fitzsimmons Army Medical Center (FAMC) in Aurora, Colorado, the Army and the EPA cooperated in an assessment of the Optical Lens Fabrication Laboratory (OFL). The OFL is responsible for producing optical lenses, spectacles, and special optical products for the services. Processes include both glass and plastic lens fabrication. The FAMC is owned and managed by the Army's Health Services Command, and provides a full gamut of medical and health services to all U.S. military personnel, their dependents, and retirees.

An assessment team, made up of Army, EPA, and EPA contractor personnel performed the assessment in August 1990. A draft report will review the observations and offer pollution prevention recommendations for the specific FAMC activities. This report will also evaluate the potential opportunities of future research.

TIME PERIOD: August, 1990 - April, 1991

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Final Report June 1991

PROJECT TITLE: WASTE MINIMIZATION ASSESSMENTS & REVIEWS WITHIN THE FEDERAL COMMUNITY (WREAFS)

EPA PROJECT OFFICER: Kenneth R. Stone (513) 569-7474

PRINCIPAL INVESTIGATOR: Paul Koch (513) 398-2556
Pacific Environmental Services, Inc.
4700 Duke Drive, Suite 150
Mason, Ohio 45040

PROJECT DESCRIPTION:

Under this project, a Waste Minimization Opportunity Assessment (WMOA) has been conducted at a Department of the Treasury facility, the Bureau of Engraving and Printing (BEP), where the principal waste generating activities result in metal and ink wastes.

On December 4/5, 1990, RREL conducted an assessment to identify pollution prevention opportunities at the Bureau of Engraving and Printing. The assessment team examined all processes related to the production of stamps and currency including supplies acquisition, ink formulation, plate fabrication, actual printing of the product, and destruction of rejected product. The principal waste generating activities result in metal and ink wastes indicative of electroplating and printing processes. Of particular concern is the generation of ink sludges from an intaglio printing process that wastes over 80% of the ink used. Applied to the printing of currency, intaglio is used for its security qualities in preventing counterfeiting. From the assessment, a report will be generated, summarizing the BEP activities examined and proposing waste minimization options. These options will be evaluated for their economic viability, and operational feasibility.

In addition, the principal investigator will review reports from two previous WMOAs of Federal facilities: the Veterans Affairs Hospital Medical Center in Cincinnati (VA-Cin); and Building 8100 (FORSCOM), Ft. Riley, Kansas (Ft. Riley). These reviews will evaluate the waste minimization options, findings, recommendations, and R&D needs identified in the earlier studies. The purpose is to take these findings one step further by providing assessment of costs, public opinion, in-house politics, available services, marketing and promotion, and distribution.

TIME PERIOD: August, 1990 - April, 1991

PUBLICATIONS, PAPERS TO DATE:

In-house Marketing Plan for VA-Cin Study	Nov. 1990
Revised Project Summary for VA-Cin	Jan. 1991

FUTURE OUTPUTS:

Project Summary and Report - Veterans Affairs Hospital Medical Center in Cincinnati	May. 1991
Project Summary and Report - Bureau of Engraving and Printing	June. 1991

PROJECT TITLE: WET TO DRY SYSTEM EVALUATION IN A NAVY PAINT SPRAY BOOTH (WREAFS RD&D)

EPA PROJECT OFFICER: Paul M. Randall (513) 569-7673

PRINCIPAL INVESTIGATOR: Jacqueline Ayer (415) 961-5700 Ext. 3902
Acurex Corporation
485 Clyde Avenue
P.O. Box 7044
Mountain View, CA 94039

PROJECT DESCRIPTION:

The U.S. Navy is continually exploring new methods of minimizing the quantity of hazardous waste generated in naval maintenance operations. One industrial operation targeted in this effort is the routine painting of Navy ship and aircraft related equipment.

In typical Navy painting operations, water curtain systems are used to control particulate emissions from enclosed and semi-enclosed paint booths. Although control efficiency of a water curtain system is high, it generates large quantities of hazardous wastewater and sludge. This hazardous residue must be properly disposed of at high cost to the Navy. By converting the water curtain particulate emission control system (PECS) to dry filter operation, a significant source of hazardous waste may be eliminated.

The demonstration project is evaluating the particulate and volatile organic compound (VOC) emissions before and after PECS conversion and the economic benefits derived from the conversion. Acurex completed pre-conversion tests in December 1990. The U.S. Navy plans to convert the spray booth to a dry filter system in January , however the Persian Gulf war has delayed the time schedule. If it's a short war, post-conversion tests may occur this summer (1991).

TIME PERIOD: 11/21/90 - 6/21/91

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Final report and project summary 1/92

PROJECT TITLE: POLLUTION PREVENTION PROGRAM MANUAL

EPA PROJECT OFFICER: Lisa M. Brown (513) 569-7634

PRINCIPAL INVESTIGATOR: To be determined

PROJECT DESCRIPTION:

The objective of this task is to develop a manual that can be used by companies, corporations, and other waste generating institutions for guidance in developing an effective pollution prevention program.

The manual will incorporate be best of a number of existing manuals. It will include information from the Pollution Prevention Act, SARA [Superfund Amendments and Reauthorization Act (1986)], RCRA [Resource Conservation Recovery Act (1976)], and the Clean Air Act. The EPA's Waste Minimization Opportunity Assessment Manual (WMOA) will be used as a base to be built upon. The WMOA is a hazardous waste manual that is over three years old. The new manual will expand beyond hazardous waste, covering all wastes generated at a facility with a multi-media view. Some of the chapters to be included are:

1. Legislative Requirements
2. Program Development
3. Waste Reduction Personnel Training
4. Pollution Prevention Opportunity Assessment
5. Measuring Progress
6. Maintaining the Program
7. The Pollution Prevention Information Clearinghouse (PPIC)
8. Industry Specific PP Checklists for Small Generators
9. Pollution Prevention Options for TRI (Toxic Release Inventory) Chemicals
10. Product Design for Environmentally Friendly Products

An advisory group will be set-up to provide input and review the final product.

TIME PERIOD: 3/01/91 - 8/30/91

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Manual 8/91

PROJECT TITLE: NATO/CCMS PROJECT: IMPROVING ENVIRONMENTAL QUALITY THROUGH POLLUTION PREVENTION AND SUSTAINABLE DEVELOPMENT

EPA PROJECT OFFICER: Harry Freeman (513) 569-7529

PRINCIPAL INVESTIGATOR: Virgina Hathaway (215) 643-5466
JACA
550 Pinetown Road
Ft. Washington, Pennsylvania 19034

PROJECT DESCRIPTION:

The Office of Research and Development is the lead for a three year project to investigate various pollution prevention policies, regulations, and technologies to increase the adoption of pollution prevention strategies in NATO countries. The project supports the establishment of a network of researchers from different participating countries and the holding of periodic workshops, seminars, and conferences. Periodic reports are provided to NATO that address various pollution prevention subjects. The organizational meeting for the project is to be held in Washington in April, 1991.

TIME PERIOD: 2/91 - 5/94

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Outputs for this project are to be determined at the April organizational meeting

PROJECT TITLE: AMERICAN INSTITUTE FOR POLLUTION PREVENTION

EPA PROJECT OFFICER: David G. Stephan (513) 569-7896

PRINCIPAL INVESTIGATOR: Thomas R. Hauser (513) 556-3693
Dept. of Civil and Environmental Engineering
University of Cincinnati
Cincinnati, Ohio 45221

PROJECT DESCRIPTION:

The objective of this project is to establish and support an Institute which can 1) provide a liaison channel between EPA and potential implementors of pollution prevention techniques, primarily in industry, 2) assist the EPA in improving the quality and cost-effectiveness of its programs in the pollution prevention area and 3) help generate both private and public sector support for pollution prevention concepts.

Some 20 individuals with records of accomplishment in pollution prevention and nominated by various industrial trade associations and professional societies have been appointed to Institute membership. Dr. Joseph T. Ling, 3M Company (Ret.), was elected as the Institute's first Chairman. The Institute's Executive Director is Dr. Thomas R. Hauser of the University of Cincinnati. Four Councils representing areas of special concern (Economics, Education, Implementation and Technology) have been established and a set of specific 1- to 2-year objectives have been developed. These include co-sponsoring with AWMA and WPCF a workshop on pollution prevention, assisting EPA on several of its "2% set-aside" projects, developing a set of pollution prevention-oriented design problems for use in various engineering curricula and similar materials for use in various executive education courses, producing a "practical guide" to pollution prevention economics, defining various pollution prevention barriers/incentives as seen by industry, developing a measurement approach for pollution prevention progress and participating in several pollution prevention demonstration projects.

TIME PERIOD: 10/1/88 - indefinite

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

"Regulatory Barriers to Pollution Prevention" (scheduled for April, 1991 issue AWMA Journal)	4/15/91
Handbook of Pollution Prevention-oriented Design/ Homework Problems	11/30/91
Practical Guide to Pollution Prevention Economics	7/31/92

PROJECT TITLE: EPA RESEARCH PROJECT CASE STUDIES

EPA PROJECT OFFICER: Johnny Springer, Jr. (513) 569-7542

PRINCIPAL INVESTIGATOR: In-House Project

PROJECT DESCRIPTION:

A compilation of summaries of waste minimization/pollution prevention demonstrations, assessments and research projects is being prepared as an EPA publication. This publication will contain all pollution prevention activities conducted in the Pollution Prevention Research Branch. The publication will contain an introduction and a subject index. All case studies will be represented according to a common format. A format for the publication has been developed, several reports have been prepared for inclusion in the book and other reports are currently being edited. The book will contain 50 case studies in the first edition.

TIME PERIOD: Annual

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Book entitled "Case Studies in Pollution Prevention - A Collection of Research Briefs from EPA's Pollution Prevention Research Branch" 12/31/91

PROJECT TITLE: SPECIAL EDITION ON WASTE MINIMIZATION FOR JOURNAL OF HAZARDOUS MATERIALS

EPA PROJECT OFFICER: S. Garry Howell (513) 569-7756

PRINCIPAL INVESTIGATOR: In-House Project

PROJECT DESCRIPTION:

A special edition on waste minimization for the Journal of Hazardous Materials is being prepared. After consulting with the editor of the regular edition of the Journal, Gary Bennett of the University of Toledo, it was decided that authors with diverse viewpoints (EPA, academia, and industry) would be solicited for papers. If more than 10 or 12 acceptable papers are received, the excess would be considered for another special edition, or they might be submitted to another special edition, or to another journal. Since the Journal of Hazardous Materials is peer reviewed, most authors would prefer to publish in it.

To date, nine papers have been received and peer reviewed. The author of one paper has asked for more time to include corrections made by one of the reviewers, but promises to have these done by February 15, 1991. The editor, Gary Bennett, is very pleased that we will meet the deadline.

TIME PERIOD: 11/1/89 - 1/2/91

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Journal Publication 7/91 (estimated)

PROJECT TITLE: PRODUCT LIFECYCLE ASSESSMENTS WORKSHOP

EPA PROJECT OFFICER: Mary Ann Curran (513) 569-7837

PRINCIPAL INVESTIGATOR: Dr. James A. Fava (202) 371-1090
Society of Environmental Toxicology and Chemistry
1101 14th Street, N.W.
Suite 1100
Washington, D.C. 20005

PROJECT DESCRIPTION:

The Society of Environmental Toxicology and Chemistry (SETAC) organized and conducted a workshop August 18-23, 1990, to develop a technical framework for product lifecycle assessments (PLA's). This workshop was conducted in a format which follows SETAC's successful Pellston Workshop Series. Since 1977, eight workshops of this type have been held. Participants invited to the workshop included 54 representatives from industry, academia, trade associations and State and Federal governments.

The PLA Workshop reached consensus on the current questions about approaches to performing PLA's and developed recommendations about what additional information is necessary to provide a better understanding of the methodology. The accomplishments of the workshop were to 1) provide definitions, terms, and common vocabulary; 2) discuss state-of-the-art methodologies; 3) organize case histories and other consensus building thinking; and 4) identify research priorities.

The workshop report has been printed as a SETAC publication.

TIME PERIOD: 7/90 - 12/90

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Final Report 2/91

PROJECT TITLE: CLEAN TECHNOLOGY APPLICATION GUIDES

EPA PROJECT OFFICER: Paul M. Randall, PPRB (513) 569-7673
and
Harold D. Williams, CERI (513) 569-7361

PRINCIPAL INVESTIGATOR: To be determined

PROJECT DESCRIPTION:

PPRB and CERI are developing a series of industry-by-industry Clean technology application guides that will illustrate through examples how industries are reducing toxic and other releases to the environment.

The effort is to be developed in a phased approach involving initially the identification of recent clean technology applications which can be implemented on a cost effective basis by companies and then the development, peer review, and packaging of the information collected into application guides and supportive information by industrial sector. Cross industry transfer opportunities of technology applications will also be considered. The "first cut" considerations for industrial sectors are:

* Metal fabrication/ metal plating/finishing
* Electronic manufacturing/ equipment/instrument manufacturing
* Printing & publishing
* Pulp and paper manufacturing
* Furniture manufacturing/ wood preserving
* Rubber and plastic manufacturing

This project is envisioned to produce up to nine industrial application guides; up to four industrial training sector briefing packets; and up to seven workshops or alternative peer review mechanisms.

Currently, we are considering potential contractors and acquiring cost estimates. A decision on the contractor should be reached in February 1991 and a work directive drafted.

TIME PERIOD: To be determined

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

Interim report	6/91
Training packets	12/91
Application guides	9/92
Workshops	TBD

PROJECT TITLE: RECLAIMING FIBER FROM NEWSPRINT (WREAFS RD&D)

EPA PROJECT OFFICER: Teresa M. Harten (513) 569-7565

PRINCIPAL INVESTIGATOR: Dennis Gunderson (608) 231-9200
Forest Products Laboratory
One Gifford Pinchot Drive
Madison, Wisconsin 53705-2398

PROJECT DESCRIPTION:

This project, which is funded under an Interagency Agreement with USDA's Forest Products Laboratory in Madison, Wisconsin, is designed to investigate the potential for reclaiming newsprint by means of dry fiberizing and bonding enhancement processes. It is part of a larger research program at FPL that is exploring dry and/or semi-dry papermaking processes. The American Newsprint Publishing Association (ANPA), FPL, and EPA are co-funding the total program. For the dry fiberizing portion of the program, FPL has looked at three methods for disintegrating newsprint to determine whether the goals of fiberizing can be met: effective separation of fibers with minimal damage to or shortening of these fibers. The three methods were hammermilling, ballmilling, and single disk refining.

During the project's first year, in best efforts, FPL determined that 97% of fiber length could be retained (as compared to a wet slushed pulp) when old news was fiberized at 52% moisture content using a disk refiner. However, handsheets made from the semi-dry fiberized pulp did not perform as well as control handsheets. Wet-formed handsheets made from the semi-dry fiberized pulp delivered 93% of the tear strength and only 69% of the tensile strength of the control handsheets.

In an attempt to improve the strength properties of paper made from dry fiberized pulp, the remaining two years of the project is focusing on ways of stimulating the bonding capabilities of the experimental pulp. Although wet technology exists to accomplish bonding enhancement, as with pulping and forming, the present research is investigating ways of doing this under dry or semi-dry conditions. To date, bonding enhancement investigations show that when dry fiberized pulp is exposed to ozone followed by sodium hydroxide the strength properties of handsheets are improved; however, one drawback, yield loss apparently from delignification, also occurs as a result of the treatment.

TIME PERIOD: 6/15/89 - 9/30/92

PUBLICATIONS, PAPERS TO DATE:

Gunderson, D.L.; Scott, C.T.; Gleisner, R.L., and Harten, T.M., "Reclaiming Fiber From Newsprint by Dry Methods", International Conference on Pollution Prevention: Clean Technologies and Clean Products, Washington, D.C., June 10-13, 1990.

FUTURE OUTPUTS:		
	Paper	6/01/90
	Final Report	1/01/93

PROJECT TITLE: COMPOSITES FROM RECYCLED PLASTICS, WOOD, AND RECYCLED WOOD FIBER (WREAFS RD&D)

EPA PROJECT OFFICER: Teresa Harten (513) 569-7565

PRINCIPAL INVESTIGATOR: John Youngquist (608) 231-9398
Forest Products Laboratory
One Gifford Pinchot Drive
Madison, Wisconsin 53705-2398

PROJECT DESCRIPTION:

A three-year interagency agreement was initiated between the USDA Forest Service's Forest Products Laboratory (FPL) and EPA to investigate and develop wood/plastic composites from recycled plastic and wood fiber. It is hoped that commercially viable thermoformable composite products derived from recycled high density polyethylene (HDPE), polyethylene terephthalate (PET), recycled paper, and demolition debris wood can be developed using conventional thermoforming operations based on extrusion, non-woven web, and injection molding technologies. The products developed would have application in such industries as automotive manufacturing, building construction, and furniture manufacturing.

During the project's first eight months, screening trials have begun to: optimize raw material preparation; develop laboratory methods for making composites from recycled materials; develop a performance data base for assessing the composite products. Interest has also been solicited and received from manufacturers of composites made from virgin materials for performing in-plant pilot scale tests using recycled wood or newsprint fiber combined with virgin plastic.

To date composites have been made in the laboratory using the non-woven web method to combine fiberized demolition construction debris with virgin polypropylene (PP) and using the hot melt extrusion method to combine recycled newsprint with virgin HDPE. In both cases, there is initial indication that properties are similar to or improved as compared to controls made from all virgin materials, such as wood flour/HDPE or wood flour/PP composites.

TIME PERIOD: 5/90 - 5/93

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Final Report; Paper 9/30/93

PROJECT TITLE: OIL LIFE EXTENSION

EPA PROJECT OFFICER: Paul M. Randall (513) 569-7673

PRINCIPAL INVESTIGATOR: Carl Renner (907) 276-2864
Alaska Health Project
1818 West Northern Lights Blvd.
Anchorage, AK 99517

PROJECT DESCRIPTION:

This research cooperative agreement is being conducted by the Alaska Health Project (AHP) and the USEPA as part of the Pollution Prevention Research effort. AHP is a non-profit organization located in Anchorage, Alaska and provides technical support to small-medium sized businesses, rural communities, and the state to reduce wastes.

The principal thrust of this research project is to evaluate and demonstrate the effectiveness of by-pass ultra-filtration units with oil analysis to extend the useful life of lubricating oils in motor vehicles. The effectiveness of by-pass filters can be measured by installing them on engines and performing regular lab tests to measure the condition of the oil over time. Oil loses its ability to lubricate when contaminate by water, dirt, metal, particles ranging from 20 to 40 microns. By-pass filters have the ability to filter contaminant particles down to <1 micron and can also absorb water. When sulfur particles combine with moisture in the crankcase oil, corrosive sulfuric acid is formed. By-pass manufactures claim that the filter media will absorb water and minimize the sulfuric acid buildup in the crankcase oil. In the past three years, the Alaska Health Project has identified vendors and users of by-pass filtration units and oil analytical testing programs. Very little research has been done to date on the engineering impact of this technology and its application, especially in rural areas with limited support services.

In September 1990, funding was awarded to AHP. To date the effort is focused on preparing a work plan for the study. This activity has included contacting engine suppliers, oil testing laboratories, and test locations. The work plan was submitted in January 1991 and is being reviewed.

TIME PERIOD: 9/17/90 - 9/16/93

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: To be determined

PROJECT TITLE: POLLUTION PREVENTION IN PUBLIC AGENCIES

EPA PROJECT OFFICER: Emma Lou George (513) 569-7578

PRINCIPAL INVESTIGATOR: Gordon R. Garner (502) 587-0591
Louisville & Jefferson County Metropolitan Sewer District
400 South Sixth Street
Louisville, Kentucky 40202

PROJECT DESCRIPTION:

The Louisville and Jefferson County Metropolitan Sewer District (MSD) is developing and implementing a comprehensive pollution prevention assessment process for public agencies and institutions located in the Louisville Metropolitan area. Under a cooperative agreement with EPA, the MSD will evaluate the current status of pollution prevention awareness and activities at four diverse State, local and Federal government organizations, including municipal governments, the University of Louisville and MSD itself. A pollution prevention assessment process specifically for public agencies will be developed and then tested at MSD and one or two additional agencies. The process will be modified as necessary and then used at all facilities that participate. The widespread use of a uniform procedure will enhance the transfer of information among facilities having common waste management problems and similar waste reduction opportunities.

TIME PERIOD: October 1, 1990 - September 30, 1992

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: Final Report 9/92

PROJECT TITLE: MODEL COMMUNITY POLLUTION PREVENTION CASE STUDY (WREAFS)

EPA PROJECT OFFICER: Kenneth R. Stone (513) 569-7474
Risk Reduction Engineering Laboratory

James Edward (202) 382-6920 / FTS: 382-6920
Pollution Prevention Office

PRINCIPAL INVESTIGATOR: Kevin JM Palmer (703) 821-4630
Science Applications International Corp.
8400 Westpark Drive
McLean, Virginia 22102

PROJECT DESCRIPTION:

This project is to establish a model environmental risk reduction program at Department of Defense (DOD) military bases to demonstrate how pollution prevention techniques can be combined into a community through all the everyday community institutions, business and services. This model plan will address community organization, facilities and services, energy, transportation and education.

EPA and DOD have selected three bases to participate in this study:

Fort Eustis (Army)
Sewell's Point Naval Base
Langley Air Force Base

The initial goal of this program is to institutionalize pollution prevention and energy conservation in these communities, both in practice and mindset. From these activities, the project seeks to develop an integrated, multi-media pollution prevention plan that includes both short-term and long-term projects that are readily transferable into other communities, both public and private.

Currently, EPA and DOD are defining the workplan approach and organizing the roles of participants. The Office of Research and Development, through the WREAFS program, will provide support in conducting facility assessment and defining research opportunities for waste reduction.

TIME PERIOD: 2/90 - 3/93

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS: To Be Determined (TBD)

PROJECT TITLE: METHODOLOGY FOR MEASURING POLLUTION PREVENTION

EPA PROJECT OFFICER: James S. Bridges (513) 569-7683

PRINCIPAL INVESTIGATOR: K. P. Ananth (614) 424-3199
Battelle Memorial Institute
505 King Avenue
Columbus, Ohio 43201-2693

PROJECT DESCRIPTION:

Quantitative, or at least semi-quantitative measures of progress with respect to pollution prevention in the United States are needed. This effort will assist the Agency's Pollution Prevention Office in the development of such measurement methods through 1) conducting a field evaluation of EPA's proposed pollution prevention addendum to its annual Toxics Reduction Inventory (TRI) Questionnaire, 2) developing a candidate pollution prevention progress measurement methodology for the agricultural sector and 3) developing a candidate pollution prevention progress measurement methodology for such progress occurring as a result of product (as opposed to process) changes.

TIME PERIOD: 9/90 - 9/91

PUBLICATIONS, PAPERS TO DATE: None

FUTURE OUTPUTS:

Develop overall Workplan	9/90
Prepare detailed plan for TRI evaluation	11/90
Initiate TRI field evaluation	12/90
Prepare "white papers" on approaches to agricultural and products measurement methods development	1/91
Prepare draft evaluation of TRI questionnaire	3/91
Submit TRI questionnaire evaluation	5/91
Submit 1st proposed agricultural sector methodology	7/91
Submit 1st proposed products methodology	8/91

January, 1991

POLLUTION PREVENTION RESEARCH BRANCH

PUBLICATIONS

Risk Reduction Engineering Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

Documents with EPA/xxx/xx-xx/xxx #'s can be obtained from:

United States Environmental Protection Agency
Center for Environmental Research Information
26 West Martin Luther King Drive
Cincinnati, Ohio 45268
Telephone: (513) 569-7562

Documents with NTIS Accession Numbers can be obtained from:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
Telephone: (703) 487-4650

Copies of papers: publications/presentations can be obtained from:

United States Environmental Protection Agency
Risk Reduction Engineering Laboratory
Pollution Prevention Research Branch
Mail Stop 466
26 West Martin Luther King Drive
Cincinnati, Ohio 45268

Telephone: (513) 569-7215
Fax: (513) 569-7549

GUIDES / MANUALS

Guides to Pollution Prevention:	The Pesticide Formulating Industry	EPA/625/7-90/004
Guides to Pollution Prevention:	The Paint Manufacturing Industry	EPA/625/7-90/005
Guides to Pollution Prevention:	The Fabricated Metal Products Industry	EPA/625/7-90/006
Guides to Pollution Prevention:	The Printed Circuit Board Manufacturing Industry	EPA/625/7-90/007
Guides to Pollution Prevention:	The Commercial Printing Industry	EPA/625/7-90/008
Guides to Pollution Prevention:	Selected Hospital Waste Streams	EPA/625/7-90/009
Guides to Pollution Prevention:	Research and Educational Institutions	EPA/625/7-90/010

PROJECT SUMMARIES / PROJECT REPORTS

	EPA Document # (Project Summary)	NTIS Accession # (Project Report)
WMOA Report and Project Summary - Philadelphia Naval Shipyard	EPA/600/S2-90/046	PB 91-125 690/AS
WMOA Report and Project Summary - Ft. Riley, Kansas	EPA/600/S2-90/031	PB 90-250 176/AS
WMOA Report and Project Summary - Coast Guard/ Governor's Island	EPA/600/2-90/062	PB 91-136 556/AS
Background Document on Clean Products Research and Implementation	EPA/600/2-90/048	PB 91-108 977
Management of Household and Small-Quantity-Generator Hazardous Waste in the United States	EPA/600/S2-89/064	PB-90 148 867/AS
The EPA Manual for Waste Minimization Opportunity Assessments	EPA/600/S2-88/025	PB 88-213 004/AS

	EPA Document # (Project Summary)	NTIS Accession # (Project Report)
Guidance Document for the WRITE Pilot Program with State and Local Governments	EPA/600/S8-89/070	PB 89-220 487/AS
Machine Coolant Waste Reduction by Optimizing Coolant Life	EPA/600/S2-90/033	PB 90-257 783/AS
Recovery of Metals Using Aluminum Displacement	EPA/600/S2-90/032	PB 89-222 590/AS
Metal Recovery/Removal Using Non-Electrolytic Metal Recovery	EPA/600/S2-90/033	PB 90-250-150/AS

CASE STUDIES

The Environmental Challenge of the 1990's. Proceedings. International Conference on Pollution Prevention: Clean Technologies and Clean Products, June 10-13, 1990	EPA/600/9-90/039	
Waste Minimization in the Printed Circuit Board Industry - Case Study	EPA/600/S2-88/008	PB 88-161 575/AS

PAPERS / PUBLICATIONS

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11.1 WORKSHOP D: POLLUTION PREVENTION AUDITING, THE ARMY'S PERSPECTIVE

11.2 ATTACHMENTS

- Why HAZMIN
- Definition
- HAZMIN Study Phases
- HAZMIN Factors
- Waste Generation
- HAZMIN Incentives
- HAZMIN Data Baseline
- Waste Minimization Techniques
- Magnitude of Effort
- Recommendations Groupings
- Environmental Trap
- Lead
- Summary

11.1 WORKSHOP D: POLLUTION PREVENTION AUDITING, THE ARMY'S PERSPECTIVE

Garry O. Kosteck, P.E., U.S. Army Production Base Modernization Activity Picatinny Arsenal, NJ

Mr. Kosteck's presentation focused on the hazardous waste minimization (HAZMIN) audits performed by the Army at their facilities. Hazardous waste minimization is defined as any method which will reduce or eliminate the total quantity or toxicity of a hazardous waste at the point of generation. Hazard waste minimization efforts have been increased due to several factors, namely legal requirements under RCRA, environmental pressure and disposal cost escalation.

There are three phases to HAZMIN audits as described below:

Phase I

- Identify individual waste generators
- Identify on-site hazardous waste treatment facilities
- Narrative report

Phase II

- Audit of waste streams

Phase III

- Final recommendations - including cost-benefit analysis.

Mr. Kosteck addressed HAZMIN procedures and reviewed the challenges of managing a hazardous waste minimization study. HAZMIN recommendations were discussed including capital projects, research and development projects, housekeeping improvements and management initiatives.

Wastes are typically derived from one or more of the following categories at federal army installations:

Wastewater Treatment	Paint
Solvents	Propellants and explosives
Vehicle maintenance	Metal working
Machinery oils and lubricants	

Waste generation techniques fall into 3 main categories, recycling, source reduction and treatment. Within each category the following techniques are utilized:

A. **Source Reduction**
   1. Source Control
      a. Housekeeping practices
         - waste stream segregation
         - inventory control
         - employee training
         - spill prevention

      b. Input material modification
         - input purification
         - input substitution

      c. Technology modification
         - improved controls
         - process modifications
         - equipment changes
         - energy conservation

   2. Product Substitution

B. **Recycling**
   1. Use/Reuse
      - ingredients in a process
      - effective substitutes

   2. Reclaim
      - processed to recover usable product
      - regeneration

C. **Treatment**
   1. Incineration
   2. Solvent stills
   3. Filter presses and other waste processing equipment

It is very costly to implement many of the technologies required to achieve high rates of waste minimization. Many of the U.S. Army facilities are old and aging which adds to the cost of waste minimization.

AGENDA

* WHY HAZMIN?
* DEFINITION
* INVESTIGATION OVERVIEW
* REDUCTION TECHNIQUES
* ENVIRONMENTAL TRAP
* SUMMARY

WHY HAZMIN?

* LEGAL REQUIREMENTS

- ° RCRA AND 1984 AMENDMENTS
- ° ARMY REQUIREMENTS OF 50% REDUCTION

* ENVIRONMENTAL PRESSURE

* DISPOSAL COST ESCALATION

DEFINITION

Any method which will reduce or eliminate the total quantity or toxicity of a hazardous waste at the <u>point of generation</u>.

HAZMIN STUDY PHASES

Phase I

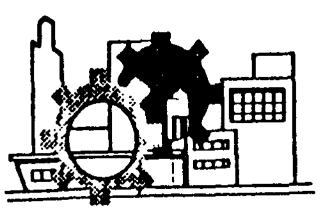
- Identify individual waste generators
- Identify on-site hazardous waste treatment facilities
- Narrative report

Phase II

- Audit of waste streams

Phase III

- Final recommendations-including cost benefit analysis

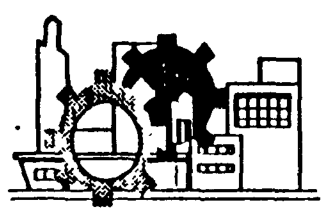


HAZMIN FACTORS

-Visit each waste generation point

-Recommend reduction techniques where warranted:
recycling, substitution, etc.

-Recommend installation-wide HAZMIN actions
e.g.: employee suggestions
proper hazardous waste identification
continued training on new HAZMIN techniques



WASTE GENERATION

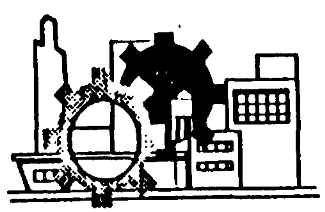
- Treatment process sludges
- Solvents
- Vehicle maintenance
- Machinery oils & lubricants
- Paint
- Propellants & explosives
- Metal working

HAZMIN INCENTIVES

- Lower the long-term environmental liability

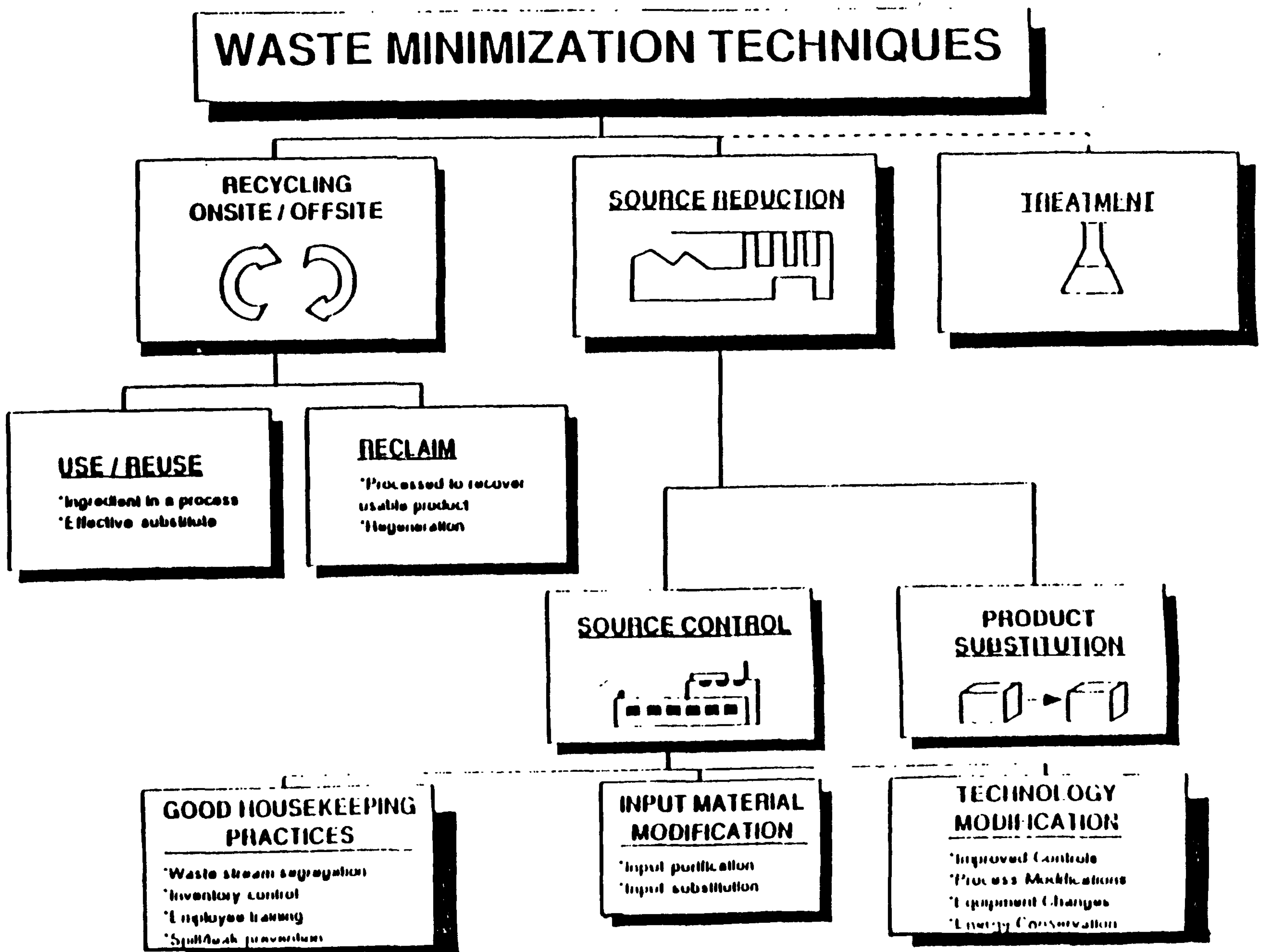
- Reduce costs of
  - on-site treatment
  - compliance (e.g.: permit renewals)
  - disposal and off-site transportation

- Lowers life cycle costs of manufacturing



HAZMIN DATA BASELINE

Num	Building	Owner	Process Descript'n	Waste Type	Amount (gal/yr)	Waste Code
1	123	XYZ	Spray Painting	Paint Residue	200	
2	456	ABC	Vehicle Maint	Motor Oils	1000	
3	789	DEF	Metal Processes	Chromium	100	
4						
5						



Source: Government Institutes

MAGNITUDE OF EFFORT

INDUSTRIAL FACILITY

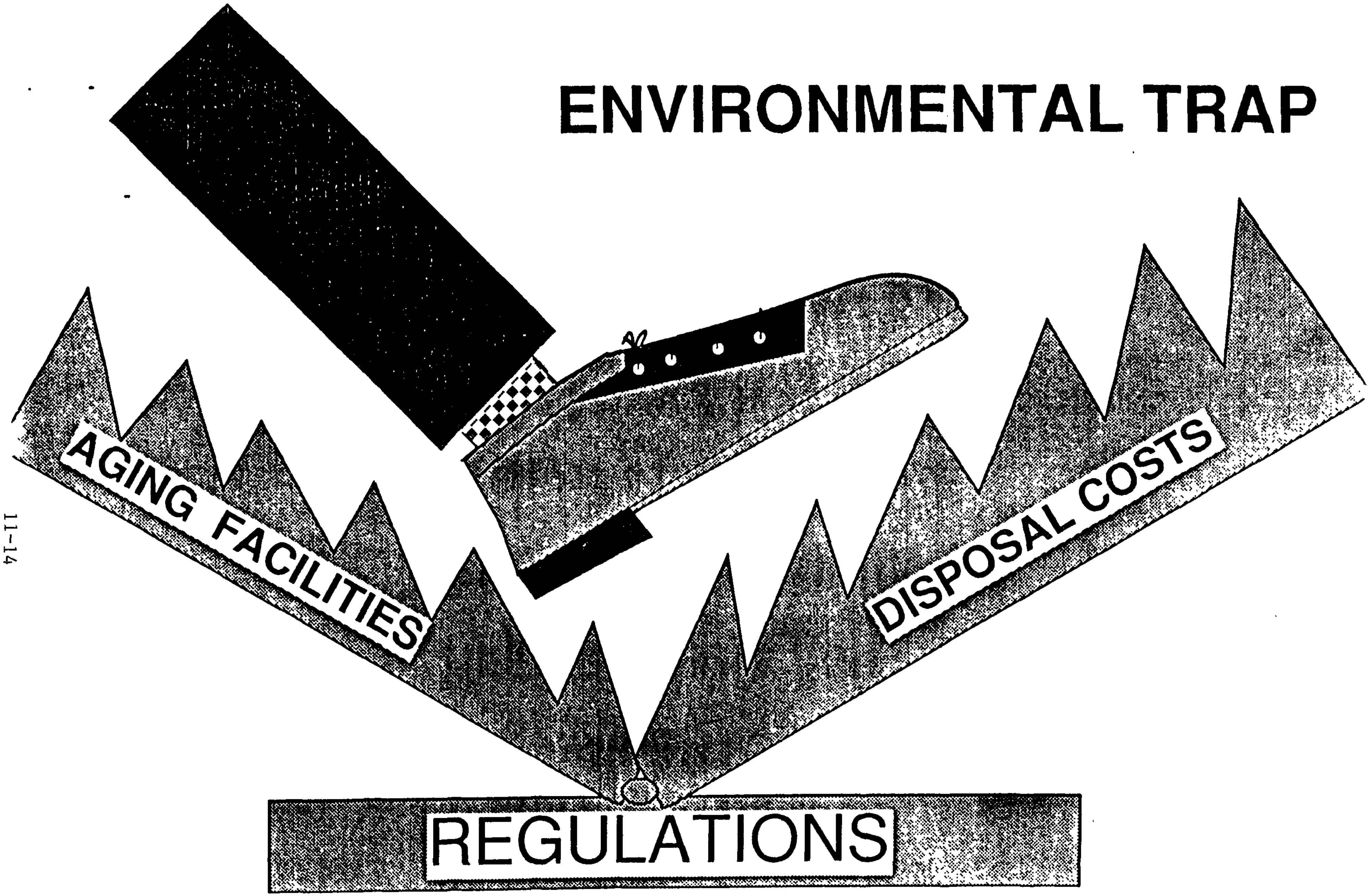
5 +	ON-SITE TREATMENT FACILITIES
25+	WASTE GENERATORS
125 +	WASTE STREAMS

TASK	$$$$$	TIME
PHASE I	50,000	6 MONTHS
PHASE II + III	80,000	6 MONTHS +
AVERAGE =	130,000	12 MONTHS +

RECOMMENDATIONS GROUPINGS

* CAPITAL
* HOUSEKEEPING
* MANAGEMENT INITIATIVES
* RESEARCH + DEVELOPMENT

ENVIRONMENTAL TRAP



LEAD

PAINTS

OPEN BURNING ASH

METAL PARTS RESIDUE

TREATMENT PLANT SLUDGE

+$$ FOR NEW ITEMS DISPOSAL - TCLP

+$$ FOR WASTE TREATMENT - LAND BAN

SUMMARY

* LEGAL AND ARMY REQUIREMENTS

* HAZMIN PROGRAM PHASES

* HAZMIN RECOMMENDATIONS

* COSTS AND TIME

* ENVIRONMENTAL TRAP

12.1 WORKSHOP E: SPILL PREVENTION AND RESPONSE

12.2 ATTACHMENTS

- Newsweek Article - "The Military's Toxic Legacy"
- Spill Prevention, Control, and Countermeasure (SPCC) Information Guide

12.1 WORKSHOP E: SPILL PREVENTION AND RESPONSE

Vincent F. Zenone, On-Scene Coordinator, Hazardous Waste Management Division, EPA-Region III.

Mr. Zenone presented an overview of Spill Prevention Control and Countermeasure (SPCC) regulations. Regulations will become more stringent in accordance with the new Oil Pollution Act. Federal facilities are not exempt from the rules and regulations of the SPCC. In fact, if the regulations are not followed, the facilities are likely to be in the public limelight.

The Oil Pollution Act was previously called the Clean Water Act. The SPCC deals specifically with oil. There are three basic concepts inherent to the SPCC. The regulation that promulgates a facility under operation developing an SPCC plan is 40 CFR 112 (EPA's Oil Pollution Regulation). The basic concepts are prevention, control, and countermeasure. A number of facilities in Region III tend to clump these three concepts in various manners. Prevention is what a facility does to prevent a spill from ever occurring in the first place. Controls are engineering and operational procedures that would control a spill if it occurred. A spill is any unplanned discharged, emission, or leak. A discharge is a spill which threatens or enters into surface waters of the United States or adjoining shore lines. Countermeasures are what you do if the spill occurs on the facility and is contained by the controls or escapes the controls.

Information guidelines has been put together for EPA Region III. In Region III, virtually every type of facility requires a SPCC Plan (40 CFR 112). Criteria for 40 CFR 112 are as follows:

- Above ground in a single tank in excess of 660 gallons.
- Above ground/aggregate storage in excess of 13,020 gallons.
- Underground storage in excess of 42,000 gallons.

These three criteria can be intermixed in any manner. As soon as a facility meets the minimal requirements, all the oil storage areas need to be addressed in the SPCC Plan.

The SPCC Plan must be developed by the owner/operator of the facility. A certified professional engineer must certify the plan indicating that it was drawn up with engineering practices in mind and is in conformance with regulations. The SPCC Plan should be a working document.

40 CFR 114 defines the civil penalties that EPA will access if a facility is in violation of 40 CFR 112. The U.S. Coast Guard mandates that the National Response Center be notified whenever a spill event occurs at a facility.

The SPCC will inspect private industry unannounced. They will inspect federal facilities on an announced basis. SPCC inspections are not time dependent, for example, spills and discharges could happen at any time due to equipment failure.

George W. English, On-Scene Coordinator, Hazardous Waste Management Division, EPA-Region III, Philadelphia, PA.

Mr. English presented slides of several superfund sites and discussed proper spill prevention and response activities. The first site covered a city block and was a storage site of 11,000 drums of surfactants, oxidizers, propane, ether, acids, costics, thousands of lab jars, and other hazardous substances. The site took one year and 3 million dollars to clean up. The site was located in a heavily populated, industrial area near Delaware Avenue and I-95 in central Philadelphia. Therefore, an extensive air monitoring program was put in place. Extensive precautions always need to be taken to prevent contamination (assure zero exposure) of any worker cleaning up the site and precautions need to be taken for possible problems encountered in clean up efforts such as faulty packaging, spontaneous fires, and unknown chemicals.

During clean up efforts an estimation of the likely harm to the community needs to be made. This consists of coordinating and protecting the community and viable resources in the area and of protecting yourself and others.

The second example presented was a hazardous waste site consisting of 5 million burning tires. Each tire had the potential to release up to 7 quarts of oil. Therefore, there was the possibility of groundwater contamination. To resolve this problem, a large pit was dug and a pipe was installed where the oil could be collected via filter fence. Other problems encountered were lack of water, large amounts of soot in equipment, heat, and remaining steel belts.

In the third example, the hazardous problem was oil coming out of a sewer outlet in the Schuylkill River. Coast Guard approval and contractor involvement was necessary. Local emergency planning commissions were also needed to track down the source of the spill.

Mr. English emphasized the need for training seminars and site plans of all federal facilities. Trained personnel need to find parties responsible, and call in experts for each specific project when necessary. First responders need to be aware of the hazards so they can properly assess the site. Damage needs to be assessed and an incident commander needs to be designated. For example, the fire chief is the commander in EPA Region III. For federal facilities, this would be different. Informational input and safety recommendations must be on hand at each federal facility in the event of a hazardous occurrence.

Who gets to clean it up? Each time the EPA goes onto a site, they have the authority to spend a certain amount of dollars to immediately initiate clean up. Clean up contractors need to be in place for each federal facility. Emergency preparedness is the key. If you have a problem and you are not sure how to deal with it, call the EPA for evaluation of contingency plans and training of first responders.

Training consists of OSHA/EPA regulation education.

1. General hazardous awareness (4 hours)
2. Police (8 hours)
3. Operations level (16 hours)
4. Emergency Medical Staff (16 hours)
5. Response in a defensive fashion (16 hour course)
6. First responder technician (24 hour course)
7. Specialist in incident command

The Military's Toxic Legacy

The cold war buildup fouled thousands of acres. Now the Pentagon faces a costly fight to clean up.

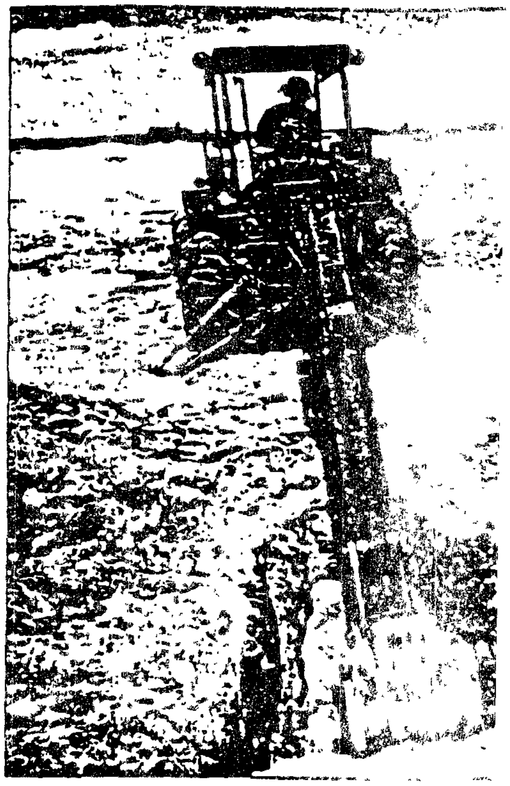
BY BILL TURQUE
AND JOHN MCCORMICK

To the victors in the cold war go the spoils—and the spoilage. It's in the form of fouled soil, contaminated drinking water and acres of wilderness pocked with unexploded bombs. The Pentagon's arsenal, assembled over 40 years to keep the lid on superpower conflict, has left deep scars on the home front. While a generation of new laws and a growing environmental consciousness are bringing private industry to heel, the Department of Defense is America's most pervasive and protected polluter.

Now, as budget cuts draw down the military, the United States must confront a daunting post-cold-war cleanup. The military's 871 domestic installations, strung across 25 million acres of land, produce more tons of hazardous waste each year than the top five U.S. chemical companies combined. Department of Defense reports document 8,000 sites that may require some form of environmental restoration, a task that could take 20 years and $20 billion, or more. The issue will gain momentum early next year when the first of 86 military bases, targeted for cost-cutting closures, begin to shut down. Contaminated ground water, unlined beds of toxic sludge and porous, carelessly constructed landfills make their conversion to civilian use problematic—and expensive. The cost of their restoration could easily eclipse the $5.6 billion in savings the closures were expected to yield over the next two decades. "Next to outright conflict itself," says Rep. Richard Ray, of the House Armed Services Committee, "this is probably the No. 1 priority the Defense Department has to face."

The Pentagon is legally bound to clean the bases before they are sold. But many will be shut for years before they are put right. The size of the task, a plodding bureaucracy and military reluctance to commit its dwindling largesse to mopping up, will add years to the conversion. Some communities fear a double economic hit: the loss of a military base and environmental barriers that could keep the sites from productive reuse. "That is not what people had in mind when they gave up the property for national security," says New Hampshire Rep. Robert Smith.

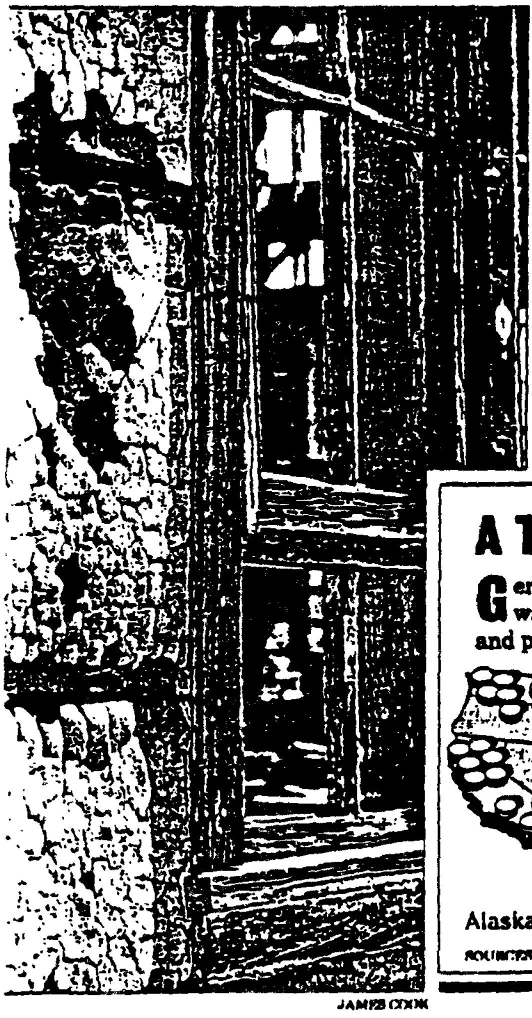
The military's toxic inventory is bounded neither by geography nor size; it includes notorious big messes and nasty little surprises. The Rocky Mountain Arsenal, a 27-square-mile complex in metropolitan Denver, was a laboratory for some of the Army's most deadly alchemy—the production of nerve gas. Once an economic boon and a source of local pride (ARSENAL MEANS



Nasty surprises: *Collecting*

U.S. ARMY CORPS OF ENGINEERS

sort on the Vineyard (top), warning in Denver



JAMES COOK

DEATH FOR FOES, AID TO DENVER, crowed a 1954 headline in the The Denver Post), the plant produced a soup of chemical byproducts left in vast holding ponds. Last year visitors to South Beach at Martha's Vineyard found military teams cautiously sifting through sand dunes to collect 1,500 old ordnance shells. The Massachusetts retreat was once a World War II practice bombing target. Startled islanders who had hauled the stray rounds home as oddities dragged them back for inspection by military munitions experts.

Nowhere in this country is the Pentagon's environmental nightmare more vivid than at the Army's Jefferson Proving Ground (JPG) in southern Indiana. Since 1941 workers have test-fired *23 million* artillery, mortar and tank rounds across 90 square miles of forests and wildflower meadows. An estimated 1.4 million of those test rounds haven't exploded—yet. The result is a wasteland layered with deadly debris. Shells protrude menacingly from the ground; others have burrowed as far as 24 feet below. There are also armor-piercing rounds made of radioactive uranium and munitions containing white phosphorus, which ignites on contact with air. "Poke your nose in the Army's business and you might disappear," says Jane Hance, whose farmhouse windows rattle with the thunder of steady cannonades. "*They* don't even know what they've got over there."

Now Jefferson is on the Pentagon's closure list, but extracting this ordnance will be no day at the beach. Shutting down the range will save the Pentagon about $7 million a year. Cleanup estimates run into the billions. A study commissioned by Indiana officials says it would take $550 million just to minimally sweep the site for a wildlife preserve. Even if money were no object, DOD officials all but admit they could never extract all the ordnance. Townspeople fear a mothballed parcel that would be forever treacherous.

More than safety is at stake. Good jobs like the 410 civilian positions at Jefferson are hard to come by in nearby Madison, a picturesque Ohio River town. Mayor Morris Wooden peppers Congress with mailings that detail the absurd cost-benefit of the closing, stamping the word STUPID in red across the top of each. "Grade-school math tells you the Army won't want to remove this unexploded ordnance," says Wooden. "But we are determined not to let them walk away from the ground they seized 49 years ago."

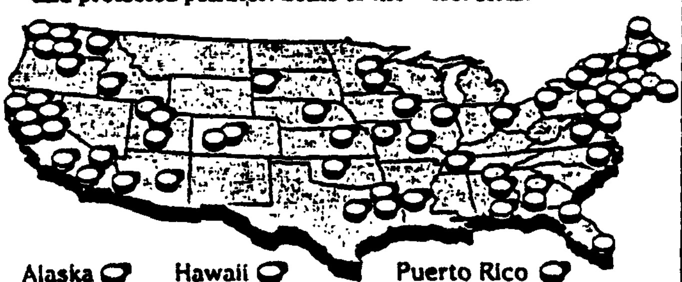
Double standard: A curious double standard protects the Pentagon from vigorous environmental regulation. Ambiguities in federal law have prevented some state and local governments from levying civil fines against military facilities that violate hazardous-waste laws. Moreover, the Environmental Protection Agency does not file civil suits against other federal departments to enforce its regulations; the Justice Department, which would bring any action on EPA's behalf, says the Constitution precludes such suits. It insists that EPA rely on voluntary agreements that can take years to negotiate. The result is that cities and states, which must comply with federal standards at their own sewage-treatment plants, have limited recourse when Uncle Sam pollutes. Two bills pending in Congress would strengthen EPA's hand and allow states to penalize federal polluters.

The Pentagon is hardly alone among federal agencies in slovenly environmental practice. The Department of Energy, the other custodian of the cold-war arsenal, faces a 30-year program to clear radioactive waste from its 17 plants and laboratories. But while DOE's problems may be more notorious, the military's mess is more diffuse. Many of the hot sites are at large bases, but others are wedged in a sprawling infrastructure of obscure arsenals, depots and plants. Ninety-two Pentagon facilities are on, or proposed for addition to, EPA's Superfund list. "These places produce materials designed to kill people," says Mark Schmitt, a soil specialist with the Minnesota Pollution Control Agency. "It's not surprising that their byproducts are often toxic."

The Pentagon says that after a slow start, it is beginning to make peace with the environment. "We *started from* further down the hill, but I look at the progress we've made over the last couple of years," says David Berteau, the Defense Department's top environmental official. But EPA and congressional regulators say DOD's budget doesn't reflect the rhetoric. The White House is proposing $817 million for envi

A Trail of Defense Pollution

Generating hundreds of thousands of tons of hazardous waste yearly, the military is the nation's most pervasive and protected polluter. Some of the worst sites:



BLUMRICH NEWSWEEK

SOURCES: ENVIRONMENTAL PROTECTION AGENCY, DEFENSE DEPARTMENT

12-5

ronmental restoration in 1991, up more than 30 percent from this year but still less than .3 percent of the total Defense budget (Congress is expected to add more). "They talk about the environment. Cheney puts out memos, but the reality is, are they budgeting the money?" asks one House committee staffer.

Years of red tape and bureaucratic jawboning often delay cleanups. For three years U.S. Rep. James Saxton has tried to get the Air Force to treat several acres of his New Jersey district that were contaminated by plutonium in 1960 when a Bomarc missile warhead caught fire. The military is willing, the task relatively inexpensive, but nothing has happened. "I think we've dealt with nine federal agencies to iron out details," he laments. "We get report after report. But nobody *does* anything."

The military's penchant for secrecy and devotion to standardized procedure have slowed the growth of environmental consciousness. Some critics say the old cold-war attitude has improved, but that the Pentagon is still way behind the learning curve. "DOD installations are what the oil and chemical industries were 15 years ago," says Shira Flax, a toxics expert at the Sierra Club.

Too often military intransigence poses the greatest ecological threat. Riverside,

In Tucson, 'We Were Victims of War'

Mission Manor sprang up on Tucson's south side after World War II, growing into a comfortable working-class community where Hispanic and Anglo families could buy their first homes. There were good jobs nearby: U.S. Air Force Plant 44 was thriving. Opened in 1951 and run for the government by Hughes Aircraft, the sprawling factory in the Sonoran Desert turned out nearly 600,000 missiles over the next 40 years, including TOWs, Mavericks and Phoenixes.

Built to destroy distant enemies, the weapons may also have been hazardous to Mission Manor. Residents charge that Hughes dumped decades' worth of dangerous chemicals into the arroyos and ponds surrounding AFP 44, poisoning the neighborhood's drinking water and producing high rates of cancer and other illness. A five-year-old lawsuit—amended last November to add new plaintiffs—is pending. "Even though we didn't go to war, we were victims of war," says Rose Marie Augustine, whose husband has bladder cancer.

Hughes officials refuse to discuss the suit. In court documents and congressional testimony the company denies causing any illness and says past disposal practices followed regulations in force at the time. It adds that other companies in the area also contributed to toxic-pollution problems. EPA reports depict a witches' brew of chemical waste at Hughes. Before it installed a modern treatment system in 1977, it discharged 15,000 gallons of chrome- and cyanide-contaminated water into the desert each week. It also used the solvent trichloroethylene (TCE)—a suspected carcinogen. By 1981, the damage was impossible to ignore. A water sample at the plant revealed TCE at more than 900 times the safe maximum. Later that year the city closed six wells with high TCE levels.

That caught Melinda Bernal's attention. Former high-school classmates in Mission Manor, under 30 and in robust health, were falling desperately ill. City officials insisted that south siders were not at risk from TCE. But in 1985 The Arizona Daily Star confirmed the worst: the neighborhood had consumed TCE-laced water for years. The paper found five types of cancer on the south side—including leukemia and testicular tumors—at rates above national norms for certain age groups. A University of Arizona study of 1,200 children treated for heart disease in Tucson between 1972 and 1986 found elevated rates of congenital defects in those with parents exposed to the TCE-contaminated area.

At least: Official response was timid and indifferent. State officials challenged the evidence, while local politicians, reluctant to alienate a big employer, made themselves invisible. Officials lectured residents on their unhealthy lifestyles. "They called us hysterical Hispanic women," says Sally Rendon, whose son had a five-pound tumor removed from his leg. Neighbors who also worked at AFP 44 feel doubly violated. Marie Sosa, who scrubbed missiles by hand with TCE, says co-workers were frequently overcome by fumes. "You could smell the chemicals," says Sosa, who had breast cancer in 1984.

Procedural wrangling has slowed the cleanup. "The Air Force has pretty much fought us every step of the way," says Dan Opalski, regional EPA project manager. In 1987, Hughes added a system to pump and clean 26 billion gallons of ground water near the plant. The $30 million project, paid for by the Air Force, will take at least a decade. Plans to decontaminate Mission Manor are still in limbo.

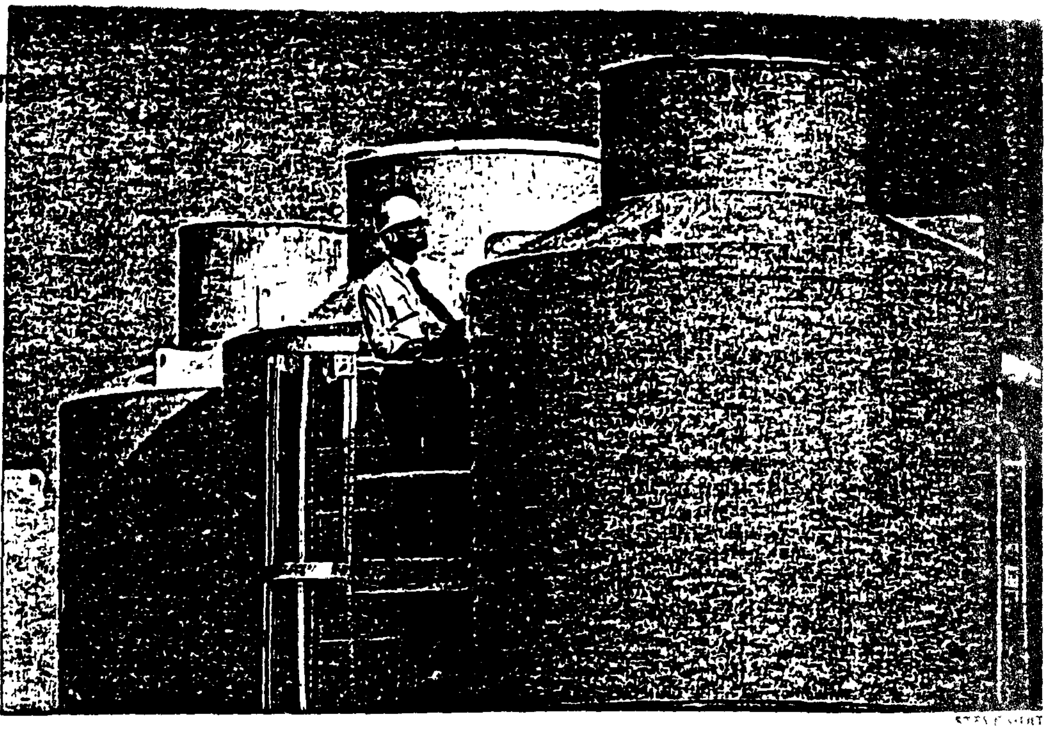
With budgets declining, AFP 44 faces an uncertain future: the Phoenix and Maverick are not in the 1991 Pentagon budget. The Air Force wants to sell, but there's no market for a missile factory with toxic chemicals underfoot. Illness and poverty from heavy medical bills have diminished Mission Manor. The case may go to trial next year, but no one has any illusions about the law. "A lot of people went into this knowing they wouldn't be alive when it was resolved," says Bernal. "But they wouldn't stand by and allow their community to be poisoned."

BILL TURQUE *in Tucson*

'They called us hysterical Hispanics': *Rendon, Augustine and Sosa*
TOM IVES

Calif., officials discovered toxic waste in wells near the perimeter of Norton Air Force Base a decade ago; the installation sits atop the Bunker Hill aquifer, primary source of drinking water for the desert city 50 miles east of Los Angeles. Concerned that an underground plume of trichloroethylene (TCE)—an industrial solvent and suspected carcinogen—might pollute the municipal water supply, the city asked for quick action. The EPA added Norton to its Superfund list in 1987, and city officials believed the problem would be resolved with dispatch.

They were wrong. Instead, EPA and Air Force officials spent two years haggling over how to investigate the extent of the pollution. "It was just appalling," says Riverside attorney Roger Luebs, part of a citizens group monitoring the dispute. "EPA would send them letters saying the test you propose is unsatisfactory. The Air Force would sit on it and then send back another letter. Just back and forth." Meanwhile, another problem cropped up: uranium in the well water. Some suspect a leak in the concrete tomb under the 11th tee of the base golf course, where workers buried radium once used to illuminate aircraft cockpit dials.



'The harder we look, the more we find': *Treating contaminated water in Minnesota*

'Pump and treat': Air Force officials say technical complexities and a sluggish EPA hindered the cleanup. Last summer the Air Force finally agreed to install a $42 million "pump and treat" system by 1991 to intercept the plume and decontaminate the ground water—a process that could continue for more than a decade. Norton will close in 1994, and the Air Force says it is committed to completing the task. But Riverside residents worry about what happens if the contamination proves more serious than first thought. "What they think gets the job done may be a lot less than what's really needed," says Luebs.

Riverside is actually lucky. Because of Norton's Superfund status, it will get first shot at the Pentagon's environmental money. Only a handful of bases earmarked for closure, however, will enjoy such priority. The Pentagon says there are more serious problems at scores of bases that will remain open. Under its "worst first" system, those facilities will get the lion's share of the funding. But Congress, worried that slow cleanups will threaten economic redevelopment in their districts, wants the Pentagon to move faster. California Rep. Vic Fazio is sponsoring a bill that would add $82 million to help bases earmarked for shuttering. The measure is likely to be included in the House version of the 1991 Pentagon budget.

Even bases with Superfund designation will be shut long before they can be cleaned. First on the closure list is Pease Air Force Base near Portsmouth, N.H., north of Boston. State officials hope it can be converted to light industry, a convention center and a coastline wildlife refuge. But it boasts some 20 waste sites, including toxic sludge dumps and a fire-training area that was repeatedly drenched with jet fuel and set ablaze. Pease will close next March; while decontamination at the worst sites on the base is underway, it will be 1994 before the Air Force even has all the problems diagnosed. Some 500 of Pease's 4,254 acres will probably be cordoned off for years—a prospect creating congressional headaches for the EPA. "Redeveloping Pease is the New Hampshire delegation's big project," says one agency official. "We're satisfying them—for now."

The tug of war between environmental and economic concerns may grow more tense, partly because the term cleanup is a misnomer. While the worst sites might eventually be suitable for limited surface uses, they will never be completely safe. Even the military's success stories can leave frightening legacies.

Near homes at the fringe of the Twin Cities Army Ammunition Plant (TCAAP) north of Minneapolis-St. Paul, brightly colored well caps sprout from the ground, marking the water-monitoring stations. For decades plant workers hauled toxics to sites bluntly marked DUMP on Army maps. The liquids sank through 150 feet of sandy soil to the metropolitan area's main system of ground-water aquifers. In 1981 the state confronted the Army with evidence of poisoned municipal wells. The Army reluctantly began a cleanup of the soil and ground water that will [illegible] years, maybe longer.

Neighbors have adjusted. Public meetings that once drew large, angry throngs to discuss the plant's history of pollution now draw only handfuls of environmental gadflies. And state officials say they are satisfied with the Army's progress, although other toxic sites at the plant are still being identified. "The harder we look, the more we find," says Mark Schmitt, who oversees the project for the state. Yet with each small improvement at the facility, a surrounding suburb wants to appropriate a piece of the land for its own use. Some neighbors envision a sports complex of baseball diamonds and soccer fields. But the prospect of kids kicking up dirt leaves Schmitt queasy. "We're not interested in anything that would bring big crowds here," he says.

The dimensions of the military's environmental quagmire keep widening. As its budget shrinks, the Pentagon wants to add 4.5 million acres to bases in Western states, arguing that the broader reach of modern weaponry like the F-4 bomber and the Bradley Fighting Vehicle requires more space for testing and training. Where 4,000 acres was once enough for a World War II-style tank and infantry exercise, Army generals say they now need 80,000. Ranchers and environmentalists—never close allies—have been fighting what they view as a massive land grab at a time when the military should be scaling down. [illegible] see what is happening now as a case of empire building," says Robert Fulkerson of Citizens Alert, a Nevada watchdog group. Expansion, they fear, will do more than increase the military's presence. It will open new frontiers for what has long been a reckless stewardship of the land. ■

12-7

UNITED STATES
ENVIRONMENTAL
PROTECTION AGENCY

July 1990

REGION III
841 CHESTNUT BUILDING
PHILADELPHIA, PA 19107

Western Response and Oil Enforcement Section (3HW32)

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE (SPCC) INFORMATION GUIDE

TABLE OF CONTENTS

FOREWARD

This document provides information to assist with the development of Spill Prevention, Control, and Countermeasure Plans (SPCC Plans) as required under Title 40, Code of Federal Regulations, Part 112 (40 CFR Part 112). The information contained here has been compiled from existing Regulations, EPA documents, and other guidance documents. This document should not be relied upon as the sole source in developing a site-specific SPCC Plan; however, it is intended to be used as a guide in explaining the SPCC Regulations. 40 CFR 112, which is included in Appendix E, is the ultimate standard against which SPCC Plans will be judged. 40 CFR 112 should be used as the primary guide in developing SPCC Plans.

THE SPCC PLAN

BASIC CONCEPTS

There is no rigid format for an SPCC Plan. The guidelines in the Code of Federal Regulations (40 CFR Part 112) state that the SPCC Plan be a carefully thought out plan, prepared in accordance with good engineering practices, and which has full approval of management at a level which has the authority to commit the necessary resources.

The SPCC Plan should clearly address the facility's operating procedures which have been installed to prevent the occurrence of oil spills.

The SPCC Plan should clearly address control measures installed to prevent a spill from entering the navigable waters.

The SPCC Plan should clearly address countermeasures - the plan of action to contain, cleanup and mitigate the effects of an oil spill which impacts navigable waters.

SPILL PREVENTION

Operational errors and equipment failures are the primary cause of spills; therefore, the SPCC Plan should contain measures designed to avoid these errors and failures.

Operational errors can be minimized through adequate supervision of facility process, personnel training and operator awareness of the imperative nature of spill prevention.

Management must be committed to spill prevention and must develop and enforce techniques for safe and efficient operation.

Equipment failures can be minimized through proper initial selection, construction, maintenance of structural integrity and function, and frequent inspections (visual and mechanical). Industry standards and sound engineering practices dictate the proper course of action in each of these areas.

SPILL CONTROL

In EPA Region III, we are generally concerned with spills from facilities where positive containment devices and systems are practical and effective. Dikes, retaining walls, curbing, spill diversion ponds, sumps, etc. fall into the category of positive containment. Only where "impracticability" to provide positive containment can be clearly demonstrated does the facility have the option to take the "contingency" plan approach. Impracticability to provide positive containment alludes mainly to those cases where severe space limitations may preclude installation of structures or equipment to prevent oil from reaching water. Justifying "impracticability" on the basis of financial considerations is unacceptable because the required commitment of manpower, equipment, and materials to expeditiously control, remove, and dispose of spilled oil would not normally offer any significant economic advantage over providing positive containment.

SPILL COUNTERMEASURES

Contingency plans are considered "reactive". They generally describe after-the-fact actions and can only be expected to mitigate the effects of a spill after it occurs. Therefore, spill prevention and spill control must be given first priority consideration in the preparation of the SPCC Plan.

ELEMENTS OF SPCC PLAN

While each SPCC Plan is unique, there are certain elements which may be included almost without exception to make the SPCC Plan comply with the provisions of the Regulation. These elements include, but may not be limited to, the following:

1. Name of facility - This may or may not be the business name.

2. Type of facility - This briefly describes the business activity.

3. Date of Initial Operation - The date that the facility began operation.

4. Location of the facility - This may be a word description, or city address which can be supported by area maps.

5. Name and Address of Owner - This is often an address remote from the facility location.

6. Designated Person Responsible for Oil Spill Prevention Each facility should have some person with overall oil spill responsibility. This person should be thoroughly familiar with the Regulations and the facility's SPCC Plan.

7. Oil Spill History - This section can be either a reactive declaration, or a detailed history of significant spill events which occurred in the twelve-month period prior to the publication of the regulation (December 11, 1972 to December 11, 1973). In the latter case, typical information would include:

    a. Type and amount of oil spilled,
    b. location, date and time of spill(s),
    c. watercourse affected,
    d. description of physical damage,
    e. cost of damage,
    f. cost of cleanup,
    g. cause of spill, and
    h. action taken to prevent recurrence.

8. Management Approval - This is a signed statement of a person with the authority to commit management to implementation of the SPCC Plan.

9. Certification - This is a statement of SPCC Plan certification under the seal, signature, State and registration number of a registered Professional Engineer. The certifying engineer is not necessarily registered in the State in which the facility is located.

NOTE: All of the aforementioned information (elements 1 through 9) may be presented on a single page of an SPCC Plan As an example, a sheet entitled "Certification Information" is included in this information guide as Appendix A.

10. Facility Analysis - A portion of the SPCC Plan should include a description of facility operation which would generally indicate the magnitude of spill potential. For example, the amount and type of storage, normal increments of transfer or patterns of usage, distribution, processes, etc. In this analysis the direction of flow of spilled oil should be indicated along with any factors which are pertinent or influence spill potential. It is appropriate to support this type of information by charts, tables, plot plans, etc. to aid clarity or promote brevity.

11. Location of Facility - The geographical location is an integral part of the SPPC Plan. Location and topographic maps can be critical in determining the adverse consequences of an oil spill. Sources for such maps include: (1) U.S. Geological Survey, (2) State Highway Department, (3) County Highway Engineer, (4) Local Land Surveys, and (5) City Engineer.

12. Facility Inspection - An inspection report covering the facility in terms of equipment, containment, operation, drainage, security, etc. may provide essential information necessary to formulate the SPCC Plan. Such reports could reasonably be incorporated as part of the SPCC Plan. This kind of report would best serve in the more complex facilities and is not considered necessarily an element common to all SPCC Plans.

13. Review of the SPCC Plan - The SPCC Plan must be reviewed by the owner/operator of the facility at least once every three years. This review must be documented.

SPCC EXAMPLES

Several industrial trade associations have developed suggested SPCC Plan preparation guidelines for use by their members. Generally, these guidelines were developed for a particular type of facility and have been very helpful. However, care should be exercised not to rely completely on any stereotyped format. Each SPCC Plan is unique to the facility and requires individual thought processes and tailoring to spill potential specific to the facility.

The American Petroleum Institute has prepared a bulletin entitled "Suggested Procedure for Development of Spill Prevention Control and Countermeasure Plans" (API Bulletin D 16). This bulletin was designed primarily for oil production facilities and may be used in addition to the Regulations and other guidance documents to develop an SPCC Plan that is specific to the facility.

An example SPCC Plan for a modest-sized oil storage facility is included in this information guide as Appendix "B".

KEY POINTS OF PREVENTION REGULATION

The Environmental Protection Agency Oil Pollution Prevention Regulation, published in the Federal Register addresses non-transportation-related facilities and is further identified as Title 40, Code of Federal Regulations, Part 112. The main requirement of facilities subject to the Regulation is the preparation and implementation of a plan to prevent any discharge of oil into waters of the United States. The plan is referred to as a Spill Prevention, Control, and Countermeasure Plan (SPCC Plan).

The following discussion will summarize key elements of the Regulation.

PURPOSE

The purpose of the SPCC Regulation is to prevent discharges of oil into waters of the United States. The main thrust of the Regulation is "prevention" as opposed to "after-the-fact", or "reactive", measures commonly described in Spill Contingency Plans.

APPLIES TO

Owners or operators of facilities engaged in drilling, producing, gathering, storing, processing, refining, transferring or consuming oil and oil products, providing --

The facility is non-transportation-related (see definition of non-transportation Appendix E, pages 12 and 13),

aboveground storage capacity of a single container is in excess of 660 gallons, or an aggregate storage capacity greater than 1,320 gallons, or providing that total below ground storage capacity is greater than 42,000 gallons,

- and -

facilities, which due to their location, could reasonably expect spilled oil to reach waters of the United States.

MAIN OBJECTIVE OF REGULATION

Requires facilities which are subject to the Regulation to prepare and implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan, prepared in accordance with guidelines outlined in Section 112.7 of the Regulation.

WHO PREPARES THE SPCC PLAN?

Owners -- operating their own facilities, or
Operators -- of leased facilities, or
Persons in Charge -- including departments, agencies, and instrumentalities of State or Federal Government.

GENERAL REQUIREMENTS OF THE SPCC PLAN

1. The SPCC Plan shall be a carefully thought out plan, prepared in accordance with good engineering practices, and which has the full approval of management at a level of authority to commit the necessary resources (Section 112.7).

2. The complete SPCC Plan shall follow the sequence outlined (Section 112.7), and include a discussion of the facility's site-specific conformance with the appropriate guidelines listed.

SPECIFIC REQUIREMENTS

The SPCC Plan must be certified by a registered professional engineer (Section 112.3).

A complete copy of the SPCC Plan shall be maintained at the facility, if the facility is normally attended at least eight hours per day, or at the nearest field office, if the facility is not so attended. The SPCC Plan is only submitted to EPA or State Agencies under circumstances and conditions outlined in Sections 112.3 and 112.4.

The SPCC Plan shall be made available to the EPA Regional Administrator, or to his duly authorized representative, for on-site review during normal working hours.

If a discharge occurs -- in excess of 1,000 gallons in a single event, or two discharges occur in "harmful quantities" within any twelve-month period, the owner/operator must then submit copies of the SPCC Plan to the Regional Administrator and to the State Agency in charge of water pollution control activities. Other information must accompany the SPCC Plan as outlined in Section 112.4.

After review of the SPCC Plan submitted under these circumstances, the Regional Administrator may require an amendment to the SPCC Plan as deemed necessary to prevent any future discharges. Amendments must be certified per Section 112.5.

QUESTIONS FREQUENTLY ASKED

Question - **What facilities are subject to the 40 CFR Part 112 Regulation?**

Answer - All Non-transportation-related facilities which have:

1. Aboveground oil storage capacity in excess of 1,320 gallons or a single container (tank, drum, transformer, etc.) in excess of 660 gallons.

2. Underground oil storage capacity in excess of 42,000 gallons.

3. Facilities which due to their location and capacities in 1 and 2 could reasonably be expected to discharge oil into waters of the United States if a spill should occur.

4. The facility must address both above ground and underground storage capacities when subject to 40 CFR Part 112.

Question - **What is considered a non-transportation-related facility?**

Answer - All fixed facilities including support equipment, but excluding interstate pipelines, railroad tank cars en route, transport trucks en route and terminals associated with the transfer of bulk oil to or from a water transportation vessel (see the definition of non-transportation in the Memorandum of Understanding at the end of the Regulation).

Question - **Who determines if a facility is in need of an SPCC Plan?**

Answer - The owner/operator as required by the Regulation (Section 112.3).

Question - **What determines reasonability?**

Answer - Location of the facility in relation to a stream, ditch, storm sewer, distance, volume of material, drainage patterns, soil conditions, etc. ignoring manmade structures that would <u>inhibit</u> the flow of oil.

Question - **What constitutes an SPCC Plan?**

Answer - A detailed, site-specific written description of how a facility's operation complies with the guidelines suggested in the Regulation (Section 112.7). The SPCC Plan must also be certified by a registered Professional Engineer.

A sketch or drawing of the site will assist in identification of the implementation.

uestion - **Who is required to prepare the SPCC Plan?**

Answer - The owner/operator is required to prepare a written SPCC Plan which must be certified by a Professional Engineer (Section 112.3 and 112.7).

Question - **Why does the SPCC Plan have to be certified?**

Answer - To assure that good engineering practices are followed in preparing the SPCC Plan (Sections 112.3 and 112.7).

Question - **What are the requirements for certification?**

Answer - The engineer should be familiar with the provisions of 40 CFR Part 112, must have examined the facility, and be a registered professional engineer in at least one state. It is not necessary to be registered in the state in which the facility is located. The engineer's name, registration number and state of registration shall be included as part of the SPCC Plan (Section 112.3).

Question - **When the SPCC Plan is completed and certified, is it sent to EPA for review?**

Answer - No, a certified copy of the SPCC Plan is required to be available at the facility for EPA on-site review, if the facility is attended at least eight hours a day. If the facility is not attended, then the SPCC Plan shall be kept at the nearest company office.

Question - **Who reviews the SPCC Plan and how often is the SPCC Plan reviewed?**

Answer - The owner/operator is required to review the SPCC Plan at least once every three years. This review must be documented.

Question - **When must an SPCC Plan be amended?**

Answer - The owner/operator must amend the SPCC Plan whenever there is a change in the facility's design, construction, operation or maintenance which affects the facility's potential for discharge into navigable waters of the United States or adjoining shorelines (Section 112.5).

Amendments must be certified by a Professional Engineer in accordance with Section 112.3.

Question - When a production lease consists of several operations, such as wells, oil/water separators, collection systems, tank batteries, etc., does each operation require a separate SPCC Plan?

Answer - No, one SPCC Plan may include all operations within a single geographical area, however, each operation must be addressed in the SPCC Plan.

Question - Is every loss of oil or oil product subject to a penalty?

Answer - A discharge is defined in the Clean Water Act (CWA) as including, but not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping <u>that enters the waters of the U.S. or on the adjoining shorelines in harmful quantities.</u>

(1) If a spill occurs and enters the water, a penalty will be assessed.
(2) If a spill occurs and is prevented from entering the water, a penalty may or may not be assessed.

Question - What is considered to be a harmful quantity?

Answer - A harmful quantity is defined in the Regulation as a discharge which affects the water quality standards, or causes a film or sheen upon or discoloration of the water or adjoining shorelines, or cause an emulsion or sludge to be deposited beneath the surface or the water or upon adjoining shorelines.

Question - What is considered navigable waters?

Answer - The Clean Water Act (CWA) defines navigable waters as the waters of the United States. The Coast Guard interpretation not only includes the traditional navigable waters, but all streams, creeks, lakes, and ponds connected to the tributary system in a river basin.

Question - Is one spillage of oil into a municipal storm sewer a violation?

Answer - If oil reaches "navigable water" a violation has occurred and penalties will result. The facility spilling the oil must also have an SPCC Plan implemented. A properly engineered and implemented SPCC Plan would prevent a spill from occurring and entering navigable waters.

Question - What penalties are assessed?

Answer - Section 112.6 of 40 CFR authorizes the Regional Administrator to assess a civil penalty up to $5,000 per day for each violation. The guidance for determining penalties is addressed in 40 CFR Part 114.

uestion - What should be reported to the National Response Center (NRC) 1-800-424-8802 (toll free)?

Answer - Discharge of oil involving U.S. waters must be reported to the NRC by the person in charge of the vessel, facility or vehicle from which the discharge occurs. It is also desired that threats of discharges or releases be reported. The procedures for such notices are set forth in 33 CFR Part 153, 40 CFR Part 110, 40 CFR Part 112 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

Question - Do tanks have to be tested?

Answer - Yes, the Regulation recommends periodic testing of tanks, tank supports and foundations (Section 112.7).

Question - Does a State Spill Plan meet the requirements of a Federal SPCC Plan?

Answer - Not necessarily; if the State Spill Plan is intended to be used as the Federal SPCC Plan, it must meet or exceed all the requirements under 40 CFR Part 112. The State Spill Plan must express clearly that it addresses both the state and Federal Regulations.

Question - Where can I get additional information?

nswer - For additional information concerning SPCC regulations, contact the SPCC Coordinator by writing or telephone at the following address:

U.S. Environmental Protection Agency
Region III
SPCC Coordinator - Vincent Zenone (3HW32)
841 Chestnut Building
Philadelphia, PA 19107
(215) 597-3038

APPENDIX
A

he following is an example of a certification page for an SPCC Plan.

CERTIFICATION INFORMATION

A. <u>Name of Facility</u> - Tex's Bulk Storage Terminal

B. <u>Type of Facility</u> - Commercial (Storage and distribution)

C. <u>Date of Initial Operation</u> - January 31, 1970

D. <u>Location of Facility</u> - 100 Everspill Road, Oily City, USA

E. <u>Name and Address of Owner</u> - SJ Oil Company
P.O. Box 00002
Crude City, USA 77000

F. <u>Designated Person Responsible for Oil Spill Prevention</u> -

NAME Mr. Steve Bob Doe

G. <u>Oil Spill History</u> - This facility has experienced no significant oil spill event during the twelve months prior to December 11, 1973.

H. Management approval - Full approval is extended by management at a level with authority to commit the necessary resources.

SIGNATURE

NAME Mr. John Paul Jones

TITLE President - SJ Oil Company

I. Certification - I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

NAME:

SIGNATURE

REGISTRATION NO.:

STATE:

(Seal)
DATE:

Appendix A pg. 1 of 1

APPENDIX
B

EXAMPLE

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

TEX'S BULK STORAGE TERMINAL

100 Everspill Road
Post Office Box 311(K)
Oily City, USA 12345
Telephone (123) 222-2222

SJ Oil Company
P.O. Box 00002
Crude City, USA 77000

CONTACT

Steve Bob Doe, Manager

CERTIFICATION: **I hereby certify that I have examined the facility, and being familiar with the provision of 40 CFR Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.**

Engineer: **Christopher Columbus**

Signature:

License Number: 98765 **State: Of The Union** **(seal)**

Date: 6/11/74

Appendix B pg 1 of 7

1. **NAME OF OWNERSHIP**

Name: SJ Oil Company - Tex's Bulk Storage Terminal
100 Everspill Road
Post Office Box 311(K)
Oily City, USA 12345
Telephone: (123) 222-2222

Manager: Steve Bob Doe
505 Oil Road
Oily City, USA 12345
Telephone: (123) 222-3333

Owner: SJ Oil Company
P.O. Box 00002
Crude City, USA 77000

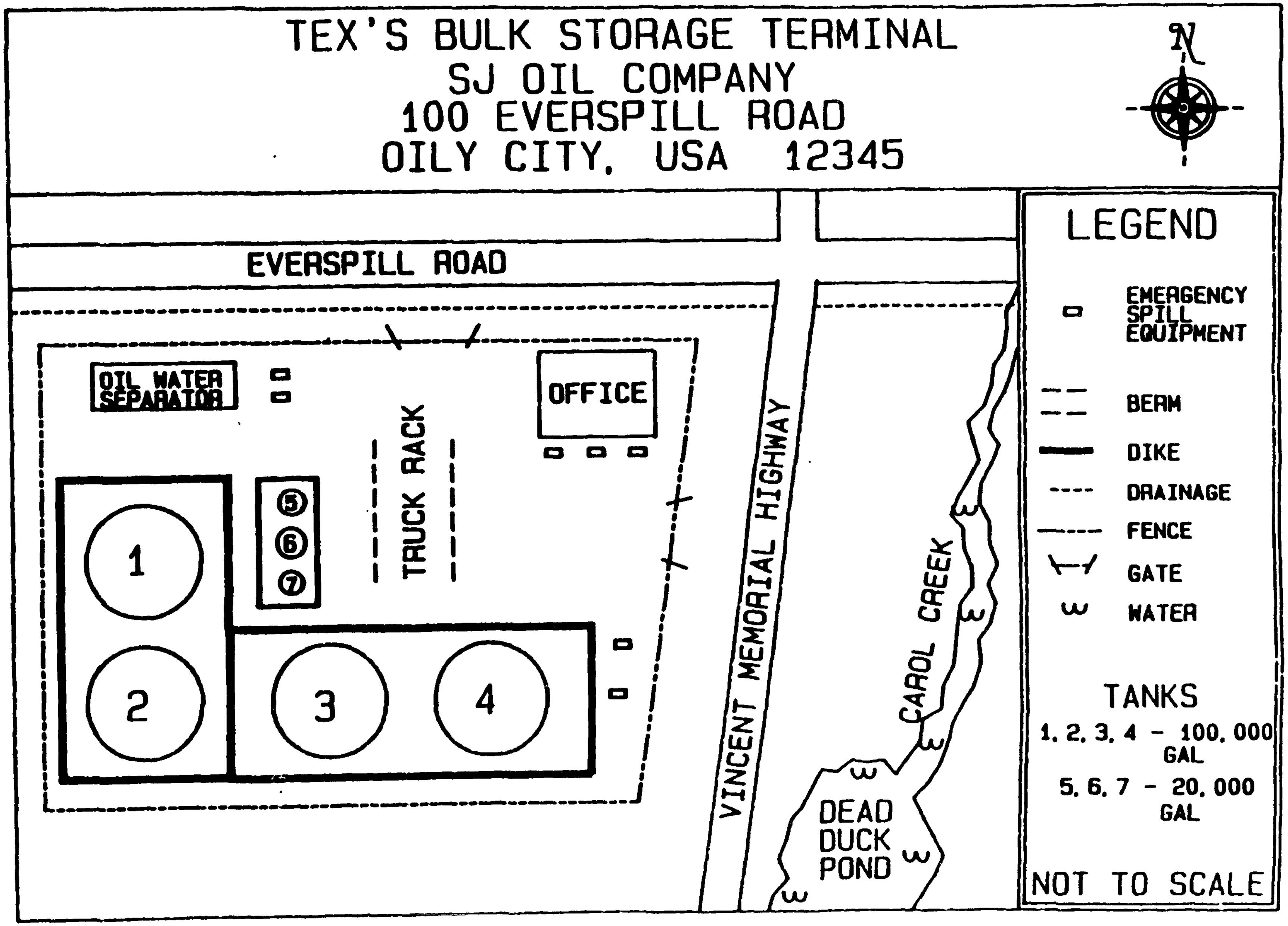
Other Personnel: Secretary-Bookkeeper
Dispatcher
Transport Driver
(3) Deliverymen

Service Area: North-West County

2. **DESCRIPTION OF FACILITY**

Tex's Bulk Storage Terminal of the SJ Oil Company handles, stores and distributes petroleum products in the form of motor gasoline, kerosene, and No. 2 fuel oil. The accompanying drawing shows the property boundaries and adjacent highway drainage ditches, onsite buildings, and oil-handling facilities.

Fixed Storage:	(2)	100,000 gallon vertical tanks (premium gasoline)
	(2)	100,000 gallon vertical tanks (regular gasoline)
	(2)	20,000 gallon vertical tanks (No. 2 fuel oil)
	(1)	20,000 gallon vertical tank (kerosene)
Total:	460,000 gallons	
Vehicles:	(1)	Transport Truck
	(4)	Tankwagon Delivery Trucks


TEX'S BULK STORAGE TERMINAL
SJ OIL COMPANY
100 EVERSPILL ROAD
OILY CITY, USA 12345
N
EVERSPILL ROAD
OIL WATER SEPARATOR
OFFICE
TRUCK RACK
1
2
3
4
5
6
7
VINCENT MEMORIAL HIGHWAY
CAROL CREEK
DEAD DUCK POND
LEGEND
EMERGENCY SPILL EQUIPMENT
BERM
DIKE
DRAINAGE
FENCE
GATE
WATER
TANKS
1, 2, 3, 4 - 100,000 GAL
5, 6, 7 - 20,000 GAL
NOT TO SCALE

3. POTENTIAL SPILL VOLUMES AND RATES

Potential Situation	Volume Released	Rate of Spilling
Complete failure of a full tank	100,000 gallons	Instantaneous
Partial failure of a full tank	1-99,000 gallons	Gradual to instantaneous
Tank overfill	1 to several gallons	Up to 1 gallon per minute
Failure of a pipe	Up to 20,000 gallons	4 gallons per second
Leaking pipe or valve packing	Several ounces to several gallons	Up to 1 gallon per minute
Truck loading area	1 to several gallons	Up to 1 gallon per minute

4. SPILL PREVENTION AND CONTROL

A. STORAGE TANKS

1) Each tank is UL-142 construction (aboveground use).

2) Each tank is equipped with a direct reading gauge. Venting capacity is suitable for the fill and withdrawal rates.

3) A dike surrounds each tank installation. Each dike wall has been constructed and designed to Local, State, and Federal engineering Regulations. The contained volume (height vs. area) is computed based on the single largest tank within (100,000 gallons) and allowance is made for all additional vertical tank displacement volumes below the dike height (estimated spill liquid level), and for precipitation. A 2-inch water drain is located at the lowest point within the dike enclosure, and it connects to a normally closed gate-valve outside the dike. The gate valve is manually operated. Rainwater contained within this dike is examined prior to release to ensure that harmful quantities of oil are not discharged.

4) After a fill pipe is used, a bucket is placed under it to catch any product that might drip from the pipe.

5) There are no buried or partially buried tanks at this facility.

6) Tanks are subject to periodic integrity testing and inspection. Tank supports, foundations, and piping are included in these inspections, and proper records are kept. The exterior of the tanks are examined frequently.

7) Materials stored on the site for spill countermeasures include bagged absorbent, sorbant pads and booms. There is a sand-filled catchment basin for minor, routine spillage at loading pump intakes and at loading rack. This catchment will contain greater than the largest compartment of the largest tank truck loaded or unloaded at this facility. Sand will be replaced as needed, and any oil-contaminated sand is disposed of properly.

8) Failsafe Engineering

   a) Tanks are equipped with high-level alarms.

   b) Tanks are equipped with visual gauges.

B. FACILITY TRANSFER OPERATIONS

1) Buried pipes are properly protected against corrosion. If a section of buried pipe is exposed, it is examined for deterioration.

2) Pipelines not in service or on standby for an extended period are capped or blank-flagged, and marked as to their origin.

3) All pipe supports are properly designed to minimize abrasion and corrosion, and to allow for expansion and contraction.

4) Aboveground pipelines and valves are examined periodically to assess, their condition.

5) Warning signs are posted as needed to prevent vehicles from damaging pipelines.

6) Curbings are installed at the vehicle loading racks.

5. SPILL COUNTERMEASURES

The front highway drainage ditch on the property's northern boundary crosses the highway through a culvert headed eastward and eventually leads to Carol Creek located approximately one half mile distant. Emergency containment action will constitute the erection of an earthen dam and placement of absorbent materials at the entrance to the culvert. Sorbent boom will be strategically placed on Carol Creek upstream from dead duck pond to contain oil which will be recovered and disposed of properly. Manpower materials and equipment are committed to ensure this contingency plan is implemented in a manner that no oil reaches dead duck pond (an environmentally sensitive ecosystem).

6. **PAST SPILL EXPERIENCE**

None

7. **SECURITY**

a) The bulk plant is surrounded by steel security fencing, and the gate is locked when the plant is unattended.

b) All valves which will permit direct outward flow of a tank's contents and dike drain valves are locked in the closed position and the electrical controls for the pumps are locked in the off position when not in use.

c) The loading and unloading connections of pipelines are capped when not in service.

d) Two area lights are located in such a position so as to illuminate the office and storage areas.

8. **PERSONNEL**

All personnel have been instructed by facility management and rehearsed in the following spill prevention and countermeasure plans:

a) No tanks or compartments are to be filled without prior checking reserves.

b) No pump operations will continue unless attended constantly.

c) Warning signs are displayed to check for line disconnections before vehicle departures.

d) Training has been held on oil-spill prevention, containment, and retrieval methods, and a "dry-run" drill for an on-site vehicular spill has been conducted.

e) Instructions and phone numbers have been publicized and posted at the office regarding the report of a spill to the National Response Center and the State.

f) Instructions and company regulations which relate to oil spill prevention and countermeasure procedures have been conspicuously posted.

. **EMERGENCY TELEPHONE NUMBERS**

A. NOTIFICATION PROCEDURES

1) Steve Bob Doe, Facility Manager	(123) 222-3333
2) National Response Center	(800) 424-8802
3) The State	(123) 555-2221

B. CLEANUP CONTRACTORS

1) E-Z Clean Environmental	(123) 222-3038
2) O. K. Engineers, Inc.	(123) 222-2207

C. SUPPLIES AND EQUIPMENT

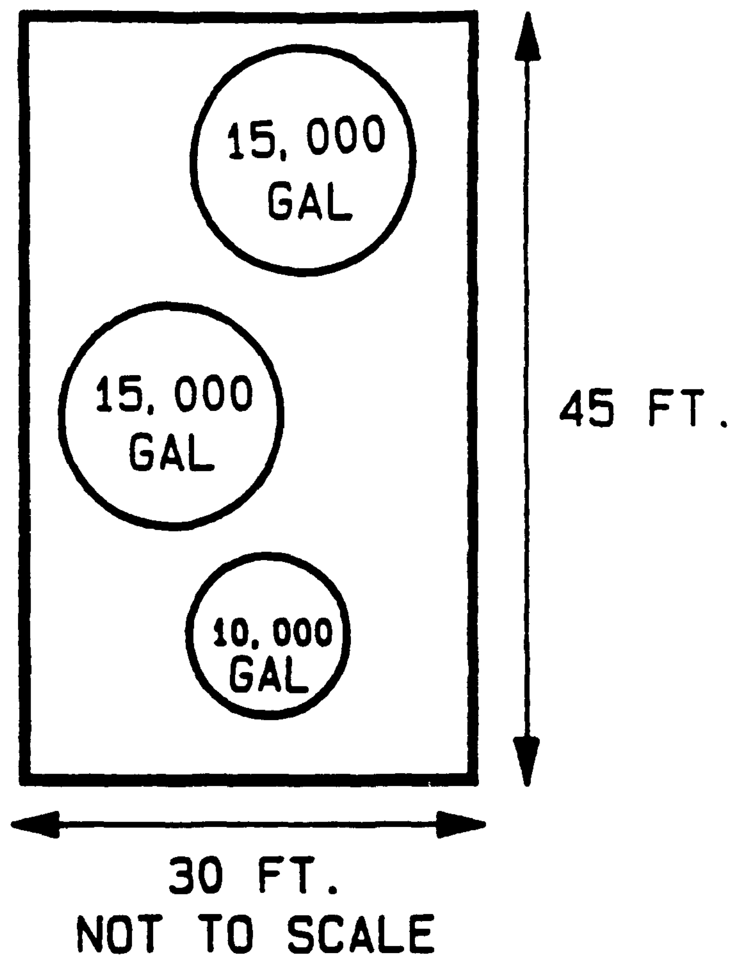
1) Oily City Equipment Co.	(123) 222-8372
2) Northwestern Sorbent Co.	(123) 222-9217

10. **REVIEW DATES**

6/08/77 (signature)
6/01/80 (signature)
6/10/83 (signature)
6/09/86 (signature)

APPENDIX
C

EXAMPLE OF DESIGN: HORIZONTAL TANKS ONLY



Calculations for this example:

a) Minimum containment volume is single largest tank within dike:
15,000 gal X $\frac{.1337\ \text{cu.ft.}}{\text{gal}}$ = 2,006 cu. ft.

b) Available area: 30 ft. X 45 ft. = 1,350 sq. ft.

c) Average Dike height "h"
"h" X 1,350 sq. ft. = 2,006 cu. ft.
"h" = 2,006 cu. ft. - 1,350 sq. ft.
"h" = 1.486 ft. (17.8 inches + freeboard)

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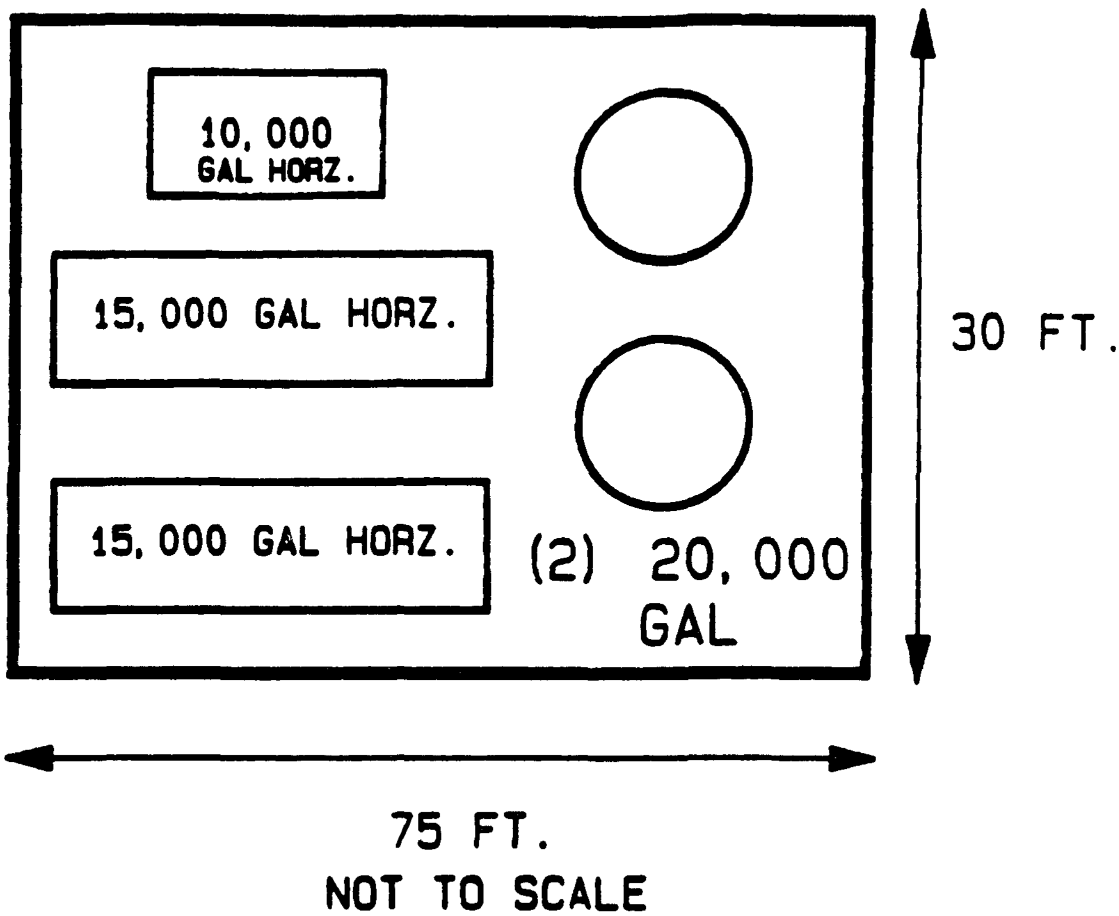
2. EXAMPLE OF DESIGN: HORIZONTAL AND VERTICAL TANKS



Calculations for this example:

a) The minimum containment volume is that of the single largest tank: 20,000 gallons.

   20,000 gallons X .1337 cu. ft./gallon = 2,674 cu. ft.

b) Available dike area, this example: 30' X 75' = 2,250 sq. ft.

c) Observe that some volume of the vertical tanks go below the dike wall height. This volume of the second 20,000 gallon tank (and any additional verticals) assumed <u>not</u> ruptured must be considered.

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APPENDIX

D

PART 110—DISCHARGE OF OIL

AUTHORITY: Secs. 311 (b)(3) and (b)(4) and 501(a), Federal Water Pollution Control Act, as amended (33 U.S.C. 1321 (b)(3) and (b)(4) and 1361(a)); sec. 18(m)(3) of the Deepwater Port Act of 1974 (33 U.S.C. 1517(m)(3)); E.O. 11735, 38 FR 21243, 3 CFR Parts 1971-1975 Comp., p. 793.

SOURCE: 52 FR 10719, Apr. 2, 1987, unless otherwise noted.

§ 110.1 Definitions.

As used in this part, the following terms shall have the meaning indicated below:

"Act" means the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq., also known as the Clean Water Act;

"Administrator" means the Administrator of the Environmental Protection Agency (EPA);

"Applicable water quality standards" means State water quality standards adopted by the State pursuant to section 303 of the Act or promulgated by EPA pursuant to that section;

"Contiguous zone" means the entire zone established or to be established by the United States under article 24 of the Convention on the Territorial Sea and the Contiguous Zone;

"Deepwater port" means an offshore facility as defined in section (3)(10) of the Deepwater Port Act of 1974 (33 U.S.C. 1502(10));

"Discharge," when used in relation to section 311 of the Act, includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping, but excludes (A) discharges in compliance with a permit under section 402 of the Act, (B) discharges resulting from circumstances identified and reviewed and made a part of the public record with respect to a permit issued or modified under section 402 of the Act, and subject to a condition in such permit, and (C) continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 402 of the Act, that are caused by events occurring within the scope of relevant operating or treatment systems;

"MARPOL 73/78" means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, Annex I, which regulates pollution from oil and which entered into force on October 2, 1983;

"Navigable waters" means the waters of the United States, including the territorial seas. The term includes:

(a) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide;

(b) Interstate waters, including interstate wetlands;

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, and wetlands, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) That are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce;

(3) That are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as navigable waters under this section;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this section, including adjacent wetlands; and

(f) Wetlands adjacent to waters identified in paragraphs (a) through (e) of this section: *Provided*, That waste treatment systems (other than cooling ponds meeting the criteria of this paragraph) are not waters of the United States;

"NPDES" means National Pollutant Discharge Elimination System;

"Offshore facility" means any facility of any kind located in, on, or under any of the navigable waters of the United States, and any facility of any kind that is subject to the jurisdiction of the United States and is located in, on, or under any other waters, other than a vessel or a public vessel;

"Oil", when used in relation to section 311 of the Act, means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. "Oil," when used in relation to section 18(m)(3) of the Deepwater Port Act of 1974, has the meaning provided in section 3(14) of the Deepwater Port Act of 1974;

"Onshore facility" means any facility (including, but not limited to, motor vehicles and rolling stock) of any kind located in, on, or under any land within the United States, other than submerged land;

"Person" includes an individual, firm, corporation, association, and a partnership;

"Public vessel" means a vessel owned or bareboat chartered and operated by the United States, or by a State or political subdivision thereof, or by a foreign nation, except when such vessel is engaged in commerce;

"Sheen" means an iridescent appearance on the surface of water;

"Sludge" means an aggregate of oil or oil and other matter of any kind in any form other than dredged spoil having a combined specific gravity equivalent to or greater than water;

"United States" means the States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific Islands;

"Vessel" means every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel; and

"Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include playa lakes, swamps, marshes, bogs and similar areas such as sloughs, prairie potholes, wet meadows, prairie river overflows, mudflats, and natural ponds.

§ 110.2 Applicability

The regulations of this part apply to the discharge of oil prohibited by section 311(b)(3) of the Act. This includes certain discharges into or upon the navigable waters of the United States or adjoining shorelines or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson Fishery Conservation and Management Act). The regulations of this part also define the term "discharge" for purposes of section 18(m)(3) of the Deepwater Port Act of 1974, as provided under § 110.11 of this part.

§ 110.3 Discharge into navigable waters of such quantities as may be harmful.

For purposes of section 311(b) of the Act, discharges of oil into or upon the navigable waters of the United States or adjoining shorelines in such quantities that it has been determined may be harmful to the public health or welfare of the United States, except as provided in § 110.7 of this part, include discharges of oil that:

(a) Violate applicable water quality standards, or

(b) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

§ 110.4 Discharge into contiguous zone of such quantities as may be harmful.

For purposes of section 311(b) of the Act, discharges of oil into or upon the waters of the contiguous zone in such quantities that it has been determined may be harmful to the public health or welfare of the United States, except as provided in § 110.7, include discharges of oil that:

(a) Violate applicable water quality standards, or

(b) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

§ 110.5 Discharge beyond contiguous zone of such quantities as may be harmful.

For purposes of section 311(b) of the Act, discharges of oil into or upon waters seaward of the contiguous zone in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson Fishery Conservation and Management Act) in such quantities that it has been determined may be harmful to the public health or welfare of the United States, except as provided in § 110.7, include discharges of oil that:

(a) Violate applicable water quality standards, or

(b) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

§ 110.6 Discharge prohibited.

As provided in section 311(b)(3) of the Act, no person shall discharge or cause or permit to be discharged into or upon the navigable waters of the United States or adjoining shorelines or into or upon the waters of the contiguous zone or into or upon waters seaward of the contiguous zone in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson Fishery Conservation and Management Act) any oil in such quantities as may be harmful as determined in §§ 110.3, 110.4, and 110.5, except as the same may be permitted in the contiguous zone and seaward under MARPOL 73/78, Annex I, as provided in 33 CFR 151.09.

§ 110.7 Exception for vessel engines.

For purposes of section 311(b) of the Act, discharges of oil from a properly functioning vessel engine are not deemed to be harmful, but discharges of such oil accumulated in a vessel's bilges shall not be so exempt.

§ 110.8 Dispersants.

Addition of dispersants or emulsifiers to oil to be discharged that would circumvent the provisions of this part is prohibited.

§ 110.9 Demonstration projects.

Notwithstanding any other provisions of this part, the Administrator may permit the discharge of oil, under section 311 of the Act, in connection with research, demonstration projects, or studies relating to the prevention, control, or abatement of oil pollution.

§ 110.10 Notice.

Any person in charge of a vessel or of an onshore or offshore facility shall, as soon as he or she has knowledge of any discharge of oil from such vessel or facility in violation of § 110.6, immediately notify the National Response Center (NRC) (800-424-8802; in the Washington, DC metropolitan area, 426-2675). If direct reporting to the NRC is not practicable, reports may be made to the Coast Guard or EPA predesignated On-Scene Coordinator (OSC) for the geographic area where the discharge occurs. All such reports shall be promptly relayed to the NRC. If it is not possible to notify the NRC or the predesignated OCS immediately, reports may be made immediately to the nearest Coast Guard unit, provided that the person in charge of the vessel or onshore or offshore facility notifies the NRC as soon as possible. The reports shall be made in accordance with such procedures as the Secretary of Transportation may prescribe. The procedures for such notice are set forth in U.S. Coast Guard regulations, 33 CFR Part 153, Subpart B and in the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, Subpart E. (Approved by the Office of Management and Budget under the control number 2050-0046)

§ 110.11 Discharge at deepwater ports.

(a) Except as provided in paragraph (b) below, for purposes of section 18(m)(3) of the Deepwater Port Act of 1974, the term "discharge" shall include but not be limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping into the marine environment of quantities of oil that:

(1) Violate applicable water quality standards, or

(2) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

(b) For purposes of section 18(m)(3) of the Deepwater Port Act of 1974, the term "discharge" excludes:

(1) Discharges of oil from a properly functioning vessel engine, (including an engine on a public vessel), but not discharges of such oil accumulated in a vessel's bilges (unless in compliance with MARPOL 73/78, Annex I); and

(2) Discharges of oil permitted under MARPOL 73/78, Annex I.

APPENDIX
E

PART 112—OIL POLLUTION PREVENTION

AUTHORITY: Secs. 311(j)(1)(C), 311(j)(2), 501(a), Federal Water Pollution Control Act (sec. 2, Pub. L. 92-500, 86 Stat. 816 et seq. (33 U.S.C. 1251 et seq.)); sec. 4(b), Pub. L. 92-500, 86 Stat. 897; 5 U.S.C. Reorg. Plan of 1970 No. 2 (1970), 35 FR 15623, 3 CFR 1966-1970 Comp.; E.O. 11735, 38 FR 21243, 3 CFR.

SOURCE: 38 FR 34165, Dec. 11, 1973, unless otherwise noted.

§ 112.1 General applicability.

(a) This part establishes procedures, methods and equipment and other requirements for equipment to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines.

(b) Except as provided in paragraph (d) of this section, this part applies to owners or operators of non-transportation-related onshore and offshore facilities engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing or consuming oil and oil products, and which, due to their location, could reasonably be expected to discharge oil in harmful quantities, as defined in Part 110 of this chapter, into or upon the navigable waters of the United States or adjoining shorelines.

(c) As provided in section 313 (86 Stat. 875) departments, agencies, and instrumentalities of the Federal government are subject to these regulations to the same extent as any person, except for the provisions of § 112.6.

(d) This part does not apply to:

(1) Facilities, equipment or operations which are not subject to the jurisdiction of the Environmental Protection Agency, as follows:

(i) Onshore and offshore facilities, which, due to their location, could not reasonably be expected to discharge oil into or upon the navigable waters of the United States or adjoining shorelines. This determination shall be based solely upon a consideration of the geographical, locational aspects of the facility (such as proximity to navigable waters or adjoining shorelines, land contour, drainage, etc.) and shall exclude consideration of manmade features such as dikes, equipment or other structures which may serve to restrain, hinder, contain, or otherwise prevent a discharge of oil from reaching navigable waters of the United States or adjoining shorelines; and

(ii) Equipment or operations of vessels or transportation-related onshore and offshore facilities which are subject to authority and control of the Department of Transportation, as defined in the Memorandum of Understanding between the Secretary of Transportation and the Administrator of the Environmental Protection Agency, dated November 24, 1971, 36 FR 24000.

(2) Those facilities which, although otherwise subject to the jurisdiction of the Environmental Protection Agency, meet both of the following requirements:

(i) The underground buried storage capacity of the facility is 42,000 gallons or less of oil, and

(ii) The storage capacity, which is not buried, of the facility is 1,320 gallons or less of oil, provided no single container has a capacity in excess of 660 gallons.

(e) This part provides for the preparation and implementation of Spill Prevention Control and Countermeasure Plans prepared in accordance with § 112.7, designed to complement existing laws, regulations, rules, standards, policies and procedures pertaining to safety standards, fire prevention and pollution prevention rules, so as to form a comprehensive balanced Federal/State spill prevention program to minimize the potential for oil discharges. Compliance with this part does not in any way relieve the owner or operator of an onshore or an offshore facility from compliance with other Federal, State or local laws.

[38 FR 34165, Dec. 11, 1973, as amended at 41 FR 12657, Mar. 26, 1976]

§ 112.2 Definitions.

For the purposes of this part:

(a) "Oil" means oil of any kind or in any form, including, but not limited to petroleum, fuel oil, sludge, oil refuse and oil mixed with wastes other than dredged spoil.

(b) "Discharge" includes but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping. For purposes of this part, the term "discharge" shall not include any discharge of oil which is authorized by a permit issued pursuant to section 13 of the River and Harbor Act of 1899 (30 Stat. 1121, 33 U.S.C. 407), or sections 402 or 405 of the FWPCA Amendments of 1972 (86 Stat. 816 et seq., 33 U.S.C. 1251 et seq.).

(c) "Onshore facility" means any facility of any kind located in, on, or under any land within the United States, other than submerged lands, which is not a transportation-related facility.

(d) "Offshore facility" means any facility of any kind located in, on, or under any of the navigable waters of the United States, which is not a transportation-related facility.

(e) "Owner or operator" means any person owning or operating an onshore facility or an offshore facility, and in the case of any abandoned offshore facility, the person who owned or operated such facility immediately prior to such abandonment.

(f) "Person" includes an individual, firm, corporation, association, and a partnership.

(g) "Regional Administrator", means the Regional Administrator of the Environmental Protection Agency, or his designee, in and for the Region in which the facility is located.

(h) "Transportation-related" and "non-transportation-related" as applied to an onshore or offshore facility, are defined in the Memorandum of Understanding between the Secretary of Transportation and the Administrator of the Environmental Protection Agency, dated November 24, 1971, 36 FR 24080.

(i) "Spill event" means a discharge of oil into or upon the navigable waters of the United States or adjoining shorelines in harmful quantities, as defined at 40 CFR Part 110.

(j) "United States" means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Canal Zone, Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific Islands.

(k) The term "navigable waters" of the United States means "navigable waters" as defined in section 502(7) of the FWPCA, and includes:

(1) All navigable waters of the United States, as defined in judicial decisions prior to passage of the 1972 Amendments to the FWPCA (Pub. L. 92-500), and tributaries of such waters;

(2) Interstate waters;

(3) Intrastate lakes, rivers, and streams which are utilized by interstate travelers for recreational or other purposes; and

(4) Intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce.

(l) "Vessel" means every description of watercraft or other artificial contrivance used, or capable of being used as a means of transportation on water, other than a public vessel.

§ 112.3 Requirements for preparation and implementation of Spill Prevention Control and Countermeasure Plans.

(a) Owners or operators of onshore and offshore facilities in operation on or before the effective date of this part that have discharged or, due to their location, could reasonably be expected to discharge oil in harmful quantities, as defined in 40 CFR Part 110, into or upon the navigable waters of the United States or adjoining shorelines, shall prepare a Spill Prevention Control and Countermeasure Plan (hereinafter "SPCC Plan"), in writing and in accordance with § 112.7. Except as provided for in paragraph (f) of this section, such SPCC Plan shall be prepared within six months after the effective date of this part and shall be fully implemented as soon as possible, but not later than one year after the effective date of this part.

(b) Owners or operators of onshore and offshore facilities that become operational after the effective date of this part, and that have discharged or could reasonably be expected to discharge oil in harmful quantities, as defined in 40 CFR Part 110, into or upon the navigable waters of the United States or adjoining shorelines, shall prepare an SPCC Plan in accordance with § 112.7. Except as provided for in paragraph (f) of this section, such SPCC Plan shall be prepared within six months after the date such facility begins operations and shall be fully implemented as soon as possible, but not later than one year after such facility begins operations.

(c) Owners or operators of onshore and offshore mobile or portable facilities, such as onshore drilling or workover rigs, barge mounted offshore drilling or workover rigs, and portable fueling facilities shall prepare and implement an SPCC Plan as required by paragraphs (a), (b) and (d) of this section. The owners or operators of such facility need not prepare a new SPCC Plan each time the facility is moved to a new site. The SPCC Plan may be a general plan, prepared in accordance with § 112.7, using good engineering practice. When the mobile or portable facility is moved, it must be located and installed using the spill prevention practices outlined in the SPCC Plan for the facility. No mobile or portable facility subject to this regulation shall operate unless the SPCC Plan has been implemented. The SPCC Plan shall only apply while the facility is in a fixed (non-transportation) operating mode.

(d) No SPCC Plan shall be effective to satisfy the requirements of this part unless it has been reviewed by a Registered Professional Engineer and certified to by such Professional Engineer. By means of this certification the engineer, having examined the facility and being familiar with the provisions of this part, shall attest that the SPCC Plan has been prepared in accordance with good engineering practices. Such certification shall in no way relieve the owner or operator of an onshore or offshore facility of his duty to prepare and fully implement such Plan in accordance with § 112.7, as required by paragraphs (a), (b) and (c) of this section.

(e) Owners or operators of a facility for which an SPCC Plan is required pursuant to paragraph (a), (b) or (c) of this section shall maintain a complete copy of the Plan at such facility if the facility is normally attended at least 8 hours per day, or at the nearest field office if the facility is not so attended, and shall make such Plan available to the Regional Administrator for on-site review during normal working hours.

(f) Extensions of time.

(1) The Regional Administrator may authorize an extension of time for the preparation and full implementation of an SPCC Plan beyond the time permitted for the preparation and implementation of an SPCC Plan pursuant to paragraph (a), (b) or (c) of this section where he finds that the owner or operator of a facility subject to paragraphs (a), (b) or (c) of this section cannot fully comply with the requirements of this part as a result of either nonavailability of qualified personnel, or delays in construction or equipment delivery beyond the control and without the fault of such owner or operator or their respective agents or employees.

(2) Any owner or operator seeking an extension of time pursuant to paragraph (f)(1) of this section may submit a letter of request to the Regional Administrator. Such letter shall include:

(i) A complete copy of the SPCC Plan, if completed;

(ii) A full explanation of the cause for any such delay and the specific aspects of the SPCC Plan affected by the delay;

(iii) A full discussion of actions being taken or contemplated to minimize or mitigate such delay;

(iv) A proposed time schedule for the implementation of any corrective actions being taken or contemplated, including interim dates for completion of tests or studies, installation and operation of any necessary equipment or other preventive measures.

In addition, such owner or operator may present additional oral or written statements in support of his letter of request.

(3) The submission of a letter of request for extension of time pursuant to paragraph (f)(2) of this section shall in no way relieve the owner or operator from his obligation to comply with the requirements of § 112.3 (a), (b) or (c). Where an extension of time is authorized by the Regional Administrator for particular equipment or other specific aspects of the SPCC Plan, such extension shall in no way affect the owner's or operator's obligation to comply with the requirements of § 112.3 (a), (b) or (c) with respect to other equipment or other specific aspects of the SPCC Plan for which an extension of time has not been expressly authorized.

[38 FR 34165, Dec. 11, 1973, as amended at 41 FR 12657, Mar. 26, 1976]

§ 112.4 Amendment of SPCC Plans by Regional Administrator.

(a) Notwithstanding compliance with § 112.3, whenever a facility subject to § 112.3 (a), (b) or (c) has: Discharged more than 1,000 U.S. gallons of oil into or upon the navigable waters of the United States or adjoining shorelines in a single spill event, or discharged oil in harmful quantities, as defined in 40 CFR Part 110, into or upon the navigable waters of the United States or adjoining shorelines in two spill events, reportable under section 311(b)(5) of the FWPCA, occurring within any twelve month period, the owner or operator of such facility shall submit to the Regional Administrator, within 60 days from the time such facility becomes subject to this section, the following:

(1) Name of the facility;

(2) Name(s) of the owner or operator of the facility;

(3) Location of the facility;

(4) Date and year of initial facility operation;

(5) Maximum storage or handling capacity of the facility and normal daily throughput;

(6) Description of the facility, including maps, flow diagrams, and topographical maps;

(7) A complete copy of the SPCC Plan with any amendments;

(8) The cause(s) of such spill, including a failure analysis of system or subsystem in which the failure occurred;

(9) The corrective actions and/or countermeasures taken, including an adequate description of equipment repairs and/or replacements;

(10) Additional preventive measures taken or contemplated to minimize the possibility of recurrence;

(11) Such other information as the Regional Administrator may reasonably require pertinent to the Plan or spill event.

(b) Section 112.4 shall not apply until the expiration of the time permitted for the preparation and implementation of an SPCC Plan pursuant to § 112.3 (a), (b), (c) and (f).

(c) A complete copy of all information provided to the Regional Administrator pursuant to paragraph (a) of this section shall be sent at the same time to the State agency in charge of water pollution control activities in and for the State in which the facility is located. Upon receipt of such information such State agency may conduct a review and make recommendations to the Regional Administrator as to further procedures, methods, equipment and other requirements for equipment necessary to prevent and to contain discharges of oil from such facility.

(d) After review of the SPCC Plan for a facility subject to paragraph (a) of this section, together with all other information submitted by the owner or operator of such facility, and by the State agency under paragraph (c) of this section, the Regional Administrator may require the owner or operator of such facility to amend the SPCC Plan if he finds that the Plan does not meet the requirements of this part or that the amendment of the Plan is necessary to prevent and to contain discharges of oil from such facility.

(e) When the Regional Administrator proposes to require an amendment to the SPCC Plan, he shall notify the facility operator by certified mail addressed to, or by personal delivery to, the facility owner or operator, that he proposes to require an amendment to the Plan, and shall specify the terms of such amendment. If the facility owner or operator is a corporation, a copy of such notice shall also be mailed to the registered agent, if any, of such corporation in the State where such facility is located. Within 30 days from receipt of such notice, the facility owner or operator may submit written information, views, and arguments on the amendment. After considering all relevant material presented, the Regional Administrator shall notify the facility owner or operator of any amendment required or shall rescind the notice. The amendment required by the Regional Administrator shall become part of the Plan 30 days after such notice, unless the Regional Administrator, for good cause, shall specify another effective date. The owner or operator of the facility shall implement the amendment of the Plan as soon as possible, but not later than six months after the amendment becomes part of the Plan, unless the Regional Administrator specifies another date.

(f) An owner or operator may appeal a decision made by the Regional Administrator requiring an amendment to an SPCC Plan. The appeal shall be made to the Administrator of the United States Environmental Protection Agency and must be made in writing within 30 days of receipt of the notice from the Regional Administrator requiring the amendment. A complete copy of the appeal must be sent to the Regional Administrator at the time the appeal is made. The appeal shall contain a clear and concise statement of the issues and points of fact in the case. It may also contain additional information from the owner or operator, or from any other person. The Administrator or his designee may request additional information from the owner or operator, or from any other person. The Administrator or his designee shall render a decision within 60 days of receiving the appeal and shall notify the owner or operator of his decision.

[38 FR 34165, Dec. 11, 1973, as amended at 41 FR 12658, Mar. 26, 1976]

§ 112.5 Amendment of Spill Prevention Control and Countermeasure Plans by owners or operators.

(a) Owners or operators of facilities subject to § 112.3 (a), (b) or (c) shall amend the SPCC Plan for such facility in accordance with § 112.7 whenever there is a change in facility design, construction, operation or maintenance which materially affects the facility's potential for the discharge of oil into or upon the navigable waters of the United States or adjoining shore lines. Such amendments shall be fully implemented as soon as possible, but not later than six months after such change occurs.

(b) Notwithstanding compliance with paragraph (a) of this section, owners and operators of facilities subject to § 112.3 (a), (b) or (c) shall complete a review and evaluation of the SPCC Plan at least once every three years from the date such facility becomes subject to this part. As a result of this review and evaluation, the owner or operator shall amend the SPCC Plan within six months of the review to include more effective prevention and control technology if: (1) Such technology will significantly reduce the likelihood of a spill event from the facility, and (2) if such technology has been field-proven at the time of the review.

(c) No amendment to an SPCC Plan shall be effective to satisfy the requirements of this section unless it has been certified by a Professional Engineer in accordance with § 112.3(d).

§ 112.6 Civil penalties for violation of oil pollution prevention regulations.

Owners or operators of facilities subject to § 112.3 (a), (b) or (c) who violate the requirements of this Part 112 by failing or refusing to comply with any of the provisions of § 112.3, § 112.4 or § 112.5 shall be liable for a civil penalty of not more than $5,000 for each day such violation continues. Civil penalties shall be imposed in accordance with procedures set out in Part 114 of this Subchapter D.

(Secs. 311(j), 501(a), Pub. L. 92-500, 86 Stat. 868, 885 (33 U.S.C. 1321(j), 1361(a)))

[39 FR 31602, Aug. 29, 1974]

§ 112.7 Guidelines for the preparation and implementation of a Spill Prevention Control and Countermeasure Plan.

The SPCC Plan shall be a carefully thought-out plan, prepared in accordance with good engineering practices, and which has the full approval of management at a level with authority to commit the necessary resources. If the plan calls for additional facilities or procedures, methods, or equipment not yet fully operational, these items should be discussed in separate paragraphs, and the details of installation and operational start-up should be explained separately. The complete SPCC Plan shall follow the sequence outlined below, and include a discussion of the facility's conformance with the appropriate guidelines listed:

(a) A facility which has experienced one or more spill events within twelve months prior to the effective date of this part should include a written description of each such spill, corrective action taken and plans for preventing recurrence.

(b) Where experience indicates a reasonable potential for equipment failure (such as tank overflow, rupture, or leakage), the plan should include a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each major type of failure.

(c) Appropriate containment and/or diversionary structures or equipment to prevent discharged oil from reaching a navigable water course should be provided. One of the following preventive systems or its equivalent should be used as a minimum:

(1) Onshore facilities:

(i) Dikes, berms or retaining walls sufficiently impervious to contain spilled oil;

(ii) Curbing;

(iii) Culverting, gutters or other drainage systems;

(iv) Weirs, booms or other barriers;

(v) Spill diversion ponds;

(vi) Retention ponds;

(vii) Sorbent materials.

(2) Offshore facilities:

(i) Curbing, drip pans;

(ii) Sumps and collection systems.

(d) When it is determined that the installation of structures or equipment listed in § 112.7(c) to prevent discharged oil from reaching the navigable waters is not practicable from any onshore or offshore facility, the owner or operator should clearly demonstrate such impracticability and provide the following:

(1) A strong oil spill contingency plan following the provision of 40 CFR Part 109.

(2) A written commitment of manpower, equipment and materials required to expeditiously control and remove any harmful quantity of oil discharged.

(e) In addition to the minimal prevention standards listed under § 112.7(c), sections of the Plan should include a complete discussion of conformance with the following applicable guidelines, other effective spill prevention and containment procedures (or, if more stringent, with State rules, regulations and guidelines):

(1) *Facility drainage (onshore); (excluding production facilities).* (i) Drainage from diked storage areas should be restrained by valves or other positive means to prevent a spill or other excessive leakage of oil into the drainage system or inplant effluent treatment system, except where plan systems are designed to handle such leakage. Diked areas may be emptied by pumps or ejectors; however, these should be manually activated and the condition of the accumulation should be examined before starting to be sure no oil will be discharged into the water.

(ii) Flapper-type drain valves should not be used to drain diked areas. Valves used for the drainage of diked areas should, as far as practical, be of manual, open-and-closed design. When plant drainage drains directly into water courses and not into wastewater treatment plants, retained storm water should be inspected as provided in paragraphs (e)(2)(iii) (B), (C) and (D) of this section before drainage.

(iii) Plant drainage systems from undiked areas should, if possible, flow into ponds, lagoons or catchment basins, designed to retain oil or return it to the facility. Catchment basins should not be located in areas subject to periodic flooding.

(iv) If plant drainage is not engineered as above, the final discharge of all in-plant ditches should be equipped with a diversion system that could, in the event of an uncontrolled spill, return the oil to the plant.

(v) Where drainage waters are treated in more than one treatment unit, natural hydraulic flow should be used. If pump transfer is needed, two "lift" pumps should be provided, and at least one of the pumps should be permanently installed when such treatment is continuous. In any event, whatever techniques are used facility drainage systems should be adequately engineered to prevent oil from reaching navigable waters in the event of equipment failure or human error at the facility.

(2) *Bulk storage tanks (onshore); (excluding production facilities).* (i) No tank should be used for the storage of oil unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature, etc.

(ii) All bulk storage tank installations should be constructed so that a secondary means of containment is provided for the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation. Diked areas should be sufficiently impervious to contain spilled oil. Dikes, containment curbs, and pits are commonly employed for this purpose, but they may not always be appropriate. An alternative system could consist of a complete drainage trench enclosure arranged so that a spill could terminate and be safely confined in an inplant catchment basin or holding pond.

(iii) Drainage of rainwater from the diked area into a storm drain or an effluent discharge that empties into an open water course, lake, or pond, and bypassing the in-plant treatment system may be acceptable if:

(A) The bypass valve is normally sealed closed.

(B) Inspection of the run-off rain water ensures compliance with applicable water quality standards and will not cause a harmful discharge as defined in 40 CFR Part 110.

(C) The bypass valve is opened, and resealed following drainage under responsible supervision.

(D) Adequate records are kept of such events.

(iv) Buried metallic storage tanks represent a potential for undetected spills. A new buried installation should be protected from corrosion by coatings, cathodic protection or other effective methods compatible with local soil conditions. Such buried tanks should at least be subjected to regular pressure testing.

(v) Partially buried metallic tanks for the storage of oil should be avoided, unless the buried section of the shell is adequately coated, since partial burial in damp earth can cause rapid corrosion of metallic surfaces, especially at the earth/air interface.

(vi) Aboveground tanks should be subject to periodic integrity testing, taking into account tank design (floating roof, etc.) and using such techniques as hydrostatic testing, visual inspection or a system of non-destructive shell thickness testing. Comparison records should be kept where appropriate, and tank supports and foundations should be included in these inspections. In addition, the outside of the tank should frequently be observed by operating personnel for signs of deterioration, leaks which might cause a spill, or accumulation of oil inside diked areas.

(vii) To control leakage through defective internal heating coils, the following factors should be considered and applied, as appropriate.

(A) The steam return or exhaust lines from internal heating coils which discharge into an open water course should be monitored for contamination, or passed through a settling tank, skimmer, or other separation or retention system.

(B) The feasibility of installing an external heating system should also be considered.

(viii) New and old tank installations should, as far as practical, be fail-safe engineered or updated into a fail-safe engineered installation to avoid spills. Consideration should be given to providing one or more of the following devices:

(A) High liquid level alarms with an audible or visual signal at a constantly manned operation or surveillance station; in smaller plants an audible air vent may suffice.

(B) Considering size and complexity of the facility, high liquid level pump cutoff devices set to stop flow at a predetermined tank content level.

(C) Direct audible or code signal communication between the tank gauger and the pumping station.

(D) A fast response system for determining the liquid level of each bulk storage tank such as digital computers, telepulse, or direct vision gauges or their equivalent.

(E) Liquid level sensing devices should be regularly tested to insure proper operation.

(ix) Plant effluents which are discharged into navigable waters should have disposal facilities observed frequently enough to detect possible system upsets that could cause an oil spill event.

(x) Visible oil leaks which result in a loss of oil from tank seams, gaskets, rivets and bolts sufficiently large to cause the accumulation of oil in diked areas should be promptly corrected.

(xi) Mobile or portable oil storage tanks (onshore) should be positioned or located so as to prevent spilled oil from reaching navigable waters. A secondary means of containment, such as dikes or catchment basins, should be furnished for the largest single compartment or tank. These facilities should be located where they will not be subject to periodic flooding or washout.

(3) *Facility transfer operations, pumping, and in-plant process (onshore); (excluding production facilities).* (i) Buried piping installations should have a protective wrapping and coating and should be cathodically protected if soil conditions warrant. If a section of buried line is exposed for any reason, it should be carefully examined for deterioration. If corrosion damage is found, additional examination and corrective action should be taken as indicated by the magnitude of the damage. An alternative would

be the more frequent use of exposed pipe corridors or galleries.

(ii) When a pipeline is not in service, or in standby service for an extended time the terminal connection at the transfer point should be capped or blank-flanged, and marked as to origin.

(iii) Pipe supports should be properly designed to minimize abrasion and corrosion and allow for expansion and contraction.

(iv) All aboveground valves and pipelines should be subjected to regular examinations by operating personnel at which time the general condition of items, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces should be assessed. In addition, periodic pressure testing may be warranted for piping in areas where facility drainage is such that a failure might lead to a spill event.

(v) Vehicular traffic granted entry into the facility should be warned verbally or by appropriate signs to be sure that the vehicle, because of its size, will not endanger above ground piping.

(4) *Facility tank car and tank truck loading/unloading rack (onshore).* (i) Tank car and tank truck loading/unloading procedures should meet the minimum requirements and regulation established by the Department of Transportation.

(ii) Where rack area drainage does not flow into a catchment basin or treatment facility designed to handle spills, a quick drainage system should be used for tank truck loading and unloading areas. The containment system should be designed to hold at least maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded in the plant.

(iii) An interlocked warning light or physical barrier system, or warning signs, should be provided in loading/unloading areas to prevent vehicular departure before complete disconnect of flexible or fixed transfer lines.

(iv) Prior to filling and departure of any tank car or tank truck, the lowermost drain and all outlets of such vehicles should be closely examined for leakage, and if necessary, tightened, adjusted, or replaced to prevent liquid leakage while in transit.

(5) *Oil production facilities (onshore)*—(i) *Definition.* An onshore production facility may include all wells, flowlines, separation equipment, storage facilities, gathering lines, and auxiliary non-transportation-related equipment and facilities in a single geographical oil or gas field operated by a single operator.

(ii) *Oil production facility (onshore) drainage.* (A) At tank batteries and central treating stations where an accidental discharge of oil would have a reasonable possibility of reaching navigable waters, the dikes or equivalent required under § 112.7(c)(1) should have drains closed and sealed at all times except when rainwater is being drained. Prior to drainage, the diked area should be inspected as provided in paragraphs (e)(2)(iii) (B), (C), and (D) of this section. Accumulated oil on the rainwater should be picked up and returned to storage or disposed of in accordance with approved methods.

(B) Field drainage ditches, road ditches, and oil traps, sumps or skimmers, if such exist, should be inspected at regularly scheduled intervals for accumulation of oil that may have escaped from small leaks. Any such accumulations should be removed.

(iii) *Oil production facility (onshore) bulk storage tanks.* (A) No tank should be used for the storage of oil unless its material and construction are compatible with the material stored and the conditions of storage.

(B) All tank battery and central treating plant installations should be provided with a secondary means of containment for the entire contents of the largest single tank if feasible, or alternate systems such as those outlined in § 112.7(c)(1). Drainage from undiked areas should be safely confined in a catchment basin or holding pond.

(C) All tanks containing oil should be visually examined by a competent person for condition and need for maintenance on a scheduled periodic basis. Such examination should include the foundation and supports of tanks that are above the surface of the ground.

(D) New and old tank battery installations should, as far as practical, be fail-safe engineered or updated into a fail-safe engineered installation to prevent spills. Consideration should be given to one or more of the following:

(*1*) Adequate tank capacity to assure that a tank will not overfill should a pumper/gauger be delayed in making his regular rounds.

(*2*) Overflow equalizing lines between tanks so that a full tank can overflow to an adjacent tank.

(*3*) Adequate vacuum protection to prevent tank collapse during a pipeline run.

(*4*) High level sensors to generate and transmit an alarm signal to the computer where facilities are a part of a computer production control system.

(iv) *Facility transfer operations, oil production facility (onshore).* (A) All above ground valves and pipelines should be examined periodically on a scheduled basis for general condition of items such as flange joints, valve glands and bodies, drip pans, pipeline supports, pumping well polish rod stuffing boxes, bleeder and gauge valves.

(B) Salt water (oil field brine) disposal facilities should be exained often, particularly following a sudden change in atmospheric temperature to detect possible system upsets that could cause an oil discharge.

(C) Production facilities should have a program of flowline maintenance to prevent spills from this source. The program should include periodic examinations, corrosion protection, flowline replacement, and adequate records, as appropriate, for the individual facility.

(6) *Oil drilling and workover facilities (onshore).* (i) Mobile drilling or workover equipment should be positioned or located so as to prevent spilled oil from reaching navigable waters.

(ii) Depending on the location, catchment basins or diversion structures may be necessary to intercept and contain spills of fuel, crude oil, or oily drilling fluids.

(iii) Before drilling below any casing string or during workover operations, a blowout prevention (BOP) assembly and well control system should be installed that is capable of controlling any well head pressure that is expected to be encountered while that BOP assembly is on the well. Casing and BOP installations should be in accordance with State regulatory agency requirements.

(7) *Oil drilling, production, or workover facilities (offshore).* (i) Definition: "An oil drilling, production or workover facility (offshore)" may include all drilling or workover equipment, wells, flowlines, gathering lines, platforms, and auxiliary nontransportation-related equipment and facilities in a single geographical oil or gas field operated by a single operator.

(ii) Oil drainage collection equipment should be used to prevent and control small oil spillage around pumps, glands, valves, flanges, expansion joints, hoses, drain lines, separators, treaters, tanks, and allied equipment. Drains on the facility should be controlled and directed toward a central collection sump or equivalent collection system sufficient to prevent discharges of oil into the navigable waters of the United States. Where drains and sumps are not practicable oil contained in collection equipment should be removed as often as necessary to prevent overflow.

(iii) For facilities employing a sump system, sump and drains should be adequately sized and a spare pump or equivalent method should be available to remove liquid from the sump and assure that oil does not escape. A regular scheduled preventive maintenance inspection and testing program should be employed to assure reliable operation of the liquid removal system and pump start-up device. Redundant automatic sump pumps and control devices may be required on some installations.

(iv) In areas where separators and treaters are equipped with dump valves whose predominant mode of failure is in the closed position and pollution risk is high, the facility should be specially equipped to prevent the escape of oil. This could be accomplished by extending the flare line to a diked area if the separator is near shore, equipping it with a high liquid level sensor that will automatically shut-in wells producing to the separator, parallel redundant dump valves, or other feasible alternatives to prevent oil discharges.

(v) Atmospheric storage or surge tanks should be equipped with high liquid level sensing devices or other acceptable alternatives to prevent oil discharges.

(vi) Pressure tanks should be equipped with high and low pressure sensing devices to activate an alarm and/or control the flow or other acceptable alternatives to prevent oil discharges.

(vii) Tanks should be equipped with suitable corrosion protection.

(viii) A written procedure for inspecting and testing pollution prevention equipment and systems should be prepared and maintained at the facility. Such procedures should be included as part of the SPCC Plan.

(ix) Testing and inspection of the pollution prevention equipment and systems at the facility should be conducted by the owner or operator on a scheduled periodic basis commensurate with the complexity, conditions and circumstances of the facility or other appropriate regulations.

(x) Surface and subsurface well shut-in valves and devices in use at the facility should be sufficiently described to determine method of activation or control, e.g., pressure differential, change in fluid or flow conditions, combination of pressure and flow, manual or remote control mechanisms. Detailed records for each well, while not necessarily part of the plan should be kept by the owner or operator.

(xi) Before drilling below any casing string, and during workover operations a blowout preventer (BOP) assembly and well control system should be installed that is capable of controlling any well-head pressure that is expected to be encountered while that BOP assembly is on the well. Casing and BOP installations should be in accordance with State regulatory agency requirements.

(xii) Extraordinary well control measures should be provided should emergency conditions, including fire, loss of control and other abnormal conditions, occur. The degree of control system redundancy should vary with hazard exposure and probable consequences of failure. It is recommended that surface shut-in systems have redundant or "fail close" valving. Subsurface safety valves may not be needed in producing wells that will not flow but should be installed as required by applicable State regulations.

(xiii) In order that there will be no misunderstanding of joint and separate duties and obligations to perform work in a safe and pollution free manner, written instructions should be prepared by the owner or operator for contractors and subcontractors to follow whenever contract activities include servicing a well or systems appurtenant to a well or pressure vessel. Such instructions and procedures should be maintained at the offshore production facility. Under certain circumstances and conditions such contractor activities may require the presence at the facility of an authorized representative of the owner or operator who would intervene when necessary to prevent a spill event.

(xiv) All manifolds (headers) should be equipped with check valves on individual flowlines.

(xv) If the shut-in well pressure is greater than the working pressure of the flowline and manifold valves up to and including the header valves associated with that individual flowline, the flowline should be equipped with a high pressure sensing device and shut-in valve at the wellhead unless provided with a pressure relief system to prevent over pressuring.

(xvi) All pipelines appurtenant to the facility should be protected from corrosion. Methods used, such as protective coatings or cathodic protection, should be discussed.

(xvii) Sub-marine pipelines appurtenant to the facility should be adequately protected against environmental stresses and other activities such as fishing operations.

(xviii) Sub-marine pipelines appurtenant to the facility should be in good operating condition at all times and inspected on a scheduled periodic basis for failures. Such inspections should be documented and maintained at the facility.

(8) *Inspections and records.* Inspections required by this part should be

in accordance with written procedures developed for the facility by the owner or operator. These written procedures and a record of the inspections, signed by the appropriate supervisor or inspector, should be made part of the SPCC Plan and maintained for a period of three years.

(9) *Security (excluding oil production facilities).* (i) All plants handling, processing, and storing oil should be fully fenced, and entrance gates should be locked and/or guarded when the plant is not in production or is unattended.

(ii) The master flow and drain valves and any other valves that will permit direct outward flow of the tank's content to the surface should be securely locked in the closed position when in non-operating or non-standby status.

(iii) The starter control on all oil pumps should be locked in the "off" position or located at a site accessible only to authorized personnel when the pumps are in a non-operating or non-standby status.

(iv) The loading/unloading connections of oil pipelines should be securely capped or blank-flanged when not in service or standby service for an extended time. This security practice should also apply to pipelines that are emptied of liquid content either by draining or by inert gas pressure.

(v) Facility lighting should be commensurate with the type and location of the facility. Consideration should be given to: (A) Discovery of spills occurring during hours of darkness, both by operating personnel, if present, and by non-operating personnel (the general public, local police, etc.) and (B) prevention of spills occurring through acts of vandalism.

(10) *Personnel, training and spill prevention procedures.* (i) Owners or operators are responsible for properly instructing their personnel in the operation and maintenance of equipment to prevent the discharges of oil and applicable pollution control laws, rules and regulations.

(ii) Each applicable facility should have a designated person who is accountable for oil spill prevention and who reports to line management.

(iii) Owners or operators should schedule and conduct spill prevention briefings for their operating personnel at intervals frequent enough to assure adequate understanding of the SPCC Plan for that facility. Such briefings should highlight and describe known spill events or failures, malfunctioning components, and recently developed precautionary measures.

Appendix—Memorandum of Understanding Between the Secretary of Transportation and the Administrator of the Environmental Protection Agency

Section II—Definitions

The Environmental Protection Agency and the Department of Transportation agree that for the purposes of Executive Order 11548, the term:

(1) "Non-transportation-related onshore and offshore facilities" means:

(A) Fixed onshore and offshore oil well drilling facilities including all equipment and appurtenances related thereto used in drilling operations for exploratory or development wells, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(B) Mobile onshore and offshore oil well drilling platforms, barges, trucks, or other mobile facilities including all equipment and appurtenances related thereto when such mobile facilities are fixed in position for the purpose of drilling operations for exploratory or development wells, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(C) Fixed onshore and offshore oil production structures, platforms, derricks, and rigs including all equipment and appurtenances related thereto, as well as completed wells and the wellhead separators, oil separators, and storage facilities used in the production of oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(D) Mobile onshore and offshore oil production facilities including all equipment and appurtenances related thereto as well as completed wells and wellhead equipment, piping from wellheads to oil separators, oil separators, and storage facilities used in the production of oil when such mobile facilities are fixed in position for the purpose of oil production operations, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(E) Oil refining facilities including all equipment and appurtenances related thereto as well as in-plant processing units, storage units, piping, drainage systems and waste treatment units used in the refining of oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(F) Oil storage facilities including all equipment and appurtenances related thereto as well as fixed bulk plant storage, terminal oil storage facilities, consumer storage, pumps and drainage systems used in the storage of oil, but excluding inline or breakout storage tanks needed for the continuous operation of a pipeline system and any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(G) Industrial, commercial, agricultural or public facilities which use and store oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(H) Waste treatment facilities including in-plant pipelines, effluent discharge lines, and storage tanks, but excluding waste treatment facilities located on vessels and terminal storage tanks and appurtenances for the reception of oily ballast water or tank washings from vessels and associated systems used for off-loading vessels.

(I) Loading racks, transfer hoses, loading arms and other equipment which are appurtenant to a nontransportation-related facility or terminal facility and which are used to transfer oil in bulk to or from highway vehicles or railroad cars.

(J) Highway vehicles and railroad cars which are used for the transport of oil exclusively within the confines of a nontransportation-related facility and which are not intended to transport oil in interstate or intrastate commerce.

(K) Pipeline systems which are used for the transport of oil exclusively within the confines of a nontransportation-related facility or terminal facility and which are not intended to transport oil in interstate or intrastate commerce, but excluding pipeline systems used to transfer oil in bulk to or from a vessel.

(2) "Transportation-related onshore and offshore facilities" means:

(A) Onshore and offshore terminal facilities including transfer hoses, loading arms and other equipment and appurtenances used for the purpose of handling or transferring oil in bulk to or from a vessel as well as storage tanks and appurtenances for the reception of oily ballast water or tank washings from vessels, but excluding terminal waste treatment facilities and terminal oil storage facilities.

(B) Transfer hoses, loading arms and other equipment appurtenant to a non-transportation-related facility which is used to transfer oil in bulk to or from a vessel.

(C) Interstate and intrastate onshore and offshore pipeline systems including pumps and appurtenances related thereto as well as in-line or breakout storage tanks needed for the continuous operation of a pipeline system, and pipelines from onshore and offshore oil production facilities, but excluding onshore and offshore piping from wellheads to oil separators and pipelines which are used for the transport of oil exclusively within the confines of a nontransportation-related facility or terminal facility and which are not intended to transport oil in interstate or intrastate commerce or to transfer oil in bulk to or from a vessel.

(D) Highway vehicles and railroad cars which are used for the transport of oil in interstate or intrastate commerce and the equipment and appurtenances related thereto, and equipment used for the fueling of locomotive units, as well as the rights-of-way on which they operate. Excluded are highway vehicles and railroad cars and motive power used exclusively within the confines of a nontransportation-related facility or terminal facility and which are not intended for use in interstate or intrastate commerce.

APPENDIX
F

PART 114—CIVIL PENALTIES FOR VIOLATION OF OIL POLLUTION PREVENTION REGULATIONS

NON-TRANSPORTATION RELATED ONSHORE AND OFFSHORE FACILITIES

AUTHORITY: Secs. 311(j), 501(a), Pub. L. 92-500, 86 Stat. 868, 885 (33 U.S.C. 1321(j), 1361(a)).

SOURCE: 39 FR 31602, Aug. 29, 1974, unless otherwise noted.

NON-TRANSPORTATION RELATED ONSHORE AND OFFSHORE FACILITIES

§ 114.1 General applicability.

Owners or operators of facilities subject to § 112.3 (a), (b) or (c) of this subchapter who violate the requirements of Part 112 of this Subchapter D by failing or refusing to comply with any of the provisions of § 112.3, 112.4, or 112.5 of this subchapter shall be liable for a civil penalty of not more than $5,000 for each day such violation continues. Civil penalties shall be assessed and compromised in accordance with this part. No penalty shall be assessed until the owner or operator shall have been given notice and an opportunity for hearing in accordance with this part.

§ 114.2 Violation.

Owners or operators of facilities shall be liable for a civil penalty for noncompliance with the requirements of Part 112 of this subchapter, including but not limited to failure to:

(a) Prepare a Spill Prevention Control and Countermeasure (SPCC) plan in accordance with § 112.3 of this subchapter;

(b) Have a SPCC plan certified by a Registered Professional Engineer as required by § 112.3 of this subchapter;

(c) Implement the SPCC plan as required by § 112.3 of this subchapter;

(d) Submit information after a spill as required by § 112.4 of this subchapter;

(e) Amend plan as required by § 112.4 of this subchapter;

(f) Implement amendment as required by § 112.4 of this subchapter;

(g) Amend plan after change in facility design as required by § 112.6 of this subchapter;

(h) Review plan every three years as required by § 112.5 of this subchapter;

(i) Amend plan after review as required by § 112.5; or

(j) Have amendment certified as required by § 112.5 of this subchapter and implemented.

§ 114.3 Determination of penalty.

(a) In determining the amount of the penalty to be assessed the following factors shall be considered:

(1) Gravity of the violation; and

(2) Demonstrated good faith efforts to achieve rapid compliance after notification of a violation.

(b) The amount of the civil penalty to be assessed may be settled by compromise at any stage of the proceedings.

(c) Civil penalties may be assessed by the Regional Administrator where there is no request for a hearing pursuant to § 114.5.

§ 114.4 Notice of Violation.

The Notice of Violation shall be sent to the person charged with a violation and shall specify the:

(a) Date of issuance;

(b) Nature of violation, including the law or regulation that he is charged with violating;

(c) Amount of the maximum penalty;

(d) Amount of the proposed civil penalty;

(e) The right to present written explanations, information or any materials in answer to the charges or in mitigation of the penalty, or bearing on the person's efforts to achieve compliance after notification of the violation;

(f) Manner of the payment of any money which may be paid to the United States;

(g) Right to request a hearing; and

(h) The procedures for requesting a hearing including the right to be represented by counsel.

§ 114.5 Request for hearing.

Within thirty (30) days of the date of receipt of a Notice of Violation, the person named in the Notice may request a hearing by submitting a written request signed by or on behalf of such person by a duly authorized officer, director, agent, or attorney-in-fact, to the Regional Administrator.

(a) Requests for hearings shall:

(1) State the name and address of the person requesting the hearing;

(2) Enclose a copy of the Notice of Violation; and

(3) State with particularity the issues to be raised by such person at the hearing.

(b) After a request for hearing which complies with the requirements of paragraph (a) of this section has been filed, a hearing shall be scheduled for the earliest practicable date.

(c) Extensions of the time for the commencement of the hearing may be granted for good cause shown.

§ 114.6 Presiding Officer.

The hearing shall be conducted by the Presiding Officer. The Regional Administrator may designate any attorney in the Environmental Protection Agency to act as the Presiding Officer. No person shall serve as a Presiding Officer where he has any prior connection with the case including without limitation the performance of investigative or prosecuting functions or any other such functions. The Presiding Officer appointed shall have the full authority to conduct the hearing, decide issues and to assess a civil penalty as appropriate.

§ 114.7 Consolidation.

The Presiding Officer may, in his discretion, order consolidation of any hearings held under this part and arising within one Region whenever he determines that consolidation will expedite or simplify the consideration of the issues presented. The Administrator may, in his discretion, order consolidation, and designate one Region to be responsible for the conduct of any hearings held under this part which arise in different Regions whenever he determines that consolidation will expedite or simplify the consideration of the issues presented. Consolidation shall not affect the right of any person to raise issues that could have been raised if consolidation had not occurred. At the conclusion of the hearing the Presiding Officer shall render a separate decision for each separate civil penalty case.

§ 114.8 Prehearing conference.

The Presiding Officer may hold one or more prehearing conferences and may issue a hearing agenda which may include, without limitation, decisions with regard to any or all the following:

(a) Stipulations and admissions;

(b) Disputed issues of fact;

(c) Hearing procedures including submission of oral or written testimony and the time allotted for oral arguments; and

(d) Any other matter which may expedite the hearing or aid in disposition of any issues raised therein.

§ 114.9 Conduct of hearing.

The hearing shall be held in the general location of the facility where the alleged violation occurred or as agreed to by EPA and the person charged. The Presiding Officer shall have the duty to conduct a fair and impartial hearing, to take action to avoid unnecessary delay in the disposition of proceedings, and to maintain order. The person charged with the violation may offer relevant facts, statements, explanations, and other items which such person feels should be considered in defense to the charges, bearing on the person's efforts to achieve compliance after notification of the violation or which may bear upon the penalty to be assessed. The EPA or other appropriate Agency personnel shall have the opportunity to offer facts, statements, explanations and other items including testimony of other appropriate Agencies personnel in order for the Presiding Officer to be fully informed. In the event the matter cannot be resolved by settlement the person charged with the violation shall be informed in writing, of the decision of the Presiding Officer and shall be advised of his right to appeal.

§ 114.10 Decision.

Within thirty (30) days after the conclusion of the hearings, the Presiding Officer shall issue findings with respect to the matter, including, where appropriate to the amount of the civil penalty. In assessing the civil penalty the Presiding Officer shall consider the factors set forth in § 114.3. A copy of the Presiding Officer's decision shall be sent to the person charged in the Notice of Violation. The decision of the Presiding Officer shall become the final decision of the Environmental Protection Agency unless within fifteen (15) days from the date of receipt of such decision, the person assessed the penalty appeals the decision to the Administrator, or unless the Administrator shall have stayed the effectiveness of the decision pending review.

§ 114.11 Appeal to Administrator.

(a) The person assessed a penalty in the Presiding Officer's determination shall have the right to appeal an adverse decision to the Administrator upon filing a written Notice of Appeal in the form required by paragraph (b) of this section within fifteen (15) days of the date the receipt of the Presiding Officer's decision.

(b) The Notice of Appeal shall:

(1) State the name and address of the person filing the Notice of Appeal;

(2) Contain a concise statement of the facts on which the person relies;

(3) Contain a concise statement of the legal basis on which the person relies; and

(4) Contain a concise statement setting forth the action which the person proposed that the Administrator take.

(c) The Administrator may delegate this authority to act in a given case.

(d) The Administrator, after a Notice of Appeal in proper form has been filed, shall render a decision with respect to the appeal promptly. In rendering his decision, the Administrator may adopt, modify, or set aside the decision of the Presiding Officer in any respect and shall include in his decision a concise statement of the basis therefore. The decision of the Administrator on appeal shall be effective when rendered.

APPENDIX
G

Subpart B—Notice of the Discharge of Oil or a Hazardous Substance

§ 153.201 Purpose.

The purpose of this subpart is to prescribe the manner in which the notice required in section 311(b)(5) of the Act is to be given and to list the government officials to receive that notice.

§ 153.203 Procedure for the notice of discharge.

Any person in charge of a vessel or of an onshore or offshore facility shall, as soon as they have knowledge of any discharge of oil or a hazardous substance from such vessel or facility in violation of section 311(b)(3) of the Act, immediately notify the National Response Center (NRC), U.S. Coast Guard, 2100 Second Street, SW., Washington, DC 20593, toll free telephone number 800-424-8802 (in Washington, D.C. metropolitan area, 426-2675). If direct reporting to the NRC is not practicable, reports may be made to the Coast Guard or EPA predesignated OSC for the geographic area where the discharge occurs. All such reports shall be promptly relayed to the NRC. If it is not possible to notify the NRC or the predesignated OSC immediately, reports may be made immediately to the nearest Coast Guard unit, provided that the person in charge of the vessel or onshore or offshore facility notifies the NRC as soon as possible.

NOTE: Geographical jurisdiction of Coast Guard and EPA OSC's are specified in the applicable Regional Contingency Plan. Regional Contingency Plans are available at Coast Guard District Offices and EPA Regional Offices as indicated in Table 2. Addresses and telephone numbers for these offices are listed in Table 1.

[CGD 84-067, 51 FR 17966, May 16, 1986]

§ 153.205 Fines.

Section 311(b)(5) of the Act prescribes that any person who fails to notify the appropriate agency of the United States Government immediately of a discharge is, upon conviction, subject to a fine of not more than $10,000, or to imprisonment of not more than one year, or both.

TABLE 1.—ADDRESSES AND TELEPHONE NUMBERS OF COAST GUARD DISTRICT OFFICES AND EPA REGIONAL OFFICES

	Address	Telephone
	EPA Regional Offices	
Region:		
I	John F. Kennedy Federal Bldg., Boston, MA 02203.	617-223-7265
II	26 Federal Plaza, New York, NY 10278.	201-548-8730
III	841 Chestnut Street, Philadelphia, PA 19107.	215-597-9898
IV	345 Courtland Street, NE, Atlanta, GA 30365.	404-347-4062
V	230 S. Dearborn Street, 13th Floor, Chicago, IL 60604.	312-353-2318
VI	First International Building, 1201 Elm Street, Dallas, TX 75270.	214-767-2666
VII	726 Minnesota Avenue, Kansas City, KS 66101.	913-236-3778
VIII	One Denver Place, 999 18th Street, Suite 1300, Denver, CO 80202-2413.	303-293-1788
IX	215 Fremont Street, San Francisco, CA 94105.	415-974-8131
X	1200 6th Avenue, Seattle, WA 98101.	206-442-1263
	Coast Guard District Offices	
District:		
1st	408 Atlantic Ave., Boston, MA 02110-2209.	617-223-8444
2nd	1430 Olive St., St. Louis, MO 63103.	314-425-4655
3rd	Governors Island, New York, NY 10004-5098.	212-668-7152
5th	Federal Bldg., 431 Crawford St., Portsmouth, VA 23705-5004.	804-398-6638
7th	Federal Bldg., Room 1221, 51 S.W. 1st Ave., Miami, FL 33130.	305-350-5276
8th	Hale Boggs Federal Bldg., 500 Camp St., New Orleans, LA 70130-3396.	504-589-6296
9th	1240 East 9th St., Cleveland, OH 44199.	216-522-3919
11th	Union Bank Bldg., 400 Oceangate, Long Beach, CA 90822-5399.	213-590-2301
12th	Coast Guard Island, Alameda, CA 94501.	415-437-3465
13th	Federal Bldg., 915 Second Ave., Seattle, WA 98174.	206-442-5850
14th	Prince Kalanianaole Federal Bldg., 300 Ala Moana Blvd., 9th Floor, Honolulu, HI 96850.	808-546-7510
17th	P.O. Box 3-5000, Juneau, AK 99802.	907-586-7195

[CGD 84-067, 51 FR 17966, May 16, 1986]

TABLE 2.—STANDARD ADMINISTRATIVE REGIONS OF STATES AND CORRESPONDING COAST GUARD DISTRICTS AND EPA REGIONS

States and EPA region	Coast Guard district
Region I:	
Maine	1st
New Hampshire	1st
Vermont:	
All except Northwestern portion	1st
Northwestern portion	3rd
Massachusetts	1st
Connecticut	3rd
Rhode Island	1st
Region II:	
New York:	
Coastal area and Eastern portion	3rd
Great Lakes area and other portions	9th
New Jersey	3rd
Puerto Rico	7th
Virgin Islands	7th
Region III:	
Pennsylvania:	
Eastern portion	3rd
Great Lakes area	9th
Southwestern portion	2nd
Maryland	5th
Delaware	3rd
West Virginia	2nd
Virginia	5th
District of Columbia	5th
Region IV:	
Kentucky	2nd
Tennessee	2nd
North Carolina	5th
South Carolina	7th
Georgia	7th
Florida:	
Atlantic and Gulf coasts	7th
Panhandle area	8th
Alabama:	
Southern	8th
Northern	2nd
Mississippi:	
Southern	8th
Northern	2nd
Region V:	
Minnesota:	
Great Lakes area	9th
Inland rivers area	2nd
Wisconsin:	
Great Lakes area	9th
Inland rivers area	2nd
Michigan	9th
Illinois:	
Great Lakes area	9th
Inland rivers area	2nd
Indiana:	
Great Lakes area	9th
Inland rivers area	2nd
Ohio:	
Great Lakes area	9th
Inland rivers area	2nd
Region VI:	
New Mexico	8th
Texas	8th
Oklahoma	2nd
Arkansas	2nd
Louisiana	8th
Region VII:	
Nebraska	2nd

TABLE 2.—STANDARD ADMINISTRATIVE REGIONS OF STATES AND CORRESPONDING COAST GUARD DISTRICTS AND EPA REGIONS—Continued

States and EPA region	Coast Guard district
Iowa	2nd
Kansas	2nd
Missouri	2nd
Region VIII:	
Montana	13th
Wyoming	2nd
Utah:	
Northern	12th
Southern	11th
Colorado	2nd
North Dakota	2nd
South Dakota	2nd
Region IX:	
California:	
Northern	12th
Southern	11th
Nevada:	
Northern	12th
Southern	11th
Arizona	11th
Hawaii	14th
Guam	14th
American Samoa	14th
Trust Territory of the Pacific Islands	14th
Northern Mariana Islands	14th
Region X:	
Washington	13th
Oregon	13th
Idaho	13th
Alaska	17th

[CGD 84-067, 51 FR 17966, May 16, 1986]

13.1 WORKSHOP F: UNDERGROUND STORAGE TANK (UST) COMPLIANCE

13.2 ATTACHMENTS

- "Facing the Unexpected; Cleanup of Underground Storage Tank Releases Using Pump and Treat Methods"
- Musts for USTs

13.1 WORKSHOP F: UNDFRGROUND STORAGE TANK (UST) COMPLIANCE

Wayne Naylor, Chief UST/LUST Section EPA, Region III.

Mr. Naylor presented the requirements of the Underground Storage Tank Program (UST). Program goals include preventing leaks in underground tanks, locating existing leaks, cleaning up releases and building additional programs at the state level. The federal UST program regulates all petroleum and hazardous waste tanks that are underground. Farm and residential heating oil tanks less than 1,100 gallons are excluded from the regulations. The following attainments present important points of the UST program as defined in the code of federal regulations section 280.

FOR MORE INFORMATION

Contact the UST agency and UIC agency in your state or the EPA Region III UST/UIC agencies.

U.S. EPA Region III
841 Chestnut Building
Philadelphia, PA 19107 Phone: 215/597-7354 UST Program
For D.C., PA, and VA: 215/597-9928 UIC Program

Delaware UST Program
Dept of Natural Resources and Environmental Control
715 Grantham Lane
New Castle, DE 19720 Phone: 302/323-4588

District of Columbia UST Program
Pesticides & Hazardous Waste Mgmt. Branch
614 H Street, NW, Room 505
Washington, D.C. 20013 Phone: 202/783-3205

Maryland UST Program
Department of Environment
2500 Broening Highway
Baltimore, MD 21224 Phone: 301/631-3442

Pennsylvania UST Program
DER - Bureau of Water Quality Management
3600 Vartan Way - P.O. Box 8761
Harrisburg, PA 17105 Phone: 717/657-4080

Virginia UST Program
Virginia Water Control Board
2111 N. Hamilton Street
Richmond, VA 23230 Phone: 804/367-0970

West Virginia UST Program
Div. of Natural Resources - Waste Mgmt. Section
1356 Hansford Street
Charleston, WV 25301 Phone: 304/348-6371

Delaware UIC Program
DNREC - Water Supply Branch
89 Kings Highway
Dover, DE 19903 Phone: 302/736-4793

Maryland UIC Program
Dept. of the Environment - Groundwater Div.
2500 Broening Highway
Baltimore, MD 21224 Phone: 301/631-3306

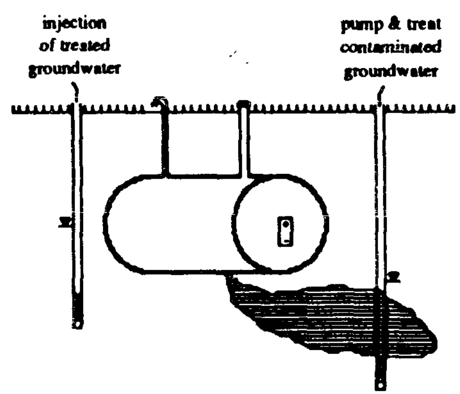
West Virginia UIC Program
Department of Natural Resources
1201 Greenbrier Street
Charleston, WV 25311 Phone: 304/348-3614

United States
Environmental Protection
Agency September 1990

Region III - UIC Section

EPA

Facing the Unexpected ... Cleanup of Underground Storage Tank Releases Using Pump and Treat Methods



Q&A

An owner/operator of a leaking underground storage tank (UST) may be faced with the formidable task of cleaning up the site. Below are some questions you may need to answer if a spill or release occurs at your facility.

Q: What is a spill or overfill?
A: Discharge of a substance to the ground surface that exceeds 25 gallons or causes a sheen on surface water.

Q: Who should you contact when a spill occurs?
A: Report a spill to the implementing UST agency within 24 hours. A list of contacts is provided in this brochure.

Q: What is a substance release?
A: Any spilling, leaking, emitting, discharging, escaping, leaching or disposing from an UST into groundwater, surface water, or subsurface soils.

Q: Who should you contact in the event of a release?
A: Report a release to the implementing UST agency within 24 hours. A list of contacts is provided in this brochure.

Q: How long do you have to confirm a release?
A: Investigate and confirm a release within 7 days. The investigation should include a system check and a site check.

Q: What initial measures must you take when a potential release occurs?
A: Release abatement measures should begin immediately and include:
1. remove substance from UST to prevent further releases
2. inspect and prevent further migration of the release
3. monitor and mitigate hazards posed by the release
4. remedy any hazards due to the release (complying with state and local laws)
5. measure for the presence of the release where contamination is most likely
6. determine the presence of free product and begin product removal

A report describing the measures used should be submitted to the implementing agency within 20 days of the release.

Q: Are the initial abatement measures enough?
A: The implementing UST agency may require a Corrective Action Plan (CAP) including:
1. free product characterization
2. site hydrogeologic characterization
3. proximity, quality, and uses of nearby surface and groundwater
4. potential effects of residual contamination
5. exposure assessment

A report describing information on the nature and amount of release, site conditions, and results of the site and free product check must be submitted within 45 days of the release even if a CAP is not required. A free product removal report must also be submitted within 45 days of the release.

Q: What remedial methods are available?
A: For contaminated soils, methods such as landfarming, soil venting, bioremediation, soil removal, and thermal stripping exist. For groundwater remediation, the general trend is to pump the water from drilled wells and then to route it to treatment systems such as: oil/water separators, air stripping, or granular activated carbon. After treatment the water may be sent to a sewer, a surface water, or may be reinjected through a well. If necessary, a consultant should be contacted regarding the use of these methods.

Q: When cleanup involves injection wells, what are your responsibilities?
A: Cleanup using injection wells may begin under an emergency permit provided that you:
1. notify the UST and UIC implementing agency of your cleanup intention
2. obtain an emergency permit from the UIC implementing agency (EPA Region III) if located within the Commonwealth of Pennsylvania or Virginia or within the District of Columbia - the respective UIC implementing agencies in Delaware, Maryland, or West Virginia will determine whether a permit is necessary in these states
3. comply with conditions imposed by both the UST and UIC agencies
4. incorporate the self-initiated cleanup in the CAP as required

Q: How "clean" must the soil and groundwater be after cleanup is completed?
A: To the UST standards or Safe Drinking Water standards required by the implementing agency. Contaminant level standards vary from state to state and must be determined on a site specific basis.

Q: When cleanup is completed, what happens to the drilled injection wells?
A: A plan for plugging and abandonment of the wells is required as part of the UIC permit application. Wells are to be properly sealed and abandoned when corrective action is terminated so that the movement of fluid into an underground source of drinking water (USDW) is prevented.

As an owner/operator of a leaking underground storage tank (UST) site, certain requirements set forth under the UST program must be followed. The code of federal regulations section 280 details these requirements. When remediation by pump and treat methods involves the use of shallow remediation injection wells, owners/operators must follow the guidelines of the EPA Underground Injection Control (UIC) program which is described in the code of federal regulations in sections 144 through 146. Eight specific items encountered with both the UST and UIC programs are listed so that a comparison of the regulations can be made quickly. Refer to the listed citations for greater detail of responsibilities. In the States of Delaware and West Virginia, the UIC program is run by the State UIC agency and permit inquiries for injection wells should be directed to the State contacts. U.S.EPA Region III implements the UIC program in the District of Columbia, Pennsylvania, and Virginia; therefore, permit inquiries should be directed to the Region III office. Maryland does not require the issuance of permits for these wells; however, injection wells are included under State order when used for corrective action.

"Quick Look" Code Reference

Item	Citation	UST Program	Citation	UIC Program
1. Broad Authority		1984 HSWA Amendments to RCRA 1986 SARA Amendments		Part C of SDWA of 1974 RCRA as amended
2. Definition	40CFR280.12	One of a combination of tanks (including underground pipes) that is used to contain regulated substances and whose volume is 10% or more beneath the ground surface	40CFR144.3	Subsurface emplacement of "fluids" through a bored, drilled, or driven well; or through a dug well, where the depth of the well is greater than the largest surface dimension
3. Permit Authority	40CFR280.22	nothing for cleanup - tank owners/ operators must submit notification form for tank installation	40CFR144.4 40CFR144.24 40CFR144.31 40CFR144.33 40CFR144.34	may be affected by other Federal laws Class V authorization by rule Authorization by permit Area permit for multiple wells Emergency permits may be authorized for a duration of 90 days
4. Enforcement Authority	40CFR281.41	not covered in section 280 1. restrain by order 2. sue in courts 3. assess/sue to recover penalties (i) failure to notify or submitting false information for tank notification up to $10,000 or more per tank (ii) noncompliance with state standards/requirements - $10,000 or more per tank per day	40CFR144.13 40CFR145.13	when a Class V well violates 40 CFR Part 142 of prim. drinking water regs. 1. require injector to obtain permit 2. order injector to take actions 3. take enforcement action enforcement of state programs 1. restrain by order 2. sue in courts 3. assess/sue to recover penalties (i) $2500/day/violation (ii) criminal fines ($5000/day) against person willfully violating program requirements
5. Monitoring	40CFR280.41 40CFR280.43 40CFR280.52 40CFR280.64	tanks monitored every 30 days for leak detect leaks by: 1. inventory control 2. manual tank gauging 3. tank tightness testing 4. automatic tank gauging 5. vapor monitoring 6. groundwater monitoring 7. interstitial monitoring under release investigation owner/ operator selects sample types, locations, and measurement methods appropriate for the contaminant released remove product to maximum extent as determined by the implementing agency	40CFR144.51	1. samples should be representative of monitored activity 2. records of monitoring data must be retained
6. Corrective Action	40CFR280.50 40CFR280.52 40CFR280.53 40CFR280.62 40CFR280.63 40CFR280.64 40CFR280.66	report leak to agency within 24 hours investigate/confirm release within 7 days by system or site check contain/clean up spill or overfill within 24 hrs. & start corr. action: 1. spill exceeds 25 gal. or causes sheen on surface water 2. when spill exceeds amount reportable under CERCLA initial abatement measures-submit report within 20 days of release within 45 days of release submit info on nature & amount of release, site conditions, & results of site check within 45 days of release submit free product removal report items included in CAP - may begin cleanup before CAP is approved with provisions	40CFR144.25 40CFR144.52 40CFR144.55 40CFR146.7	injection wells must be permitted wells must be properly sited and constructed wells must be properly sealed and abandoned to prevent any movement of fluid into USDW after remediation criteria & factors considered for corrective action adequacy
7. Public Notice	40CFR280.67	1. provide notice to public when release requires CAP (by agency) 2. make release info available for public inspection 3. may hold public meeting before approving CAP 4. notify public if CAP does not achieve clean up levels	40CFR124.10 40CFR124.11 40CFR124.12 40CFR144.5	public notice of permit actions and public comment period public comment and requests for public hearings public hearings may make info available to public if no claim of confidentiality is made
8. Financial Resp.	40CFR280.93 40CFR280.95 40CFR280.96 40CFR280.97 40CFR280.98 40CFR280.99 40CFR280.100 40CFR280.101 40CFR280.102 40CFR280.103	for corr. action for cases of bodily injury & property damage due to leak max. collectible amounts given demonstrate F.R. by: 1. financial test of self-insurance 2. guarantee 3. insur. & risk retention coverage 4. surety bond 5. letter of credit 6. state-required mechanism 7. state fund or state assurance 8. trust fund 9. standby trust fund	40CFR144.52	resources to close, plug, & abandon well operation must be provided - demonstrate F.R. by: 1. surety bond 2. adequate assurance (i.e. financial statements) 3. letter of credit with standby trust 4. trust agreement

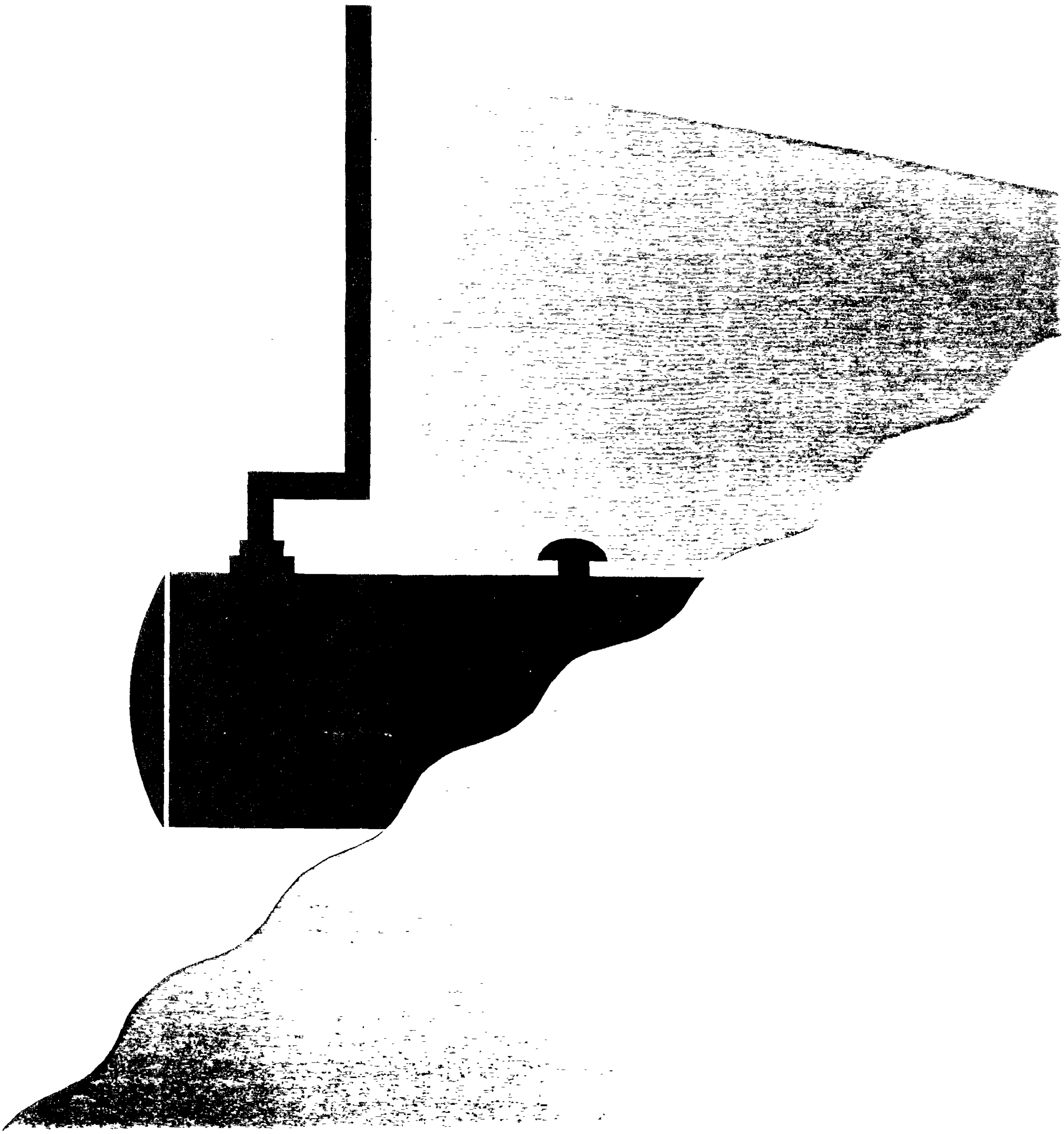
United States Environmental Protection Agency

Office of Underground Storage Tanks Washington, D.C. 20460

EPA/530/UST-88/008
September 1988

EPA

Musts for USTs



Musts for USTs

A Summary of the New Regulations for Underground Storage Tank Systems

U.S. Environmental Protection Agency
Office of Underground Storage Tanks

September 1988

Acknowledgement

The text of this booklet was prepared by Jay Evans for
EPA's Office of Underground Storage Tanks.

TABLE OF CONTENTS

*The financial responsibility requirements are not summarized in this booklet. A complete explanation of your financial responsibility requirements will appear in the Federal Register and in an EPA brochure later in 1988.

WHAT ARE THESE REGULATIONS ABOUT?

The U.S. Environmental Protection Agency (EPA) has written regulations for many of the nation's underground storage tank systems. This booklet briefly describes the new **technical requirements** for these systems, which include **tanks and piping**. You can find the complete regulations in the **Federal Register**. Properly managed, underground storage tank systems -- often called USTs -- will not threaten our health or our environment.

Why Has EPA Written These New Regulations?

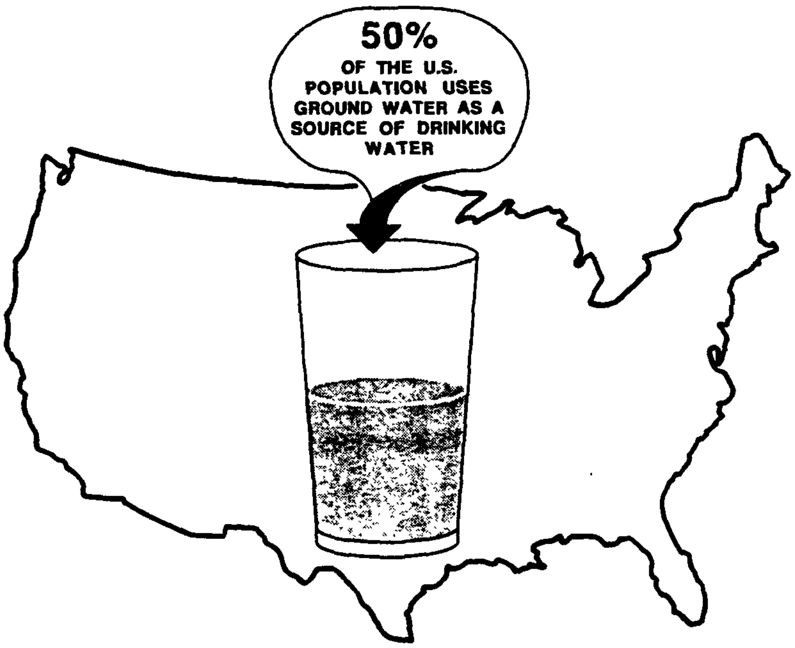
Several million underground storage tank systems in the United States contain petroleum or hazardous chemicals. Tens of thousands of these USTs, including their piping, are currently leaking. Many more are expected to leak in the future. Leaking USTs can cause fires or explosions that threaten human safety. In addition, leaking USTs can contaminate nearby ground water. Because many of us depend on ground water for the water we drink, Federal legislation seeks to safeguard our nation's ground-water resources.

Congress responded in 1984 to the problem of leaking USTs by adding Subtitle I to the Resource Conservation and Recovery Act (RCRA). Subtitle I requires EPA to develop regulations to protect human health and the environment from leaking USTs.

What Are The Goals Of The UST Regulations?

EPA has developed the UST regulations to make sure the following goals are reached:

- To **prevent** leaks and spills.
- To **find** leaks and spills.
- To **correct** the problems created by leaks and spills.
- To make sure that **owners and operators** of USTs **can pay** for correcting the problems created if their USTs leak.
- To make sure each **State** has a regulatory program for USTs that is as strict as or stricter than the Federal regulations.



WHY WORRY ABOUT LEAKS AND SPILLS?

◆ ***Because** your **tank or its piping may leak.*** As many as 25 percent of all underground storage tanks (USTs) may now be leaking. Many more will leak in the near future, possibly including yours. Your tank or its piping might be leaking right now. If a tank system is past its prime (over 10 years old), especially if it's not protected against corrosion, the potential for leaking increases dramatically. Newer tank systems (especially the piping) can also leak, and spills can happen anytime. Don't let your profits drain away.

◆ ***Because it's in** your **best interest.*** Leaking UST sites can be very costly to clean up. Imagine how much money you'd lose if your tank could not be used for weeks during lengthy cleanups or if local residents sued you for property damages. The costs can run into the thousands, perhaps as much as $100,000 and more. Detect and clean up spills or leaks -- before they hurt you financially.

◆ ***Because it's the law.*** But it's the law for good reason. Much of our country depends on ground water for drinking water, and leaked or spilled petroleum can contaminate this vital resource. Explosions are another potential hazard. Many State and local governments, therefore, already require specific steps to prevent, detect, or clean up leaks and spills. Others will soon have similar requirements. Check with your local and State governments to learn what requirements apply to you.

◆ ***Because it's for the good of the community and the environment.*** Leaks and spills can have serious consequences. Petroleum can contaminate soil, drinking water supplies, and air. Petroleum and its resulting vapors can also accumulate in nearby confined spaces, such as septic tanks, sewers, and the basements of homes. These vapors are poisonous and can cause a fire or explosion.

How Will These Regulations Affect You?

The regulations describe the steps you -- the tank owner or operator -- need to take to help protect our health and environment. These steps will also help you avoid the high cost of cleaning up the environment and defending yourself in legal actions that can result if your tank or its piping leaks.

You should note the following major points of the UST regulations:

- If you install an UST after December 1988, it must meet the requirements for new USTs concerning correct installation, spill and overfill prevention, corrosion protection, and leak detection (see pages 7-11).
- If you have an UST that was installed before December 1988, it must meet two major requirements --
    1) Requirements for corrosion protection and spill and overfill prevention (see page 13).
    2) Leak detection requirements (see pages 14-15).
- You must take corrective action in response to leaks (see pages 19-20).
- You must follow closure requirements for tanks you temporarily or permanently close (see pages 23-24).
- You are financially responsible for the cost of cleaning up a leak and compensating other people for bodily injury and property damage caused by your leaking UST.

Although these points are discussed in the following sections, additional information appears in the "Technical Questions & Answers" section starting on page 31.

What's Your "Financial Responsibility" For Petroleum Leaks?

A complete explanation of your financial responsibility requirements will appear in the Federal Register and in an EPA brochure later in 1988.

In general, owners or operators of petroleum USTs must be able to demonstrate their ability to pay for damage that could be caused if their tanks leaked. These payments would need to cover the costs of cleaning up a site (see page 20) and compensating other people for bodily injury and property damage.

Who Is "The Regulatory Authority"?

This booklet describes EPA's basic requirements for USTs, but your State or local regulatory authority may have requirements that are somewhat different or more strict. You will need to identify your regulatory authority and its specific requirements for your USTs. If you are not sure who your regulatory authority is, call your local fire marshall for help.

What's An "UST"?

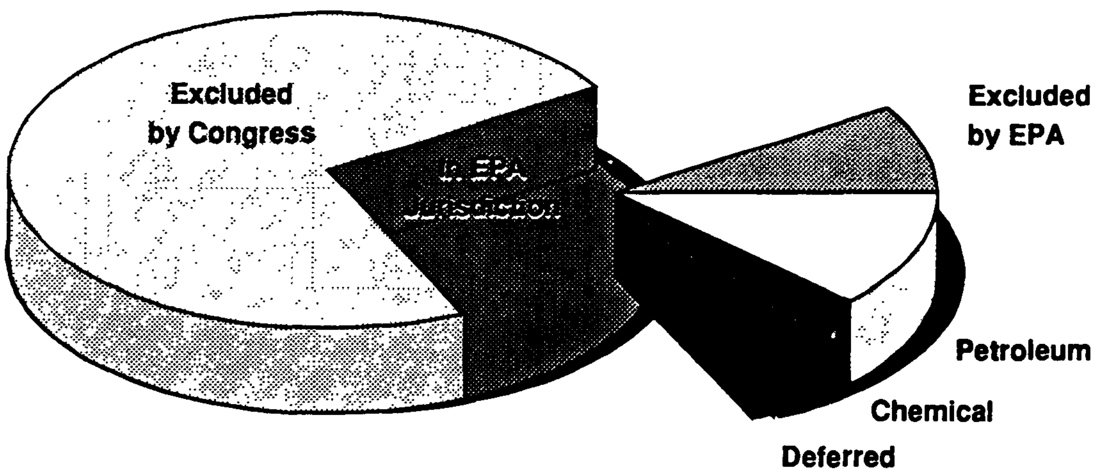
An UST is any tank, including underground piping connected to the tank, that has at least 10 percent of its volume underground. The regulations apply only to USTs storing either petroleum or certain hazardous chemicals.

The "For Chemical USTs Only" section starting on page 27 identifies hazardous chemicals and special requirements for chemical USTs. Generally, the requirements for both petroleum and chemical USTs are very similar.

Some kinds of tanks are not covered by these regulations:

- Farm and residential tanks holding 1,100 gallons or less of motor fuel used for noncommercial purposes.
- Tanks storing heating oil used on the premises where it is stored.
- Tanks on or above the floor of underground areas, such as basements or tunnels.
- Septic tanks and systems for collecting storm water and wastewater.
- Flow-through process tanks.
- Tanks holding 110 gallons or less.
- Emergency spill and overfill tanks.

Other storage areas that might be considered "tanks" are also excluded, such as surface impoundments and pits. Some "tanks," such as field-constructed tanks, have been deferred from most of the regulations. The regulations published in the **Federal Register** fully identify various tank types and which requirements apply to them.



UST Program Scope

WHY DO USTs CAUSE PROBLEMS?

No Corrosion Protection

Most of the UST systems already in the ground have tanks and piping made of bare steel. When unprotected steel is buried in the ground, it can be eaten away by corrosion. The UST regulations require corrosion protection for all USTs. The "Technical Questions & Answers" section explains how corrosion works and ways to defeat it (see pages 31 and 32).

Spills and Overfills

In addition to leaks from tanks and piping, spills and overfills cause many UST releases. When more petroleum is delivered into the tank than it can hold, an overfill happens. When the delivery truck's hose is disconnected incorrectly, a spill results. The "Technical Questions & Answers" section identifies ways to combat spills and overfills (see page 33).

Installation Mistakes

Tanks and piping also leak if they are not put in the ground properly. For example, if poorly selected or compacted backfill material is used when covering the UST, or if pipe fittings are inadequately attached to the UST, then leaking can result. You can avoid mistakes made during installation by using an installer who carefully follows approved installation procedures. The "Technical Questions & Answers" section identifies approved installation procedures (see page 33).

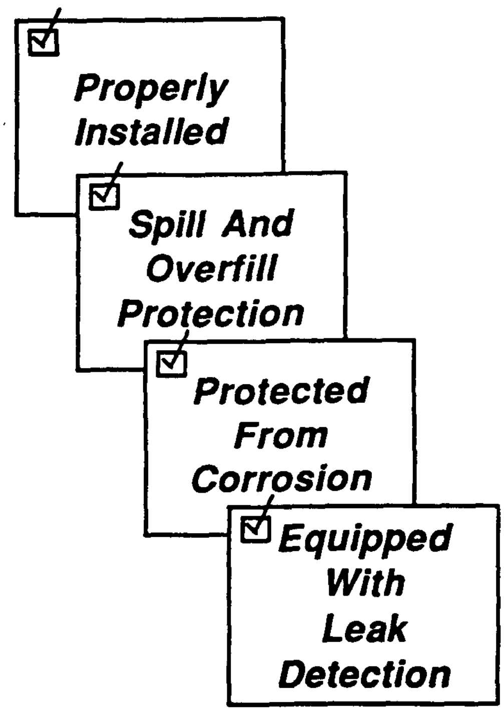
Piping Failures

EPA studies show that most leaks result from piping failure. Piping is smaller and less sturdy than tanks. It is assembled in the field with numerous connections and usually installed near the ground's surface. As a result, piping suffers much more than tanks from the effects of installation mistakes, excessive surface loads, the stress of underground movement, and corrosion. Using a skilled installer is even more critical to the proper installation of piping. It is important to remember that the regulations apply to the entire UST system -- both **tanks and piping.**

WHAT DO NEW PETROLEUM USTs NEED?

You must meet four requirements when you install a new UST system:

- You must certify that the tank and piping are installed properly according to industry codes.
- You must equip the UST with devices that prevent spills and overfills. Also, you must follow correct tank filling practices.
- You must protect the tank and piping from corrosion.
- You must equip both the tank and piping with leak detection.



The following sections provide basic information on these requirements. Also, see the "Technical Questions & Answers" section starting on page 31 for more information.

REMEMBER...

New UST systems are those that are installed after December 1988.

Those USTs installed between May 1985 and December 1988 must meet two minimum requirements:

- The UST must prevent releases due to corrosion or structural failure.
- The stored contents must be compatible with the tank's interior wall.

After December 1988, these older USTs must meet the requirements for existing USTs (see pages 13-17).

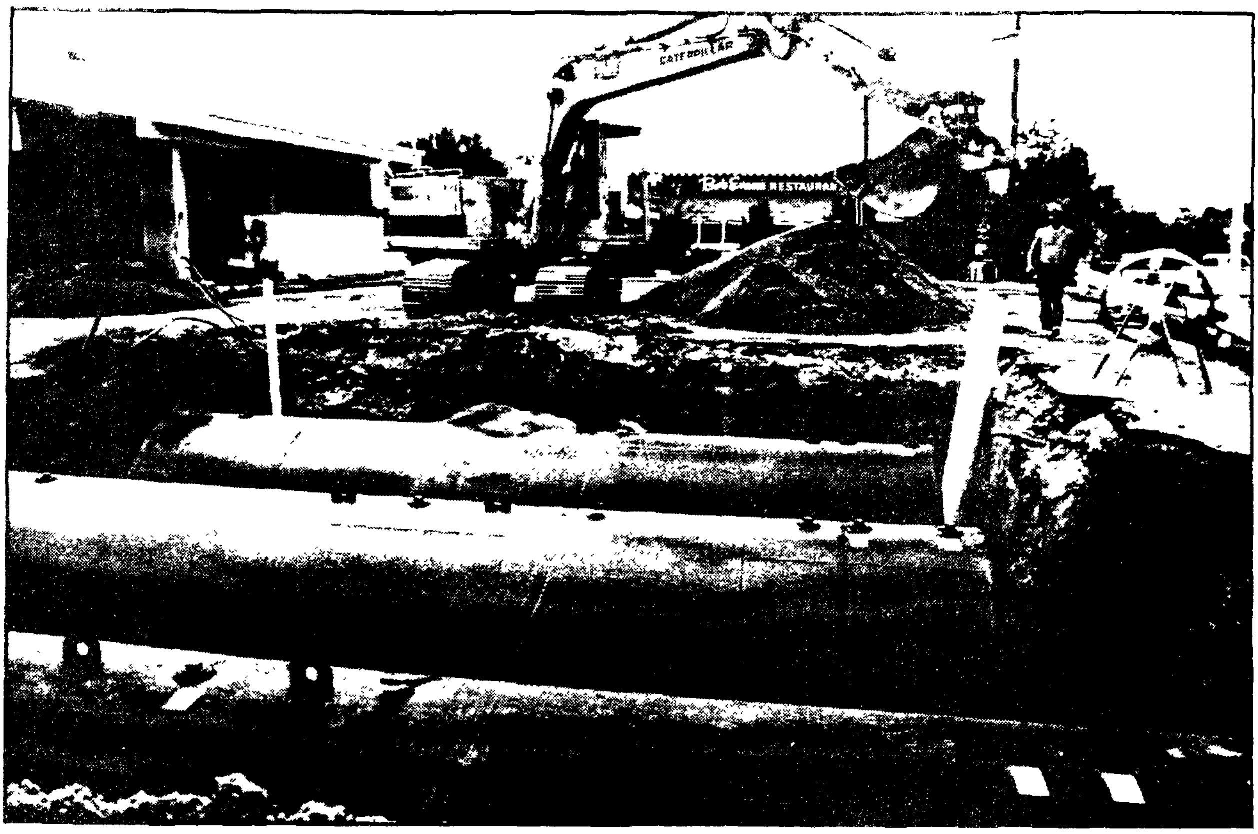
Installing UST Systems The Right Way

First, **install** USTs correctly by using qualified installers who follow industry codes. Faulty installation is a significant cause of UST failures, particularly piping failures. (See pages 33, 37 and 39 for information on correct installation practices and industry codes.) You must also make sure that the contents you store are compatible with the UST system.

Second, you will also need to **certify** on a **notification form** (see page 25) that you have used a qualified installer who can assure you that your UST has been installed correctly.

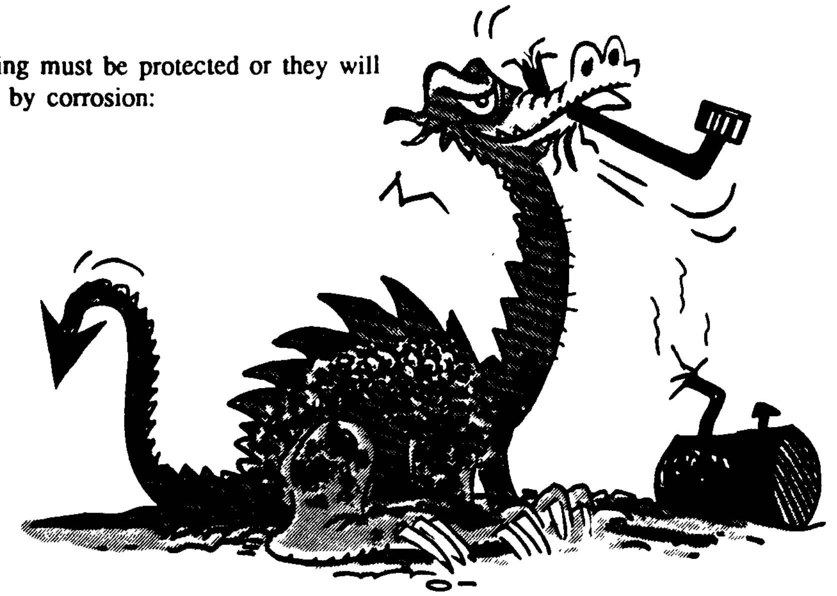
Preventing Spills And Overfills

Because human error causes most spills and overfills, these mistakes can be avoided by following the correct tank filling practices required by the UST regulations. If you and your distributor follow these practices, nearly all spills and overfills can be prevented from happening. Also, the UST regulations require the use of mechanical devices, such as spill catchment basins and overfill alarms, to prevent these releases from harming the environment. (Correct tank filling practices and preventive devices are identified on page 33.)

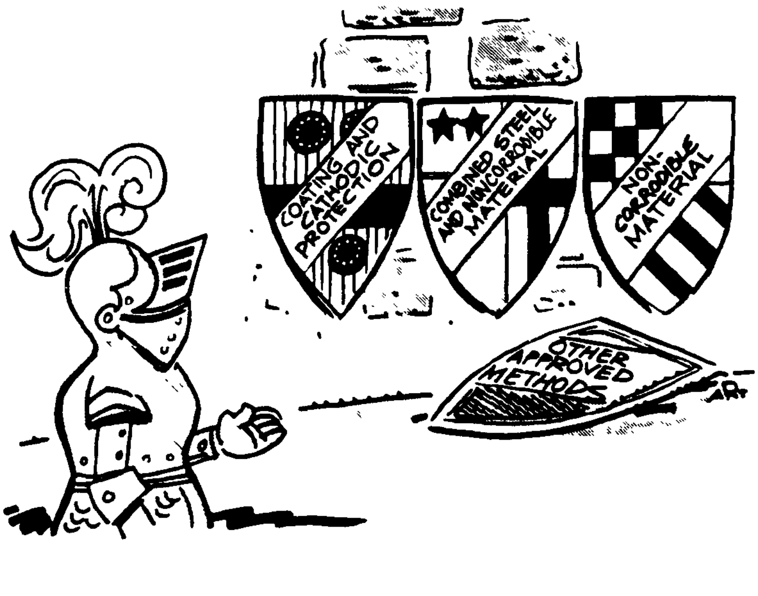


Protecting Tanks And Piping From Corrosion

Tanks and piping must be protected or they will be eaten away by corrosion:



- Steel tanks and piping can be coated with a corrosion-resistant coating and "cathodically" protected. (Cathodic protection uses either sacrificial anodes or impressed current, methods described on page 31.)
- Tanks and piping can be protected by other methods approved by the regulatory authority.
- Tanks and piping can be made totally of a noncorrodible material, such as fiberglass-reinforced plastic. (Metal piping connected to noncorrodible tanks still requires corrosion protection.)
- Steel tanks (but **not** piping) can be protected using a method in which a thick layer of noncorrodible material is bonded to the tank.



Detecting Leaks From Tanks

You must check your tanks at least once a month to see if they are leaking.

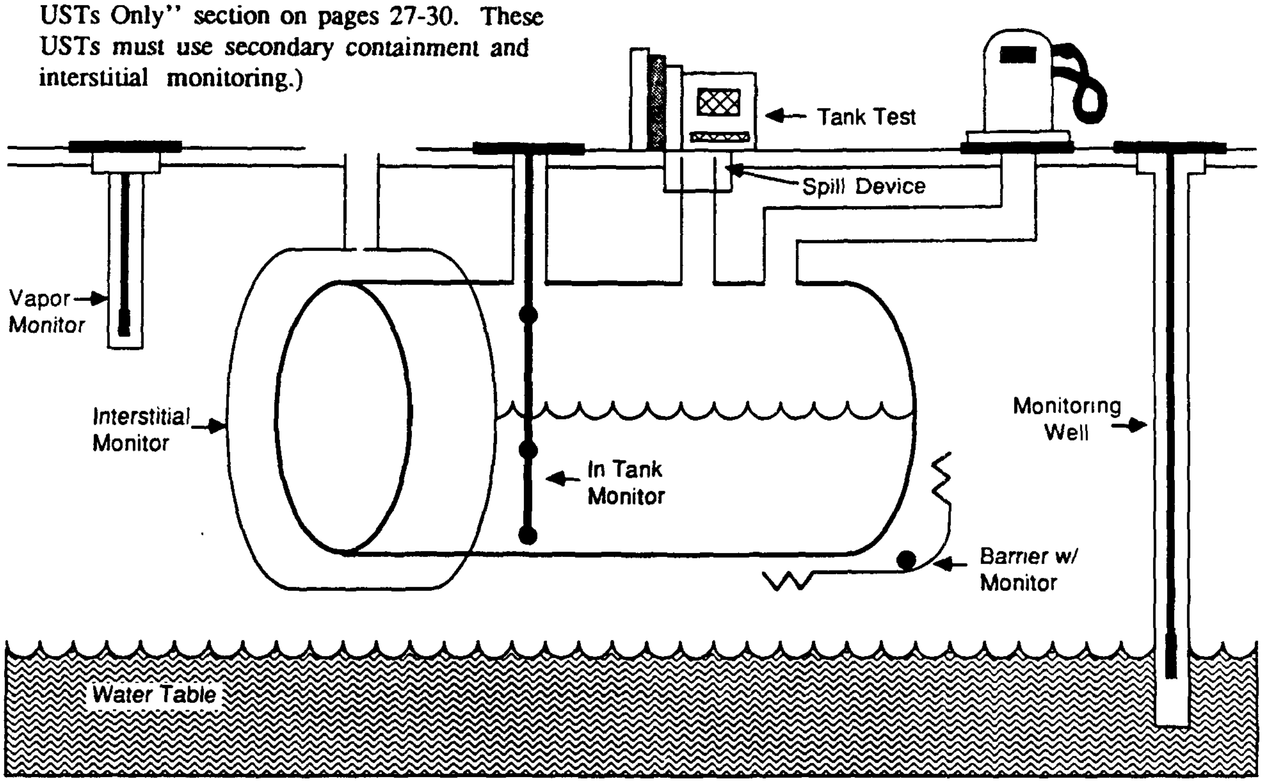
You **must** use one (or a combination) of the following monthly monitoring methods:

- Automatic tank gauging.
- Monitoring for vapors in the soil.
- Interstitial monitoring.
- Monitoring for liquids on the ground water.
- Other approved methods.

Information on these leak detection methods appears in the "Technical Questions & Answers" section on pages 34-35. (Special requirements for USTs containing hazardous chemicals are described in the "For Chemical USTs Only" section on pages 27-30. These USTs must use secondary containment and interstitial monitoring.)

For Young Tanks...
An Alternate Leak Detection Method

You have one additional leak detection choice, but **only for 10 years** after you install your UST. Instead of using one of the monthly monitoring methods noted above, you can check for leaks by combining monthly inventory control with tank tightness testing every 5 years. After 10 years, you must use one of the monthly monitoring methods listed above.



Leak Detection Alternatives

Detecting Leaks From Piping

Because most leaks come from piping, your piping must have leak detection.

If your piping is **pressurized,** you must meet the following requirements:

- The piping must have devices to automatically shut off or restrict flow or have an alarm that indicates a leak.

- You must either conduct an **annual** tightness test of the piping or use one of the following monthly methods noted above for tanks: vapor monitoring, ground-water monitoring, interstitial monitoring, or other approved monthly methods.

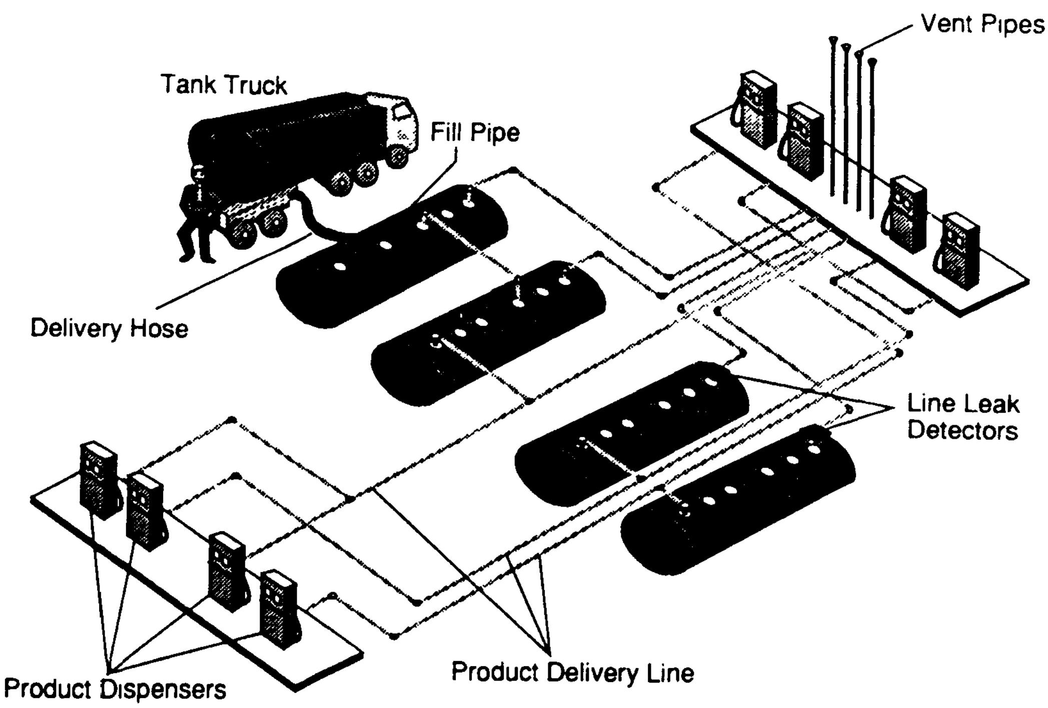
If your UST has **suction** piping, your leak detection requirements will depend on which type of suction piping you have:

- The most commonly used suction piping requires either monthly monitoring (using one of the four monthly methods noted above for use on pressurized piping) or tightness testing of the piping every 3 years.

- Another kind of suction piping is safer and does **not** require leak detection. This safer method has two main characteristics:

  -- Below-grade **piping** is sloped so that the piping's contents will drain back into the storage tank if the suction is released.

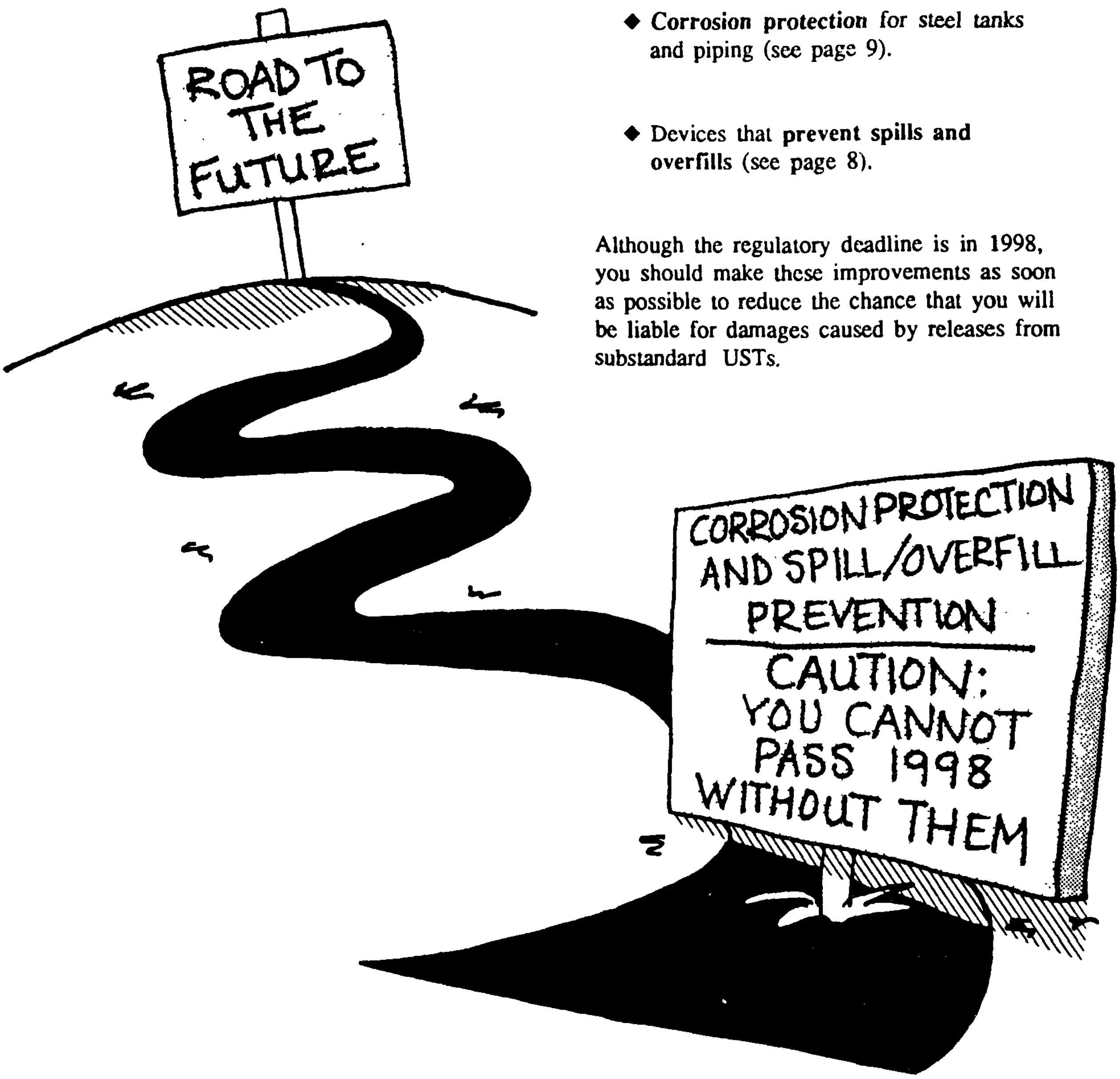
  -- Only one **check valve** is included in each suction line and is located directly below the suction pump.



A Typical Tank Facility

WHAT ABOUT EXISTING PETROLEUM USTs?

Existing UST systems are those installed before December 1988. In addition to immediately starting **tank filling** procedures that will prevent spills and overfills, you will need to meet the following requirements for corrosion protection, spill and overfill prevention, and leak detection. (The chart on pages 16-17 displays these requirements and when you must meet them.)



Deadline For Corrosion Protection And For Devices To Prevent Spills And Overfills

By December 1998 (10 years after the UST regulations become effective), USTs that were installed **before** December 1988 must have:

- **Corrosion protection** for steel tanks and piping (see page 9).
- Devices that **prevent spills and overfills** (see page 8).

Although the regulatory deadline is in 1998, you should make these improvements as soon as possible to reduce the chance that you will be liable for damages caused by releases from substandard USTs.

Deadlines And Choices For Leak Detection

Deadlines...

Leak detection requirements are being phased in for existing USTs depending on their age:

If the tank was installed...	It must have leak detection by December of...
before 1965 or unknown	1989
1965-1969	1990
1970-1974	1991
1975-1979	1992
1980-Dec.1988	1993

This schedule will make sure that the older USTs, which are more likely to leak, have leak detection first.

Choices For Existing Tanks...

You have three basic choices for making sure your tanks are checked at least monthly to see if they are leaking:

- You can use any of the **monthly monitoring methods** listed for new tanks on page 10.

- If your UST has corrosion protection or internal tank lining and devices that prevent spills and overfills, you can **combine monthly inventory control with tank tightness testing every 5 years.** This choice, however, can only be used for 10 years after adding corrosion protection or internally lining the tank (or until December 1998, whichever date is later). After 10 years, you must use one of the monthly monitoring methods on page 10.

- If your UST does not have corrosion protection or internal tank lining and devices that prevent spills and overfills, you can **combine monthly inventory control with *annual* tank tightness testing.** Please note, however, that this method is allowed **only until December 1998.** After that, your UST -- now equipped with corrosion protection or an internal tank lining, and devices that prevent spills and overfills -- must use one of the first two leak detection choices noted above.

Some Choices May Be Better...

You have a leak detection advantage if your UST has been "upgraded" with corrosion protection and devices to prevent spills and overfills. For 10 years after "upgrading," you can use a leak detection method that will be less costly and easier to apply than most other leak detection methods. This method requires you to conduct monthly inventory control and to have tank tightness tests performed every 5 years (see page 14). By contrast, USTs that have **not** been "upgraded" must have tank tightness tests **every year.**

***Choices For Existing* Piping...**

You have two basic choices of leak detection for piping depending on the type of piping you use:

- By **December 1990,** existing **pressurized** piping must meet the leak detection requirements for new **pressurized** piping (see page 11).
- Existing **suction piping** must meet the requirements for new suction piping (see page 11) at the same time the tank meets the leak detection schedule given above.

REMEMBER...

No matter which leak detection methods you use for tanks and piping, they must be working by the deadlines described above. If not, you must close your UST or replace it with a new UST.

The chart on pages 16-17 displays all these leak detection requirements and the ones for corrosion protection and spill and overfill prevention.

WHAT DO YOU HAVE TO DO? Minimum Requirements

You must have Leak Detection, Corrosion Protection, and Spill/Overfill Prevention.
For WHEN you have to add these to your tank system, see the chart on the right. ⟶

LEAK DETECTION	
NEW TANKS *2 Choices*	• Monthly Monitoring* • Monthly Inventory Control and Tank Tightness Testing Every 5 Years (You can only use this choice for 10 years after installation.)
EXISTING TANKS *3 Choices* *The chart at the bottom of the next page displays these choices.*	• Monthly Monitoring* • Monthly Inventory Control and Annual Tank Tightness Testing (This choice can only be used until December 1998.) • Monthly Inventory Control and Tank Tightness Testing Every 5 Years (This choice can only be used for 10 years after adding corrosion protection and spill/overfill prevention or until December 1998, whichever date is later.)
NEW & EXISTING PRESSURIZED PIPING *Choice of one from each set*	• Automatic Flow Restrictor • Automatic Shutoff Device • Continuous Alarm System -and- • Annual Line Testing • Monthly Monitoring* (except automatic tank gauging)
NEW & EXISTING SUCTION PIPING *3 Choices*	• Monthly Monitoring* (except automatic tank gauging) • Line Testing Every 3 Years • No Requirements (if the system has the characteristics described on page 11)
CORROSION PROTECTION	
NEW TANKS *3 Choices*	• Coated and Cathodically Protected Steel • Fiberglass • Steel Tank clad with Fiberglass
EXISTING TANKS *4 Choices*	• Same Options as for New Tanks • Add Cathodic Protection System • Interior Lining • Interior Lining and Cathodic Protection
NEW PIPING *2 Choices*	• Coated and Cathodically Protected Steel • Fiberglass
EXISTING PIPING *2 Choices*	• Same Options as for New Piping • Cathodically Protected Steel
SPILL / OVERFILL PREVENTION	
ALL TANKS	• Catchment Basins -and- • Automatic Shutoff Devices -or- • Overfill Alarms -or- • Ball Float Valves

* Monthly Monitoring includes: Automatic Tank Gauging, Vapor Monitoring, Interstitial Monitoring, Ground-Water Monitoring, Other Approved Methods

WHEN DO YOU HAVE TO ACT? Important Deadlines

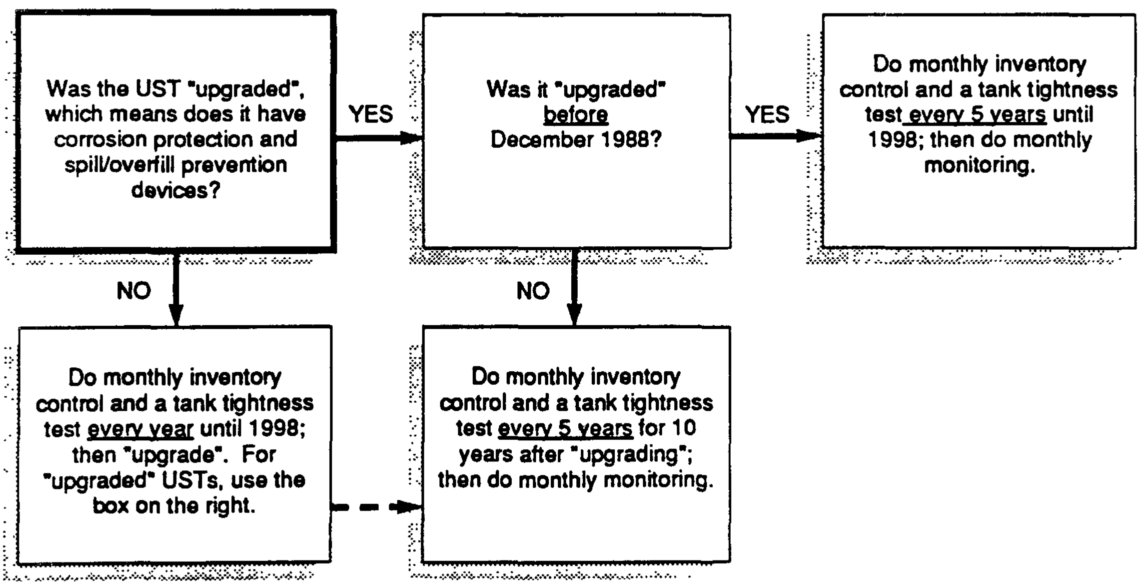
For WHAT you have to do, see the chart on the left.

TYPE OF TANK & PIPING	LEAK DETECTION	CORROSION PROTECTION	SPILL / OVERFILL PREVENTION
New Tanks and Piping*	At installation	At installation	At installation
Existing Tanks** Installed:	By No Later Than:		
Before 1965 or unknown	December 1989	December 1998	December 1998
1965 - 1969	December 1990	December 1998	December 1998
1970 - 1974	December 1991	December 1998	December 1998
1975 - 1979	December 1992	December 1998	December 1998
1980 - December 1988	December 1993	December 1998	December 1998
Existing Piping**			
Pressurized	December 1990	December 1998	Does not apply
Suction	Same as existing tanks	December 1998	Does not apply

* New tanks and piping are those installed after December 1988
** Existing tanks and piping are those installed before December 1988

IF YOU CHOOSE TANK TIGHTNESS TESTING AT EXISTING USTs . . .

If you don't use monthly monitoring at existing USTs, you must use a combination of periodic tank tightness tests and monthly inventory control. This combined method can only be used for a few years, as the chart below displays.



HOW DO YOU CORRECT PROBLEMS CAUSED BY LEAKS?

What Do You Do When You Suspect Your Petroleum UST Is Leaking?

Various warning signals indicate that your UST may be leaking and creating problems for the environment and your business. You can avoid most of these problems by paying careful attention to these warning signals and by taking the appropriate actions.

Warnings From Equipment

You should suspect a leak when you discover the following warning signals from equipment:

- Unusual operating conditions (such as erratic behavior of the dispensing pump).
- Results from leak detection monitoring and testing that indicate a leak.

You need to confirm quickly whether these suspected leaks are real. What at first appears to be a leak may be the result of faulty equipment that is part of your UST system or its leak detection. Double check this equipment carefully for failures. You may simply need to repair or replace equipment that is not working.

If repair or replacement of faulty equipment does not solve the problem, then you must report this finding to the regulatory authority and conduct tightness tests of the entire UST system. If these tests indicate a leak, you need to report to the regulatory authority and follow the actions for a **confirmed** leak (see page 20).

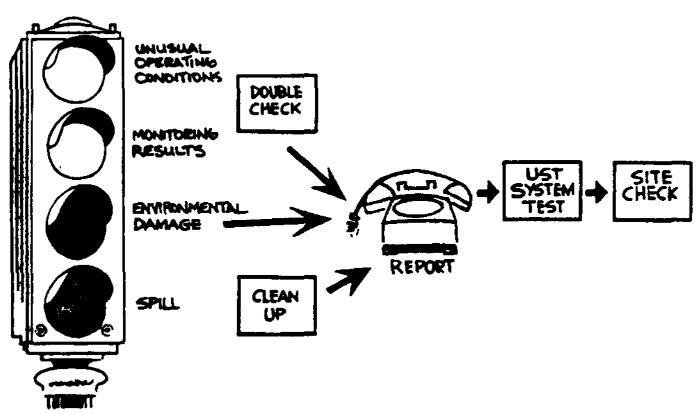
Warnings In The Environment

You should also suspect a leak if evidence of leaked petroleum appears at or near your site. For example, neighbors might tell you they have smelled petroleum vapors in their basements or tasted petroleum in their drinking water. You might even discover evidence of environmental damage as you investigate the suspected equipment failures discussed above.

Whenever evidence of environmental damage is discovered, you must take the following actions:

- Report this discovery **immediately** to the regulatory authority.
- Conduct tightness tests of the entire UST system.
- Investigate the UST site for additional information on the extent and nature of the environmental damage.

The results of these system tests and site checks will help answer the crucial question: "Is my UST leaking?" If the answer is yes, then you will need to follow the actions for responding to **confirmed** leaks (see page 20).



What Do You Do When Your Petroleum UST Leaks?

Your response to **confirmed** leaks and spills (including overfills) comes in two stages: **short-term and long-term.**

Short-Term Actions

- Take immediate action to stop and contain the leak or spill.

- Tell the regulatory authority within 24 hours that there is a leak or spill. However, petroleum spills and overfills of less than 25 gallons do not have to be reported if you immediately contain and clean up these releases.

- Make sure the leak or spill poses no immediate hazard to human health and safety by removing explosive vapors and fire hazards. Your fire department should be able to help or advise you with this task. You must also make sure you handle contaminated soil properly so that it poses no hazard (for example, from vapors or direct contact).

- Find out how far the petroleum has moved and begin to recover the leaked petroleum (such as product floating on the water table).

- Report your progress and any information you have collected to the regulatory authority no later than 20 days after you have confirmed a leak or spill.

- Investigate to determine if the leak has damaged or might damage the environment. You must report to the regulatory authority what you have learned from a full investigation of your site within 45 days of confirming a leak or spill. At the same time, you must also submit a report explaining how you plan to remove the leaked petroleum, if you have found contaminated ground water. Additional site studies may be required if necessary.

These actions are fully explained in the UST regulations and in a brochure (see page 38).

Some leaks and spills will require additional, **long-term** attention to correct the problem.

Long-Term Actions

Based on the information you have provided, the regulatory authority will decide if you must take further action at your site. You may need to take two more actions:

- Develop and submit a Corrective Action Plan that shows how you will meet requirements established for your site by the regulatory authority.

- Make sure you meet the requirements approved by the regulatory authority for your site.

Can Leaking Tanks Be Repaired?

You can repair a leaking tank if the person who does the repair carefully follows standard industry codes that establish the correct way to conduct repairs. (See page 39 for repair codes.)

Within 30 days of the repair, you must prove that the tank repair has worked by doing one of the following:

- Having the tank inspected internally or tightness tested following standard industry codes.
- Using one of the monthly leak detection monitoring methods (except for the method combining inventory control and tank tightness testing).
- Using other methods approved by the regulatory authority.

Within 6 months of repair, USTs with cathodic protection must be tested to show that the cathodic protection is working properly.

You must keep records for each repair as long as you keep the UST in service.

Can Leaking Piping Be Repaired?

Damaged **metal** piping **cannot** be repaired and must be replaced. Loose fittings can simply be tightened, however, if that solves the problem.

Piping made of **fiberglass-reinforced plastic**, however, can be repaired, but **only** in accordance with the manufacturer's instructions or national codes of practice. Within 30 days of the repair, piping must be tested in the same ways noted above for testing tank repairs (except for internal inspection).

HOW DO YOU CLOSE USTs?

You can close your UST **permanently or temporarily.**

Closing Permanently

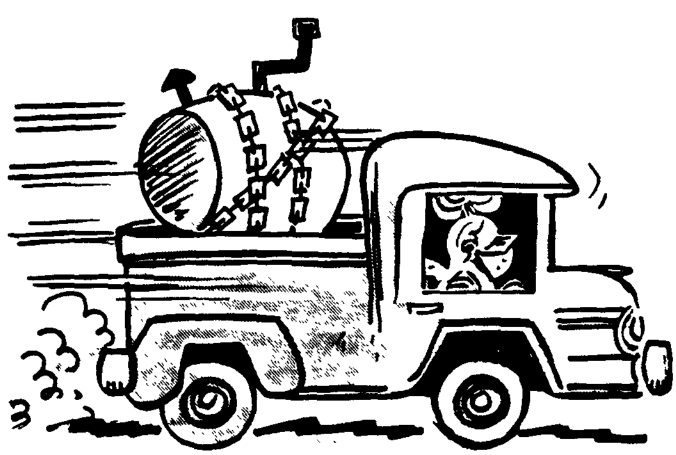
If your tank is not protected from corrosion and it remains closed for **more than 12 months** or you decide to close it permanently, you must follow requirements for **permanent closure**:

- You must notify the regulatory authority 30 days before you close your UST.
- You must determine if leaks from your tank have damaged the surrounding environment. If there is damage, then you will have to take the corrective actions described on page 20.
- You can either remove the UST from the ground or leave it in the ground. In both cases, the tank must be emptied and cleaned by removing all liquids, dangerous vapor levels, and accumulated sludge. These potentially very hazardous actions need to be carried out carefully by following standard safety practices. (See pages 37 and 39 for sources of information on good closure practices.) If you leave the UST in the ground, you must also fill it with a harmless, chemically inactive solid, like sand. The regulatory authority will help you decide how best to close your UST so that it meets all local requirements for closure.

Three Exceptions To Permanent Closure

The requirements for permanent closure may not apply to your UST if it meets one of the following conditions:

- If your UST meets the requirements for a new or upgraded UST, then it can remain "temporarily" closed indefinitely as long as it meets the requirements below for a temporarily closed UST.
- The regulatory authority can grant an extension beyond the 12-month limit on temporary closure for USTs unprotected from corrosion.
- You can change the contents of your UST to an unregulated substance, such as water. Before you make this change, you must notify the regulatory authority, clean and empty the UST, and determine if any damage to the environment was caused while the UST held regulated substances. If there is damage, then you must take the corrective actions described on page 20.



Closing Temporarily

Tanks not used for 3 to 12 months must follow requirements for **temporary closure**:

- If your UST has corrosion protection and leak detection, you must continue to operate these protective systems. If a leak is found, you will have to respond just as you would for a leak from an active UST, as described on page 20. (If your UST is empty, however, you do not need to maintain leak detection.)
- You must cap all lines, except the vent-line, attached to your UST.

WHAT ABOUT REPORTING AND RECORDKEEPING?

What Do You Need To Report?

In general, you will only need to report to the regulatory authority at the beginning and end of your UST system's operating life:

- When you install an UST, you have to fill out a **notification form** available from your State. This form provides information about your UST, including a certification of correct installation. (You should have already used this form to identify your existing USTs. If you haven't done that yet, be sure you do so now.)

- You must report suspected releases to the regulatory authority (see page 19).

- You must report confirmed releases to your regulatory authority. You must also report follow-up actions you plan or have taken to correct the damage caused by your UST (see page 20).

- You must notify the regulatory authority 30 days before you permanently close your UST (see page 23).

You need to check with your regulatory authority about the particular reporting requirements in your area, including any additional or more stringent requirements than those noted above.

What Records Must You Keep?

You will have to keep records that can be provided to an inspector during an on-site visit that prove your facility meets certain requirements. These records must be kept long enough to show your facility's recent compliance status in four major areas:

- You will have to keep records of **leak detection** performance and upkeep:
  - -- The last year's monitoring results, and the most recent tightness test.
  - -- Copies of performance claims provided by leak detection manufacturers.
  - -- Records of recent maintenance, repair, and calibration of leak detection equipment installed on-site.
- You will have to keep records showing that the last two inspections of your **corrosion protection** system were carried out by properly trained professionals.
- You must keep records showing that a **repaired or upgraded UST system** was properly repaired or upgraded.
- For at least 3 years after **closing an UST**, you must keep records of the site assessment results required for permanent closure. (These results show what impact your UST has had on the surrounding area.)

You should check with your regulatory authority about the particular recordkeeping requirements in your area. Generally, you should follow this useful rule of thumb for recordkeeping: When in doubt, keep it.

FOR CHEMICAL USTs ONLY

What Chemicals Are Included In The UST Regulations?

Several hundred chemicals were designated as "hazardous" in Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, better known as CERCLA or "Superfund."

The UST regulations apply to the same hazardous chemicals identified by CERCLA, except for those listed as hazardous wastes. These hazardous wastes are already regulated under Subtitle C of the Resource Conservation and Recovery Act and are **not** covered by the UST regulations. (See 40 CFR Parts 260-270 for the hazardous waste regulations.)

Information on the CERCLA hazardous chemicals is available from EPA through the RCRA/CERCLA Hotline at 1-(800)-424-9346 or (202) 382-3000.

The following pages describe requirements for USTs that contain hazardous chemicals -- more simply referred to as **chemical USTs.**

REMEMBER...

New UST systems are those that are installed after December 1988.

Those USTs installed between May 1985 and December 1988 must meet two minimum requirements:

- The UST must prevent releases due to corrosion or structural failure.
- The stored contents must be compatible with the tank's interior wall.

After December 1988, these older USTs must meet the requirements for existing chemical USTs (see page 29).

HAZARDOUS SUBSTANCE LIST
(Partial Listing Only)

HAZARDOUS SUBSTANCE	CASRN*
Acenaphthene	83329
Acenaphthylene	208968
Acetaldehyde	75070
Acetaldehyde, chloro-	107200
Acetaldehyde, tricloro-	75876
Chromic sulfate	10101538
Choromium	7440473
CHROMIUM AND COMPOUNDS	--
Chromous chloride	10049055
Chrysene	218019
Cobaltous bromide	7789437
Cobaltous formate	544183
Cobaltous sulfamate	14017415
Copper	7440508
Copper cyanide	544923
Famphur	52857
Ferric ammonium citrate	1185575
Ferric ammonium oxalate	2944674
Ferric chloride	7705080
Ferric dextran	9004664
Ferric fluoride	7783508
Ferric nitrate	10421484
Ferric sulfate	10028225
Keithane	115322
Kepone	143500
Lasiocarpine	303344
LEAD AND COMPOUNDS	--
Lead	7439921
Lead acetate	301042
Lead arsenate	7784409
Lead chloride	7758954
Lead fluoborate	13814965
Lead iodide	10101630
Zinc nitrate	7779886
Zinc phenosulfonate	127882
Zinc phosphide	1314847
Zinc silicoflouride	16871719
Zinc sulfate	7733020
Zirconium nitrate	13746899
Zirconium sulfate	14644612
Zirconium tetrachloride	10026116

*Chemical Abstracts Service Registry Number

What Requirements Apply To New Chemical USTs?

New chemical USTs have to meet the same requirements described earlier for new petroleum USTs concerning correct installation, corrosion protection, spill and overfill prevention, corrective action, and closure.

However, they must have secondary containment and interstitial monitoring as described below.

Secondary Containment

All new chemical USTs must have "secondary containment." A single-walled tank is the first or "primary" containment. Using only primary containment, a leak can escape into the environment. But by enclosing an UST within a second wall, leaks can be contained and detected quickly before harming the environment.

There are several ways to construct secondary containment:

- ◆ Placing one tank inside another tank or one pipe inside another pipe (making them double-walled systems).
- ◆ Placing the UST system inside a concrete vault.
- ◆ Lining the excavation zone around the UST system with a liner that cannot be penetrated by the chemical.

Interstitial Monitoring

The chemical UST must have a leak detection system that can indicate the presence of a leak in the confined space between the first and the second wall. Several devices are available to monitor this confined "interstitial" space. ("Interstitial" simply means "between the walls.") The UST regulations describe these various methods and the requirements for their proper use.

You can apply for an exception, called a **variance**, from the requirement for secondary containment and interstitial monitoring. Getting a variance will require a lot of work. You will have to convince your regulatory authority that your alternative leak detection method will work effectively by providing detailed studies of your site, proposed leak detection method, and available methods for corrective action. Also, some States may not allow variances.

What About Existing Chemical USTs?

Existing UST systems are those installed before December 1988. In addition to immediately starting tank filling procedures that prevent spills and overfills, you will need to meet the following requirements for existing USTs.

Protection From Corrosion And Prevention Of Spills And Overfills

By December 1998 (10 years after the UST regulations become effective), you must improve your USTs installed **before** December 1988:

- By adding **corrosion protection** to steel tanks and piping.
- By using devices that **prevent spills and overfills.**

Although the regulatory deadline is in 1998, you should make these improvements as soon as you can to reduce the chance that you will be liable for damages caused by your substandard UST.

Leak Detection

Leak detection requirements are being phased in for existing USTs depending on their age:

If the tank was installed...	It must have leak detection by December of...
before 1965 or unknown	1989
1965-1969	1990
1970-1974	1991
1975-1979	1992
1980-Dec.1988	1993

This schedule will make sure that the older USTs, which are more likely to leak, have leak detection first.

There is a special deadline for **pressurized** piping in **December 1990.** At that time, **existing** pressurized piping must meet the requirements for **new** pressurized piping (described on page 11).

Choosing Leak Detection Methods For Existing Chemical USTs

You can meet the leak detection requirements in one of the following three ways:

- After December 1998, your UST must meet the same requirements for secondary containment and interstitial monitoring that apply to new chemical USTs.
- After December 1988, a **variance** can be granted if you meet the same requirements described above for getting a variance for a new chemical UST.
- **Until December 1998,** you can use any of the leak detection methods, other than interstitial monitoring, described on page 14 **but only if** the method you choose can effectively detect releases of the hazardous chemical stored in the UST. (Variances are not required in these cases before December 1998.)

  After December 1998, you must either use secondary containment and interstitial monitoring or get a variance.

> NOTE..
>
> No matter which leak detection methods you use for tanks and piping, they must be working by the deadlines described above. If not, you must close your UST or replace it with a new UST.

What Do You Do If You Have A Hazardous Chemical Leak Or Spill?

You must follow the same short-term and long-term actions described earlier for petroleum leaks and spills -- except for two modified short-term actions.

First, you must immediately report hazardous chemical spills or overfills that meet or exceed their "reportable quantities" to the National Response Center at 1-(800)-424-8802 or (202) 267-2675.

Second, you must also report hazardous chemical spills or overfills that meet or exceed their "reportable quantities" to the regulatory authority within 24 hours. However, if these spills or overfills are smaller than their "reportable quantities" and are immediately contained and cleaned up, they do not need to be reported.

You can get information on the "reportable quantities" by calling the RCRA/CERCLA Hotline 1-(800)-424-9346 or (202) 382-3000.

TECHNICAL QUESTIONS & ANSWERS

Q. How does "corrosion" cause USTs to leak? How can USTs be protected from corrosion?

A. Unprotected steel USTs are frequently damaged by corrosion. When this happens, the metal UST system and its underground surroundings act like a battery. Part of the UST can become negatively charged and another part positively charged. Moisture in the soil provides the connecting link that finally turns these UST "batteries" on. Then, the negatively charged part of the UST system -- where the current exits from the tank or its piping -- begins to deteriorate. As electric current passes through this part, the hard metal begins to turn into soft ore, holes form, and leaks begin.

Steel tanks and piping can be protected by coating them with a corrosion-resistant coating and by using "cathodic" protection. Cathodic protection reverses the electric current that causes corrosion and comes in two forms:

- "Sacrificial anodes" can be attached to the UST. Sacrificial anodes are pieces of metal more electrically active than the steel UST. Because these anodes are more active, the electric current will exit from them rather than the UST. Thus, the UST is the "cathode" and is protected from corrosion while the attached "anode" is sacrificed.

- An "impressed current" protection system introduces an electric current into the ground through a series of anodes that are **not** attached to the UST. Because the electric current flowing from these anodes to the tank system is greater than the corrosive current attempting to flow from it, the UST is protected from corrosion.

In addition, steel USTs can also be protected from corrosion if they are bonded to a thick layer of noncorrodible material, such as fiberglass-reinforced plastic. Cathodic protection is not needed with this method of corrosion protection. Also, the corrosion problem can be totally avoided by using tanks and piping made completely of noncorrodible material, such as fiberglass.

For more information on how corrosion works and how USTs can be protected from corrosion, contact the National Association of Corrosion Engineers or other corrosion professionals. See page 39 for industry codes on corrosion protection.

Q. How can existing USTs (those installed before December 1988) be "upgraded" to meet the corrosion protection requirements by December 1998?

A. When you add corrosion protection to existing UST systems, you have several choices. Your first choice is to meet the corrosion protection requirements for new tanks and piping (see page 9). Your other choices, described below, depend on whether you are protecting the tank or the piping.

Protecting Tanks

You have three choices for "upgrading" your tank for corrosion protection:

- The interior of a tank can be lined according to industry codes (see page 39 for codes). Tanks using only an interior lining for corrosion protection must pass an inspection in 10 years and reinspections every 5 years after that to ensure that the lining and tank are structurally sound.

- Tanks using only cathodic protection must meet the general requirements for cathodic protection and satisfy one of the methods below to make sure that the tank is structurally sound:

  -- If the tank is **less than 10 years old**, you can use one of the monthly leak detection monitoring methods noted on page 10.

  -- If the tank is **less than 10 years old**, you can have two tank tightness tests conducted. The first test must take place before you install cathodic protection, and the second test must take place between 3 and 6 months later.

  -- If the tank is **10 years old or more**, it must be internally inspected and assessed to make sure that the tank is structurally sound and free of corrosion holes before a cathodic protection system is installed.

- You can combine tank interior lining with cathodic protection. If you use this combined method, you are not required to have the interior lining periodically inspected.

Protecting Piping

Unless the existing piping is made of noncorrodible material, it must meet the requirements for cathodic protection of new metal piping, <u>except</u> that the existing piping does not need to be coated with a corrosion-resistant coating (see page 9).

Q. What are "installation mistakes" and how can they be avoided?

A. Improper installation is a significant cause of fiberglass-reinforced plastic (FRP) and steel UST failures, particularly piping failures. Proper installation is crucial to ensure the structural integrity of both the tank and its piping. Installation includes excavation, tank system siting, burial depth, tank system assembly, backfilling of the tank system, and surface grading. Many mistakes can be made during installation. For example, mishandling of the tank during installation can cause structural failure of FRP tanks or damage to steel tank coatings and cathodic protection. Improper layout of piping runs, incomplete tightening of joints, inadequate cover pad construction, and construction accidents can lead to failure of delivery piping.

Installation problems result from careless installation practices that do not follow recognized industry codes and procedures. If owners and operators make sure that their installers carefully follow the correct installation procedures called for by industry codes, the number of installation mistakes will be significantly reduced. See page 39 for industry codes on installation. See page 37 for sources of information on installation.

Q. What are spills and overfills? How can they be stopped?

A. Many of the leaks at UST systems are actually the result of spills and overfills (which are two separate problems). In fact, these releases are at least twice as numerous as tank or piping releases. Spills most often occur at the fill pipe opening when the delivery truck's hose is disconnected, usually releasing only a few gallons. Repeated releases of even small volumes, however, can create real environmental problems. Overfills occur less frequently but usually release much larger volumes. When a tank is overfilled, large volumes can be released through untight fittings on the top of the tank or the vent pipe. The tightness of these fittings normally would not be a problem as long as the tank was not filled beyond its capacity.

There are three keys to solving the problems of spills and overfills. **First,** you must make sure that the volume available in the tank is greater than the volume of product to be transferred to the tank <u>before</u> the transfer is made.

Second, you have to make sure that the transfer operation is watched constantly to prevent overfilling and spilling. See page 39 for appropriate industry codes.

Third, you must use equipment that can prevent or severely limit spills and overfills (see below for <u>when</u> you have to do this). Spill prevention devices, such as spill catchment basins or dry disconnect couplings, are readily available. Overfill prevention devices automatically shut off flow when the tank is nearly full. Other overfill devices either restrict flow or trigger an alarm when the tank is nearly full.

Your new UST system must be equipped with both spill <u>and</u> overfill prevention devices when it is installed. Your existing USTs must have these devices by December 1998. The only exception to this requirement is if your UST system is filled only by separate transfers of no more than 25 gallons. In these cases, you do not have to follow the spill and overfill equipment requirements.

Q. What leak detection methods will satisfy the leak detection requirements for new or "upgraded" petroleum USTs?

A. You must provide your UST system with a method, or combination of methods, of leak detection that allows you to meet the following three basic requirements:

- You can detect a leak from any portion of the tank or its piping that **routinely** contains petroleum;
- Your leak detection equipment is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions; and
- Your leak detection equipment meets the performance requirements described in the Federal regulations, sections 280.43 or 280.44.

EPA is developing brochures that fully describe the various ways you can meet the leak detection requirements (see page 38). Leak detection methods are presented in the Preamble to the UST regulations (Section IV.D.) and in the rule (Subpart D, Sections 280.43 and 280.44). The descriptions below briefly identify leak detection methods for tanks and piping.

Leak Detection for Tanks

Leak detection for tanks can consist of one or a combination of the following methods:

Tank Tightness Testing Combined with Inventory Control

This method combines manual inventory control information (measured daily and compiled monthly) with tank tightness testing every 5 years. Tank tightness testing requires taking the UST out of service while changes in level or volume over time are measured. This method can be used only by new or upgraded USTs during their first 10 years of operation (or until 1998, whichever is later). After that, one of the monthly monitoring methods below must be used.

Automatic Tank Gauging Systems

This method uses automated processes to monitor product level and inventory control.

Monitoring for Vapors in the Soil

This method samples vapors in the soil gas surrounding the UST. Leaked petroleum produces vapors that can be detected in the soil gas. The regulations describe several requirements for using this leak detection method. For example, this method requires using porous soils in the backfill and locating the monitoring devices in these porous soils near the UST system.

Monitoring for Liquids on the Ground Water

This method monitors the ground water table near an UST for the presence of released free product on the water table. Monitoring wells near the UST are checked frequently to see if petroleum can be detected. The regulations allow manual and automatic methods for detecting petroleum in the monitoring wells. The regulations also describe several requirements for the use of this method. For example, this method cannot be used if the water table is more than 20 feet below the surface of the ground.

Interstitial Monitoring

This method detects leaks in the space between the UST and a second barrier or wall. The regulations describe several general performance requirements for the application of interstitial monitoring with double-walled USTs, USTs fitted with internal liners, and USTs using partial interception barriers located below the UST.

Other Methods Approved by the Regulatory Authority

If other methods can be shown to work as effectively as the methods described above for leak detection, then these alternative methods can be approved by the regulatory authority.

One Additional Method with Restricted Use

Manual tank gauging can be used as the sole method of leak detection, but only with tanks that are 550 gallons or less. This method involves taking two stick measurements at least 36 hours apart when the tank is not open for use. Also, manual tank gauging can be used in place of manual inventory control in tanks ranging in size from 551 to 2,000 gallons. In these cases, however, manual tank gauging must be combined with tank tightness testing.

Leak Detection for Piping

If you have **pressurized** piping, you need to do two things:

- Install an automatic line leak detector, and

- **Either** conduct an annual line tightness test,

  Or conduct monthly leak detection monitoring using one of the following methods noted above for tanks: vapor monitoring, ground-water monitoring, interstitial monitoring, or other approved monthly methods.

If you have **suction** piping, you need to do one of two things:

- **Either** conduct line tightness tests every 3 years,

  Or conduct monthly leak detection monitoring as described above for pressurized piping.

You do **not** need to have leak detection if your **suction piping** meets some basic design requirements:

- Below-grade **piping** is sloped so that the piping's contents will drain back into the storage tank if the suction is released.

- Only one **check valve** is included in each suction line and is located directly below the suction pump.

VIDEOS, BROCHURES, AND HANDBOOKS ON USTs

Videos

Installation

"A Question of When: Tank Installation for Inspectors" "In Your Own Backyard"	Available for purchase only, $22.85 each, pre-paid. Order from: National Fire Protection Association Attn: Jim Smalley Batterymarch Park Quincy, MA 02269

"Doing It Right" (coming soon)	For information: U.S. Environmental Protection Agency Office of Underground Storage Tanks P.O. Box 6044 Rockville, MD 20850

Closure

"Tank Closure Without Tears: An Inspector's Safety Guide"	Video and companion booklet available for purchase, $25.00, prepaid. Booklet only, $5.00, prepaid. Order from: New England Interstate Water Pollution Control Commision Attn: VIDEOS 85 Merrimac Street Boston, MA 02114 Video and companion booklet available for loan, $5.00, prepaid. Order from: New England Regional Wastewater Institute Two Fort Road South Portland, ME 04106

Brochures

Corrective Action "Oh No!" -- Leaks and Spills: What Do You Do? (coming soon) ***Leak Detection*** "Leak Lookout" -- Using External Leak Detectors to Prevent Petroleum Contamination from Underground Storage Tanks ***Financial Responsibility*** Financial Responsibility Requirements Summary (coming soon)	These brochures may be ordered from: U.S. Environmental Protection Agency Office of Underground Storage Tanks P.O. Box 6044 Rockville, MD 20850

Handbooks

"Financial Assurance Programs: A Handbook for States" (coming soon) "Funding Options for State and Local Governments" "Underground Storage Tanks: Building State UST Compliance Programs"	These handbooks may be ordered from: U.S. Environmental Protection Agency Office of Underground Storage Tanks P.O. Box 6044 Rockville, MD 20850

"Cleanup of Releases from Petroleum USTs: Selected Technologies"	Stock No. 055-000-00272-0, $7.50 prepaid. This handbook may be ordered from: Superintendent of Documents Government Printing Office Washington, D.C. 20402

INDUSTRY CODES AND STANDARDS*

Installation

API Publication 1615, 1987, "Installation of Underground Petroleum Storage Systems," Recommended Practice, 4th Edition

PEI RP-100-87, 1987, "Recommended Practices for Installation of Underground Liquid Storage Systems"

Tank Filling Practices

API Publication 1621, 1977, "Recommended Practice for Bulk Liquid Stock Control at Retail Outlets," 3rd Edition (A revised edition is now available.)

NFPA 385, 1985, "Standard for Tank Vehicles for Flammable and Combustible Liquids"

Closure

API Bulletin 1604, 1987, "Removal and Disposal of Used Underground Petroleum Storage Tanks," Recommended Practice, 2nd Edition

Lining

API Publication 1631, 1987, "Interior Lining of Underground Storage Tanks," Recommended Practice, 2nd Edition

NLPA Standard 631, 19--, "Spill Prevention: Minimum 10 Year Life Extension of Existing Steel Underground Storage Tanks by Lining Without the Addition of Cathodic Protection"(DRAFT)

*This list includes the most relevant codes and standards for underground storage tank systems. Organizations are identified on page 40.

Corrosion Protection

API Publication 1632, 1987, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems," Recommended Practice, 2nd Edition

NACE RP-0169-83, 1983, "Recommended Practice: Control of Corrosion on Underground or Submerged Metallic Piping Systems"

NACE RP-0285-85, 1985, "Recommended Practice: Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems"

General (Repair, Spill and Overfill, Installation, Compatibility)

API Publication 1626, 1985, "Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations," 1st Edition

API Publication 1627, 1986, "Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations"

API Recommended Practice 1635, 1987, "Management of Underground Petroleum Storage Systems at Marketing and Distribution Facilities," Recommended Practice, 3rd Edition

NFPA 30, 1987, "Flammable and Combustible Liquids Code"

NFPA 30A, 1987, "Automotive and Marine Service Station Code"

ORGANIZATIONS TO CONTACT FOR TANK INFORMATION

ACT -- Association for Composite Tanks
108 North State Street
Suite 720
Chicago, IL 60602
(301) 355-1307 (for information requests)

API -- American Petroleum Institute
1220 L Street, N.W.
Washington, DC 20005
(202) 682-8000

Fiberglass Petroleum Tank and
Pipe Institute
One SeaGate, Suite 1001
Toledo, OH 43604
(419) 247-5412

NACE -- National Association of Corrosion
Engineers
Box 218340
Houston, TX 77218
(713) 492-0535

NFPA -- National Fire Protection Association
Batterymarch Park
Quincy, MA 02269
(617) 770-3000

NLPA -- National Leak Prevention Association
P.O. Box 29809
Cincinnati, OH 45229
(513) 281-7693
1-(800)-543-1838

PEI -- Petroleum Equipment Institute
Box 2380
Tulsa, OK 74101
(918) 743-9941

Steel Tank Institute
P.O. Box 4020
Northbrook, IL 60065
(312) 498-1980

14.1 WORKSHOP G: CLEAN AIR ACT REQUIREMENTS FOR PROPER NOTIFICATION AND REMOVAL OF ASBESTOS FROM BUILDINGS

14.1 WORKSHOP G: CLEAN AIR ACT REQUIREMENTS FOR PROPER NOTIFICATION AND REMOVAL OF ASBESTOS FROM BUILDINGS

Pauline G. Levin, Chief, Asbestos Management Section, EPA-Region III.

Ms. Levin presented key events that have been incremental in the development of EPA's asbestos program. These events are outlined in the attached chronology.

Federal regulatory requirements for asbestos are authorized under TSCA and the Clean Air Act. It is recommended that commercial or institutional building owners have an asbestos operations and maintenance program that includes identification of asbestos, description of work practices, surveillance and record keeping including medical and respiratory programs for the workers.

EPA ASBESTOS PROGRAM CHRONOLOGY

1972 List asbestos as a hazardous air pollutant.

1973 Set standard of "no visible emissions" for the milling of asbestos, the manufacturing of asbestos products, and the demolition of buildings. Prohibited the spray application for most uses of friable materials containing more than one percent of asbestos.

1974 Issued water effluent guidelines for asbestos manufacturing point sources and new source performance standards.

1975 Extended the "no visible emissions" standard to waste collection and disposal.

1978 Prohibited most friable, sprayed-on asbestos.

1979 Initiated a technical assistance program to help schools identify and control friable asbestos-containing materials. Announced Agency's intention to consider regulating commercial uses of asbestos.

1980 Listed asbestos as a hazardous waste in proposed rules. Proposed rule for schools to identify and notify EPA of any friable asbestos in schools. Proposed a rule under TSCA requiring the reporting of production and exposure data on asbestos.

1982 Issued final rule on the identification and notification of friable asbestos-containing materials in schools. Also, issued final rule under TSCA requiring the reporting of production and exposure data on asbestos.

1984 Conducted national survey of public buildings to determine the extent of asbestos-containing materials.

1985 Made first distribution of annual ASHAA loans and grants to financially needy schools.

1986 Proposed the ban and phase-out of most asbestos products and the uses of asbestos. Distributed second round of ASHAA funds to schools. Began developing a regulation to carry out the newly enacted Asbestos Hazard Emergency Response Act (AHERA). EPA used the "regulation negotiation" process, which calls for including all interested and affected constituencies in the actual development of the regulation.

1987 Proposed and subsequently finalized regulations for AHERA implementation which were distributed to public and private schools. Distributed third round of ASHAA funds to schools. Developed and finalized Model Accreditation Plan.

1988 Distributed grants totaling $15 million to states for AHERA inspections and management plans. Distributed fourth round of ASHAA funds to schools. Submitted report to Congress on asbestos in public and commercial buildings, which proposed a three-year program of increased guidance, technical assistance, and enforcement of current regulations. Provided training to AHERA state designees and EPA's Regional Asbestos Coordinators on proper AHERA implementation. Appointed an Asbestos Ombudsman at EPA headquarters to respond to citizen concerns, questions, and complaints about asbestos-in-schools issues. Provided schools with AHERA implementation support in the form of guidance materials, a nationwide teleconference, and technical assistance. Approved over 400 training courses for accreditation f asbestos consultants.

1989 Distributed fifth round of ASHAA funds to schools. Continued inspections under AHERA in schools. Continued accreditation of training courses. Issued Ban and Phasedown Rule for manufacture, importation, processing, and distribution in commerce. Held dialogue on Public and Commercial buildings. Developed coordination of AHERA and NESHAP. Stated approval of state programs to take over accreditation of courses.

1990 Reauthorization of Asbestos School Hazard Abatement Act (ASHAA). First phase of Ban and Phasedown Rule went into effect. Continued inspections under AHERA in schools.

15.1 KEYNOTE ADDRESS - IS TOTAL COMPLIANCE ACHIEVABLE?

15.1 KEYNOTE ADDRESS - IS TOTAL COMPLIANCE ACHIEVABLE?

Christian R. Holmes, Deputy Assistant Administrator for Federal Facilities, Office of Enforcement, EPA, Headquarters.

Mr. Holmes presented a keynote address focusing on the environmental challenge at federal facilities. He discussed his observations concerning environmental problems at federal facilities and difficulties encountered in addressing these problems. He stressed the importance of identifying key problem areas and securing resources to correct the problems. According to Mr. Holmes, his observations indicate that environmental problems at federal levels are getting worse.

There are 1200 facilities on the National Priorities List (NPL). Approximately 115 of these facilities are federal facilities. Mr. Holmes sees a series of waves crashing down on federal facilities in the future, resulting in increased NPL listings and a greatly increased workload. Under RCRA, 250 federal facilities are Transport, Storage and Disposal Facilities (TSD). Eighty percent of these will require corrective action resulting in a further increase in workload. Huge management challenges, exceeding even those of the private sector will develop. Lastly, interagency agreements and feasibility studies must be developed. In summary, there will be a phenomenal increase in federal facility workload.

The largest problem in dealing with the increased workload as Mr. Holmes stated, will be a shortage of staff to oversee cleanup activities. Whether the agency will be able to carry out its responsibility will depend on supplemental appropriation and reprogramming. With a workforce turnover rate of 20 to 50 percent annually, there is also a need to consolidate training.

According to Holmes, it is necessary to identify key problem areas at federal facilities and the specific threats to the environment. There is a need to identify short term problems and then secure resources to fix the problems.

Tools and approaches at the disposal of federal facilities to accomplish these objectives are as follows;

1) Agreements on compliance, violation, and enforcement.
2) Systematic approach to cleanup technologies.
3) Communication: Need to start communicating to others what methods are successful.

16.1 THE NEW OFFICE OF FEDERAL FACILITY ENFORCEMENT ORGANIZATION AND GOALS

16.1 THE NEW OFFICE OF FEDERAL FACILITY ENFORCEMENT ORGANIZATION AND GOALS

Gordon Davidson, Director Office of Federal Facilities Enforcement EPA, Headquarters.

Mr. Davidson discussed EPA's philosophy on compliance and clean-up and the intended goals and anticipated regulations of the Office of Federal Facility Enforcement. Mr. Davidson stressed that enforcement is not one of the goals but a tool to achieve a commitment of environmental compliance. It is EPA's goal to establish memorandums of agreements (MOAs) as a step towards achieving environmental compliance at federal facilities. It is necessary to have agreements that are enforceable in court.

The MOAs should clarify roles and responsibilities of the parties. They should include a schedule that defines who does what and when. An action plan that reflects relative priority of problems should be clearly defined. The MOAs allow EPA to prioritize problems. EPA plans to continue, as a policy, to focus on these agreements.

The goal on the clean-up side is to expedite response actions. The primary objective in clean-up operations is to contain waste so it can be disposed of properly.

Mix waste management problems were also addressed. EPA hopes to achieve the following with their compliance strategy; clear definition of the mix waste problem nationwide, national prioritization of problems and identification of successful technologies for dealing with mix waste problems. EPA has suggested that certain federal facilities be used to test environmental technologies.

17.1 PANEL ON BUILDING A MULTI-MEDIA ENVIRONMENTAL PROGRAM

17.1 PANEL ON BUILDING A MULTI-MEDIA ENVIRONMENTAL PROGRAM

Panelist: Len Richardson, Director, Environmental Support Office
Captain James Taylor, Commander, Norfolk Navel Shipyard
Colonel Gerald P. Williams, Deputy Commanding Officer, Fort Belvoir

Moderator: Robert E. Greaves, Chief, RCRA Enforcement and UST Branch EPA, Region III

Richardson

Mr. Richardson discussed the Department of Defense (DoD) headquarter's perspective on environmental issues. He stated there is a sincere apathy in the DoD to meet environmental responsibilities, however within the past year some progress has been made.

In August of 1989, Secretary Cheyney challenged the DoD to be the federal leader in environmental compliance and protection. Secretary Cheyney stated that environmental consideration must be integrated and budgeted into all activities and that meeting environmental standards must be a command priority at all levels. Environmental concerns need to be clearly communicated. The Environmental Support Office created defense and environmental initiatives to meet Secretary Cheyney's challenge.

Mr. Richardson referred to an Environmental Initiatives Forum held at an earlier date. At this conference, Secretary Cheyney addressed issues regarding defense and the environment. He said to choose between them is impossible in this real world of serious human threats and general environmental concern. The goal is to build environmental ethic into the daily business of defense. Good environmental planning and management need to be exercised before actions are taken. The environmental initiatives are designed to produce a plan and to integrate goals into day to day operations. Mr. Richardson presented the three phases of the environmental initiatives process as follows; assess military conformance and progress, develop broad sustainable compliance and, develop leadership goals with cost schedules.

The greatest challenge within the DoD vision is to sustain the momentum they have now. To meet this challenge, the DoD is developing a strategy by 1992. This strategy will include every aspect of how the DoD carries out business. Operation and installation, acquisition of major weapons systems, procurement of equipment and supplies, and production of military materials will be analyzed. The following list indicates the goals DoD hopes to accomplish as part of the 1992 strategy:

- Help command the environmental mission to maintain momentum and support.
- Provide adequate policy, dollars, and manpower.
- Provide institutional and educational training to advance knowledge in the field.
- Establish environmental career field for military and civilian personnel with pay comparable to private industry.

- Involve public and regulators early in the decision process.
- Provide a clear road map of how to solve environmental problems more efficiently.

An environmental management study will be developed as part of the overall defense management review process. The study objectives are to reduce overhead costs and provide a solid basis for establishing DoD leadership in environmental activities. The goal of the study is to look at the organizational structure in the DoD in order to streamline the environmental structure and implement environmental programs.

Congress has implemented a new resource management program to establish a recommitment to natural resources and to develop, identify, and manage all significant wildlife, geophysical, cultural, and historical resources on DoD land.

Taylor

Captain Taylor discussed his experiences in using total quality management to conduct operations at the navy's oldest and largest industrial facility. A brief introduction to the Norfolk Naval Shipyard was presented along with discussion of the strategic plan and vision of how they were set up to mold environmental policy to support daily business at the yard.

Since Norfolk Naval Shipyard started operations in 1776, environmental problems have been building. The 1300 acre shipyard sits on the south branch of the Elizabeth River. All work required on navy ships takes place in this yard.

The following are significant principles for a successful environmental program which are outlined in the strategic operations plan for the shipyard;

1. Incorporate total quality management or total quality leadership principles into daily business at Norfolk Naval Shipyard.
   A. Establish a Quality and Productivity Improvement Committee
   B. Maintain a well trained work force.
   C. Establish levels of management to insure quality processes.
2. Define responsibilities.
3. Incorporate planning and design.
4. Hold annual audits.
5. Maintain enforcement crews to hold daily inspections.

In his summary, Captain Taylor emphasized the following key elements for successful total quality management;

1. Investment of resources
2. Corrective action programs

3. Communication with work force
4. Commitment

In his closing remarks he noted that if all of the elements are not activated, there will not be a total program.

Williams

Colonel Williams emphasized that federal facility compliance to the detail is very important and everyone at the conference can help achieve this. Fort Belvoir is going to go through a lot of what the Norfolk Naval Shipyard has already done to get their program organized and on the correct path.

Colonel Williams gave examples of how unaware personnel may be of many materials in existence on the installation. Therefore, an emphasis on education as well as public involvement should be made.

Greaves

Mr. Greaves feels the following six areas are needed for maintaining and developing multi-media environmental planning;

1. Establish a high level of focus for program compliance.
2. Develop environmental management systems.
   - Perform comprehensive waste characterization
   - Perform internal audits
3. Improve environmental support services.
4. Implement training.
5. Coordinate environmental planning.
6. Integrate new regulations.

18.1 OVERVIEW OF CHESAPEAKE BAY FEDERAL FACILITY COMPLIANCE INITIATIVE AND WHAT WE WILL DO NEXT

18.2 ATTACHMENTS

- List of Federal Facilities Covered by EPA, Region III, Chesapeake Bay Multi-media Federal Facility Compliance and Enforcement Initiative

- EPA Chesapeake Bay Federal Facility Compliance Initiative

18.1 OVERVIEW OF CHESAPEAKE BAY FEDERAL FACILITY COMPLIANCE INITIATIVE AND WHAT WE WILL DO NEXT

Neil Swanson, Manager, Bay Federal Facilities and Multi-Media Compliance Initiative EPA, Region III

When EPA Administrator, William Reilly, accepted the Chair of the Chesapeake Bay Executive Council in December, 1989, one of his goals for 1990 was to make the federal community a role model for environmental compliance. The Chesapeake Bay Federal Facility Compliance Initiative was a direct result of this commitment and the goal of physical compliance or a signed compliance agreement with EPA or the State by December 31, 1990 was established. In this presentation, a status of the Initiative to date was presented as outlined in the attached materials. A great deal of progress has been made, yet a number of facilities must still come into compliance. The majority of the presentation covered issues and challenges which have arisen during this Initiative. Many are listed in the attached material. The key items on the positive side have been an increased level and detail of communication, high level attention given to environmental issues, and the ability to expedite the bureaucratic process to achieve results.

On the downside, EPA Region III has encountered some data and inspection reporting delays, some legal and resource impediments and have found it difficult to transfer successes into quantifiable environmental improvements. EPA's general plans for the upcoming year were outlined. EPA will continue its emphasis on Bay federal facility compliance. However, pollution prevention and long-term compliance strategy development will be emphasized. The momentum gained by this year's initiative must be maintained and converted into long-term success. Again, the goal of the federal community as the role model for environmental compliance can and shall be achieved through a partnership between EPA, the States and the federal facilities.

The federal facilities initiative has two goals:

1) 100% compliance.
2) Establish a continuous cooperative effort to build on.

Mr. Swanson recognized the accomplishment of these goals as being a fairly tough task, he focused on major issues.

Of 50 facilities on the list, 37 started in non-compliance. There are 12 facilities still in non-compliance and 9 new violators have been added to the list.

Issues and challenges that face all facilities are as follows:

1) Communication and information transfer.

2) Training in new regulations (For example, new regulations being developed for storm water discharge).
3) Establishing data tracking systems.
4) Developing a multi-media approach.
5) Developing compliance indicators.
6) Promotion of success story publicity.

EPA is an regulatory agency and they are supposed to enforce all laws and regulations. The public looks to EPA to enforce regulations. In working with the Department of Defense, the EPA must keep its purpose in mind.

Problems created over legal versus technical issues cause difficulties for facilities. Legal issues take time to solve. The Department of Defense is now beginning to achieve federal compliance and there are many legal issues for them to go through.

Facilities also need to know who the actors are in the bureaucratic arena and what resources are available to them. A long term multi-media environmental strategy, including inspection plans, needs to be developed and public involvement must be initiated. The bottom line, according to Mr. Swanson is that the federal government should be taking the lead in all of these issues.

LIST OF FEDERAL FACILITIES
COVERED BY
EPA, REGION 3
CHESAPEAKE BAY MULTI-MEDIA FEDERAL FACILITY
COMPLIANCE AND ENFORCEMENT INITIATIVE

For more information contact:
Neil R. Swanson (215) 597-6509
or
Koge Suto, Jr. (215) 597-1231

INTRODUCTION

The attached list was compiled to support one of two compliance goals that the U.S. Environmental Protection Agency has set for all federal agencies with facilities located in the Chesapeake Bay watershed. The goal is to achieve full federal facility compliance in the watershed by December 31, 1990. EPA is working with the District of Columbia and with the Bay states--Maryland, Pennsylvania, and Virginia--who have primary authority for most environmental programs, to achieve this goal within this short timeframe.

The parameters of this goal can be defined as follows:

1. It applies to all major federal facilities or those that have a potential major impact on Chesapeake Bay water quality. This includes, but is not limited to, all facilities that are in significant noncompliance (SNC) or its equivalent in the Bay drainage area. It also includes all Department of Defense (DOD) facilities listed in Appendix B of the EPA/DOD Cooperative Agreement, i.e., those facilities that were identified through the Tetra-Tech study as having a potential for significant impact on the Bay's water quality.

2. EPA and the States will be seeking compliance for all sources that significantly impact the Bay in all environmental programs for which we have regulatory authority. This includes

   --National Pollutant Discharge Elimination System (NPDES),
   --Resource Conservation and Recovery Act (RCRA) Program,
   --Air emissions if the source will have a signi ficant impact on Bay water quality,
   --PCB requirements of the Toxics Substances Control Act (TSCA), and
   --any hazardous waste sites that are currently on the National Priority List (NPL) or proposed to be listed.

3. Violations of other programs that may not have a direct impact on Bay water quality may be included during the negotiation of compliance agreements. For example,

   --violations of drinking water standards for public water systems,
   --violations of requirements for the removal and disposal of asbestos in buildings (NESHAPS),
   --PCB record-keeping and labelling violations,
   --RCRA Class II violations, and

--any violations of air emissions standards without significant impact on the Bay.

4. Our primary goal is physical compliance by December 31, 1990. If that cannot be reasonably achieved within the established timeframe then we will seek a legally binding agreement containing a schedule for compliance beyond December 31, 1990 signed by the federal agency and EPA or the appropriate State agency.

5. The attached list focuses on SNC or its equivalent based on data available as of December 31, 1989. It is a dynamic list that will be changed as facilities achieve compliance or go into noncompliance status during the year. EPA and the States will continue to monitor for new violations that come to our attention by December 31, 1990. Violations that occur within this timeframe will be added to the list.

There is another concurrent compliance goal that federal facilities should be aware of. During the same timeframe, EPA and the Bay States will be taking appropriate action to cut the NPDES SNC rate in half. The parameters of this goal can be defined as follows:

--The goal applies to all facilities in the Chesapeake Bay watershed with major NPDES permits, i.e., municipal, industrial, and federal facilities,

--The goal is 50 percent reduction of the rate of SNC by December 31, 1990. (The rate of SNC was 8.3 percent in 1989, including federal facilities.)

--The goal is physical compliance by December 31, 1990 or a legally enforceable document (compliance agreement or consent order) establishing a schedule for compliance signed by the facility and EPA or the appropriate state authority.

NOTE: Any federal facilities in SNC under the NPDES program are already included on the attached list.

Definition of Significant Noncompliance

To assist you with understanding the attached list we have provided brief summaries of the definition of Significant Noncompliance (SNC) or its equivalent for each media program cited in the list. The guidance establishing these definitions is much longer and more complex. For this reason, we have also identified an EPA or, where appropriate, State contact for each program. If you have any questions about the violations cited or if you want more detailed information on SNC, please call the designated contact directly.

In addition, EPA and the States expect all violations to be corrected. Obviously, violations vary in degree and SNC is an attempt to identify serious violations and chronic violators that require priority attention.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

Contact: EPA - Carol Stokes-Cawley, Chief
General Enforcement Section
Water Management Division
(215) 597-3689

State - (MD) Merrylin ZawMon (301) 631-3574
James Pittman (301) 631-3386
Maryland Dept. of the Environment

(PA) Stan Rudisill, Bureau of Water Quality Management, Pennsylvania Dept. of Environmental Resources
(717) 787-8184

(VA) John Roland
State Water Control Board
(804) 367-6775

All violations of NPDES permit conditions and enforcement orders are violations of the Clean Water Act. The term "Significant Noncompliance" (SNC) identifies the most serious violations including:

-- any monthly average effluent violation that meets the Technical Review Criteria (TRC)*, for the same parameter at the same outfall, occurring at least two months within a six month period.
-- any monthly average effluent violation, for the same parameter at the same outfall, occurring at least four months within a six month period.
-- any effluent violation that causes or has the potential to cause a water quality or public health problem.

NPDES (cont'd)

- -- any violation of a compliance schedule milestone date by 90 days or more (i.e., start of construction, end of construction, attain final compliance).
- -- any report late by 30 days or more.
- -- any violation of permit requirements (pretreatment program, narrative conditions).
- -- any violation of an enforcement order (administrative and judicial).

NOTE: For purposes of the Chesapeake Bay Initiative, all instances of NPDES program noncompliance will be addressed.

*TRC is a factor by which the monthly average pollutant limit is multiplied to determine the severity of a violation. The TRC for conventional pollutants is 1.4; the TRC for toxic pollutants is 1.2. If an effluent violation exceeds the product of the permit limit for that parameter multiplied by its TRC, it is designated as a TRC violation.

Example

- -- The monthly average permit limit is 30 mg/L (conventional pollutant).
- -- The reported monthly average result is 45 mg/L.
- -- 1.4 (TRC) x 30 mg/L (permit limit) = 42 mg/L
  Since the reported result (45 mg/L) exceeds 42 mg/L, it is considered a TRC violation. Two TRC violations of the same parameter at the same outfall within a six month period indicates significant noncompliance.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

Contact: EPA - John G. Nevius
State Enforcement Section
Hazardous Waste Management Division
(215) 597-2381

State - (MD) Butch Dye, Maryland Dept. of the Environment
(301) 631-3400

(PA) Rick Shipman, Bureau of Waste Management
Pennsylvania Dept. of Environmental Resources
(717) 787-6239

RCRA (cont'd)

(VA) Karol Akers
Virginia Dept. of Waste Management
(804) 225-2496

The RCRA program classifies both violators and violations. It does not use the term significant noncompliance.

A High Priority Violator (HPV) is a handler who causes or poses a substantial likelihood of exposure to waste or its constituents. An HPV is a chronic violator or one who substantially deviates from program requirements or the terms of a permit, order, or decree by failing to comply in a timely manner. Regulating officials consider the combined effect of violations, the result of previous inspections, and the violator's responsiveness in correcting previous violations in classifying a violator as an HPV.

A Medium Priority Violator (MPV) is a handler with one or more Class I violations who does not meet the criteria for an HPV.

RCRA violations are classified as follows:

Class I - Any deviation from regulations, or provisions of compliance orders, consent decrees or agreements, or permit conditions which could result in failure

--to assure that hazardous waste is destined for and delivered to authorized treatment, storage, or disposal facilities (TSDF's); or
--to prevent releases of hazardous waste or its constituents, both during the active life and applicable post-closure periods of the facility operation where appropriate; or
--to assure early detection of releases; or
--to perform emergency clean-up or other correc tive action for releases.

Class II - Any other violation that would not be considered a Class I violation.

AIR

Contact: EPA - Christie Johnson
Enforcement Policy and State Coordination Section
Air, Toxics & Radiation Management Division
(215) 597-3023

AIR (cont'd)

State - (DC) Don Wambsgans, Chief
Engineering Services Section
DC Dept. of Consumer & Regulatory Affairs
(202) 767-7370

(MD) Ronald E. Lipinski, Administrator
Enforcement Program, Air Mgmt. Administration, Maryland Dept. of the Environment
(301) 631-3220

(PA) Jim Salvaggio, Chief, Abatement & Compliance Division, Bureau of Air Quality Control, Pennsylvania Dept. of Environmental Resources
(717) 787-9256

(VA) Pam Faggert, Director
Division of Technical Evaluation,
Virginia Dept. of Air Pollution Control
(804) 786-5481

A violator is identified as a significant violator if they meet any one or more of the following criteria:

1. A source that is in violation of National Emissions Standards for Hazardous Air Pollutants (NESHAPS) requirements other than asbestos demolition and renovation requirements.
2. A source violating new source requirements, including New Source Performance Standards (NSPS), Prevention of Significant Deterioration (PSD) requirements, and Part D nonattainment area permitting requirements.
3. A Class A source that is in violation of a State Implementation Plan (SIP) if the source is located where it will impact a nonattainment area and is violating the pollutant for which the area is in nonattainment.
4. A source that is violating a federal consent decree or administrative order or a state consent decree or administrative order (because the source would also be in violation of the SIP). A source violating a state decree or order is a significant violator only if the decree/order addresses violations for pollutant for which the area is in nonattainment.
5. Any federal facility violator.

PCB REQUIREMENTS OF THE TOXIC SUBSTANCES CONTROL ACT (TSCA)

Contact: EPA - John Ruggero, Chief
TSCA Enforcement Section
(215) 597-9937

The TSCA program defines SNC as a violation of one of the regulations under TSCA that will result, at a minimum, in an administrative complaint issued in accordance with the appropriate Enforcement Response Policy, and for which the penalty will be at least $25,000. For federal facilities, a facility is in SNC if the violation(s) would normally result in a formal enforcement action. However, these actions are handled in accordance with the EPA Federal Facility Compliance Strategy (the Yellow Book).

SAFE DRINKING WATER ACT (SDWA)

Contact: EPA - Thomas Conlon, Enforcement Coordinator
Water Management Division
(215) 597-8241

Patti Kay Wisniewski (for general drinking water info.), Water Management Division
(215) 597-9032

State - (MD): Barry O'Brien, Chief, Facilities Inspection Division, Water Supply Program, Maryland Department of the Environment
(301) 631-3706

(PA): Jeff Gordon, Compliance & Enforcement Unit, Division of Water Supplies, Pennsylvania Dept. of Environmental Resources (717) 787-9037

(VA): Evans Massie, Division of Water Supply Engineering, Virginia Dept. of Health
(804) 786-1766

The SWDA regulates public water systems. A community water system would be in SNC if it meets any of the following criteria:

1. violates the Maximum Contaminant Level (MCL) for microbiological contaminants <u>or</u> turbidity for four or more months during any 12 consecutive month period, or

SDWA (cont'd)

2. is a major violator of monitoring or reporting requirement for microbiological contaminants <u>or</u> turbidity <u>or</u> Total Trihalomethane (TTHM) for 12 consecutive months, or
3. violates the MCL for microbiological contaminants <u>or</u> is a major violator of the monitoring requirments for these contaminants for a combined total of 12 consecutive months, or
4. violates the MCL for turbidity <u>or</u> is a major violator of the monitoring requirments for this contaminant for a combined total of 12 consecutive months, or
5. exceeds the level for which exemptions may be issued for any regulated inorganic, organic (excluding TTHM), or radiological contaminant, or
6. exceeds the MCL for TTHM for two or more running annual averages during the year, or
7. fails to monitor for or report the results of any one of the currently regulated inorganic, organic (other than TTHM), or radiological contaminants since the Federal requirements for that contaminant became effective (June 24, 1977), or
8. violates a requirement of a written and bilaterally negotiated compliance schedule.

NOTE: EPA's Drinking Water Program is modifying the SNC definition, which will be used beginning in FY91. It will include non-transient, non-community water systems in FY91 (they are not covered by the present definition for SNC). Transient, non-community water systems serving 500 or more people will be included in FY92, followed by all remaining systems in FY93. EPA anticipates that this change will increase the number of water systems in SNC.

Chronic violators of drinking water regulations are classified as persistent violators. A community water system is a persistent violator if during a 12 consecutive month period, it

-- has four or more monthly violations of the bacteriological or turbidity MCL's or the monitoring and reporting requirements for these MCL's.
-- has had two or more quarterly violations of the bacteriological or turbidity MCL's or the monitoring and reporting requirements for these MCL's.
-- has violated the TTHM MCL for one running annual average.
-- has violated the monitoring and reporting requirements for TTHM for two or three quarters.

SDWA (cont'd)

NOTE: If a system meets the persistent violator definition and the SNC definition, the system is considered as SNC.

KEY TO IDENTIFYING INFORMATION IN THE CHESAPEAKE BAY FEDERAL FACILITIES LIST

The list will receive a new date whenever changes are made to it. Check the date in the upper left corner of the page to ensure that you are working from the most recent copy of this list.

Column 1 State/NPDES Number - If the facility has a current NPDES permit, the number of that permit will appear in this column. If the facility has more than one permit, additional permit numbers may appear under the "Comments" column.

Column 2 Facility Name - The name of the facility as it appears in EPA data bases.

Column 3 Federal Facility I.D. Number - The number assigned to each federal facility in the GSA data base.

Column 4 New Violation Since 12/89 - Violations that occurred during/since December 1989 will be identified by a "T" (True). Violations that occurred before December 1989 will be identified by an "F" (False).

Column 5 Date of Compliance or Agreement - When a facility achieves physical compliance or signs a compliance agreement, the date will appear in this column.

Column 6 Comments - This column will be used to identify the media program in which the violations occurred and a brief description of the nature of the violations. It will also indicate the activities which have been conducted to bring the facility into compliance.

EPA CHESAPEAKE BAY

FEDERAL FACILITY COMPLIANCE INITIATIVE

1990

December 5, 1990

GOALS

- o 100% COMPLIANCE OF BAY FEDERAL FACILITIES BY DECEMBER 1990

- o ESTABLISH CONTINUING COOPERATIVE EFFORT WITH ALL FEDERAL FACILITIES TO ENSURE ONGOING COMPLIANCE

HIGHLIGHTS OF FEDERAL FACILITY INITIATIVE

o GEOGRAPHIC AREA: ENTIRE CHESAPEAKE BAY WATERSHED

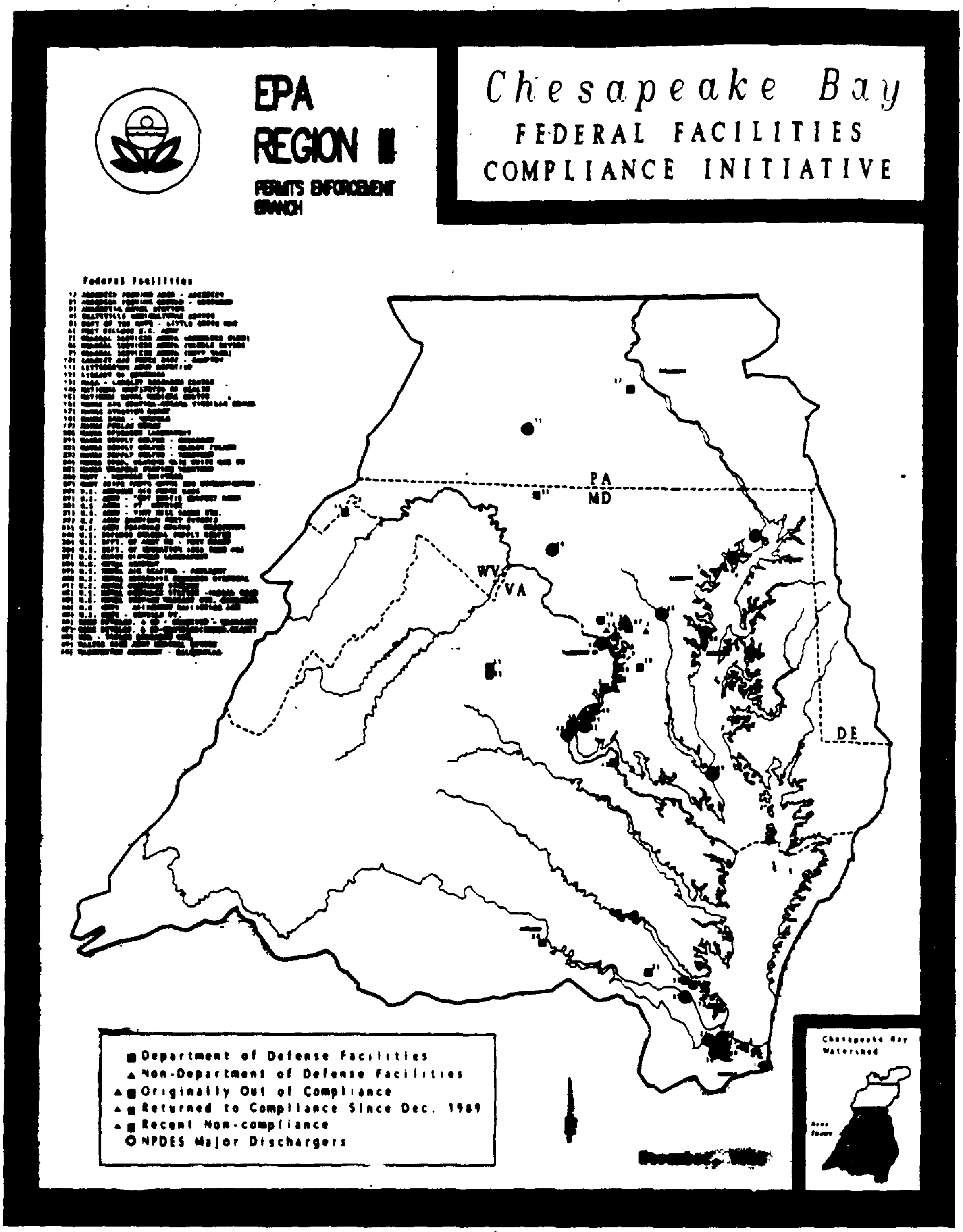
o MULTI-MEDIA PROGRAM COVERAGE
(NPDES,SDWA,RCRA,NPL,TSCA,AIR)

- MAJOR VIOLATIONS AS OF DECEMBER 1989
- SIGNIFICANT POTENTIAL IMPACT ON BAY
- ALL MAJOR NPDES FEDERAL FACILITIES IN BAY
- TOTAL OF 50 DOD AND NON-DOD FEDERAL FACILITIES

o OBJECTIVE: ATTAIN PHYSICAL COMPLIANCE IF POSSIBLE, OR IF NOT, FORMAL AGREEMENT WITH EPA AND/OR STATE CONTAINING SCHEDULE FOR ACHIEVING COMPLIANCE

o STATIC LIST: CURRENT KNOWN VIOLATIONS ARE TOP PRIORITY

o DYNAMIC LIST: WILL EXPEDITIOUSLY WORK TO RESOLVE ANY NEW NONCOMPLIANCE (MAJOR AND MINOR)


EPA
REGION III
PERMITS ENFORCEMENT BRANCH
Chesapeake Bay
FEDERAL FACILITIES
COMPLIANCE INITIATIVE
Federal Facilities
PA
MD
WV
VA
DE
Department of Defense Facilities
Non-Department of Defense Facilities
Originally Out of Compliance
Returned to Compliance Since Dec. 1989
Recent Non-compliance
NPDES Major Dischargers

STATUS OF CHESAPEAKE BAY FEDERAL FACILITY COMPLIANCE INITIATIVE (Through November 1990)

START OF INITIATIVE - DECEMBER 1989

13 - COMPLIANCE
(13 DoD)

37 - NONCOMPLIANCE
(29 DoD, 8 NON-DoD)

STATUS THROUGH OCTOBER 1990

38 - COMPLIANCE
(32 DoD, 6 NON-DoD)

12 - NONCOMPLIANCE
(10 DoD, 2 NON-DoD)

25 RETURNED TO COMPLIANCE STATUS
(ACTUAL OR COMPLIANCE SCHEDULE)
(19 DoD, 6 NON-DoD)

ASSESSING POTENTIAL NEW VIOLATIONS

9 Facilities - New Noncompliance Since 9/15/90
(8 DoD, 1 NON-DoD)

3 - COMPLIANCE
(3 DoD)

6 - NONCOMPLIANCE
(5 DoD, 1 NON-DOD)

ISSUES/CHALLENGES

1. Communication/Information Exchange

   (EPA, States, Facilities)

2. Training/Complexity of Regulations

3. Data/Tracking Systems Inadequate

4. Multi-Media Approach Difficult

5. How do we show environmental improvements?

6. Foster partnerships yet maintain enforcement presence

7. New noncompliance

8. Inspection report delays

9. Legal vs technical issues

10. Bureaucratic process

    - Organizational structures

    - EPA vs State enforcement lead

    - Escalation process

    - Resources

WHAT'S NEXT?

1. Continue process/partnerships established

2. Expand to include all media

   (i.e., UST, asbestos)

3. Pollution prevention

4. Develop long term multi-media environmental compliance strategy.

5. Federal community as role model

19.1 STATUS REPORT FROM THE WORKING SESSION ON THE LONG-TERM COMPLIANCE PLAN

19.2 ATTACHMENTS

- Compliance Monitoring and Enforcement Strategy for the NPDES Program

19.1 STATUS REPORT FROM THE WORKING SESSION ON THE LONG-TERM COMPLIANCE PLAN

Carol Stokes-Cawley, Chief NPDES General Enforcement Section EPA, Region III

Ms. Cawley reported that last December, under the Chesapeake Bay Compliance Initiative (CBCI), Administrator Riley set two compliance goals for the Chesapeake Bay. One was to cut significant non-compliance or water violators in half by the end of the year. The second was to have all federal facilities in 100% compliance by the end of the year. During the year, EPA, DoD, and other federal facilities have been doing a lot of things innovatively and differently to work toward accomplishing the administrative goals.

To provide a preliminary evaluation of the 1990 Initiative in the Chesapeake Bay and to develop a set of recommendations for 1991 which build upon the efforts to achieve 100% compliance, a working session was planned at the Federal Facilities Conference. The session, which consisted of over 90 people, broke into groups. Each group came back with two things that worked and two things that needed improvement in the initiative. Each participant was asked to vote for one activity or program identified as the most successful component of the initiative and one activity or program that needed improvement. The results are as follows:

Strengths of the Initiative

- High command attention (helped communication and budgeting)
- Communication between EPA, State and facilities has improved because of initiative
- Priorities were established
- Willingness by Regulators to participate more freely in negotiations
- Meetings with workers and all levels
- Summarized what needed to be done and feedback from EPA
- Information good and helpful
- August, 1990 meeting - Facility, EPA, States (mtg. in Washington, D.C., which promoted communication) facilitated communication (went through the UST)
- Progress report helped get out information on good things going on at facilities (D.O.D. progress report).

Weaknesses of the Initiative

- List: Not Accurate
Accusatory
Not Timely
Doesn't reflect risk
Can't get off
- Unrealistic expectation or goal (100%)
- Lack of awareness of goals - what they mean; how they were established

- Need clear direction to come into compliance and leeway for budget decisions
- Haste makes waste - Forced into initiative under tight timeframe
- Emphasis only on D.O.D. facilities - need to bring in others
- Communications - Late notification of initiative
- Accusatory language - showing up on list before formal notification to federal facility of violation.

In the second half of the work session, individuals were asked to recommend activities that would improve compliance in the long term. The following are a few of the ideas which were discussed;

1) Develop a realistic program, a goal outline, and a specific reporting outline.
2) Focus on environmental audits to assure continued compliance (recommended EPA conduct more multi-media inspections).
3) A yearly tour of the hazardous storage areas of the facility by the commander.
4) Develop a better exchange of information and even better communication among EPA, Federal Facilities, and State Agencies.
5) There is a need for more staff and adequate funding.
6) Publish a list of violators quarterly in local newspapers.
7) Perform multi-media inspections.
8) Compliance and agreement for compliance are not the same thing. Sustainability of compliance is an issue which needs to be resolved.

A questionnaire was also distributed that asked participants to identify an initiative that would improve compliance at Federal Facilities within the Bay Watershed. The following responses were compiled:

1) Better information exchange between EPA, Federal Facilities and states. Need info exchange mechanism. For example, we are trying to complete a corrective action plan for USTs. However, SWCB has yet to approve any CAP (Navy) or provide a model for an appropriate "approvable" (sic) CAP.

2) A yearly tour by the Facility Commander of areas used to store hazardous waste.

3) Identify requirements for environmental personnel at facility level and then approve "fenced" money to fund these people.

4) More staff and adequate funding at the activity level.

5) To have a realistic program and goal outline developed by joint committees to follow and a specific reporting outline.

6) Focus on environmental audits to insure continued compliance. Find areas that need work and then work toward corrective actions.

7) Communicate to facilities the potential impact on resources (i.e., budget, staff) to negotiate compliance versus cleaning up/preventing, by themselves.

8) That there be workshops by each state and their program for federal facility compliance.

9) Publish a list of violations every quarter in leading newspapers in that state.

10) If Chesapeake Bay Initiation is to clean up the water of the Bay, then information/inspection/attention should follow the 80/20 rule (80% problems by 20% causes). Major impact/improvement areas should be highlighted and activities should be emphasized in this area. For example, storm water management. What is the impact/benefit to the bay of BMP and retrofits of grandfathered facilities via the current posture of compliance? Would it be more beneficial to work on erosion or to address the asbestos portion of the Clean Air Act?

11) A. Redirect EPA resources to conduct more multi-media environmental audit of Federal Facilities. Follow-up the assistance visits with "inspection visits" to ensure the identified deficiencies have been corrected. The audits need to go beyond "regulatory issues" and address environmental management and pollution prevention issues.

B. Since "compliance status" is a relatively poor indicator of environmental quality, develop better measures of environmental quality.

C. Emphasize an enlightened self-interest and personal accountability among individuals as the key success factor to achieving environmental quality objectives.

12) I recommend that more pollution prevention initiatives be emphasized. This will put us on the course to substantial compliance by preventing the pollution in the first place. This would get us into the mode of not needing enforcement.

13) Compliance is not necessarily a measure of Environmental Quality. Recognize that compliance is only a part of the solution. Other parts of the solution relate to non-compliance issues, i.e., non-point source controls, programs, public awareness, the level of public participation or outdoor recreation use.

COMPLIANCE MONITORING
AND
ENFORCEMENT
STRATEGY

FOR THE

NPDES PROGRAM

CHESAPEAKE BAY

BY

STATE OF MARYLAND
STATE OF PENNSYLVANIA
STATE OF VIRGINIA
U.S. ENVIRONMENTAL PROTECTION AGENCY

1990

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CHESAPEAKE BAY

COMPLIANCE MONITORING
AND
ENFORCEMENT STRATEGY

WORK GROUP MEMBERS

MARYLAND:

PATSY ALLEN
JAMES METZ
JAMES PITTMAN
MERRILYN ZAW-MON

PENNSYLVANIA:

LEON OBERDICK
STANLEY RUDISILL

VIRGINIA:

JOHN ROLAND

EPA:

RICHARD KOZLOWSKI
TERRY ODA
JOSEPH PIOTROWSKI
CAROL STOKES-CAWLEY

INTRODUCTION

The Administrator of the U.S. Environmental Protection Agency (EPA), William J. Reilly at his inaugural to chair the Chesapeake Bay Executive Council on December 19, 1989, challenged members of the Council to improve compliance of dischargers in the Chesapeake Bay drainage area. Specifically, he challenged the States of Maryland, Pennsylvania and Virginia, and the EPA to:

- Reduce significant noncompliance by 50%, and
- Bring federal facilities into compliance.

Both of these goals were to be achieved by the end of 1990.

The States and EPA accepted the challenge and proceeded to work together to improve coordination and cooperation between the agencies. Further, established compliance monitoring and enforcement procedures were reviewed and improved as necessary and feasible within the time constraints.

Predicting success of the compliance initiative, the States and EPA formed a work group to develop a long term Compliance Monitoring and Enforcement Strategy to build upon that success. The goal of the strategy is to continuously improve the effectiveness of the compliance monitoring and enforcement program of the agencies to ensure that noncompliance will continue to diminish. This, in turn, will ensure that the goals to reduce pollution and restore the living resources of the Chesapeake Bay will be achieved and maintained.

The Strategy has twenty-one objectives which will be accomplished over the next few years. A committee composed of staff from the States of Maryland, Pennsylvania and Virginia and EPA will be convened to oversee the implementation of the Strategy. The committee's responsibility will be to initially develop an implementation plan by spring 1991, and subsequently, to ensure that the plan is being implemented. The Committee will also prepare periodic reports on the status of implementation and of compliance in the Chesapeake Bay drainage area. These reports will be submitted to the various committees of the Chesapeake Bay Program and the general public.

CHESAPEAKE BAY

COMPLIANCE MONITORING AND ENFORCEMENT STRATEGY

FOR THE NPDES PROGRAM

PURPOSE:

MAXIMIZE NPDES COMPLIANCE TO ENSURE THE PROTECTION OF PUBLIC HEALTH, THE ENVIRONMENT AND LIVING RESOURCES.

ENHANCE COOPERATION AND COORDINATION AMONG THE STATES AND EPA TO CONTINUOUSLY IMPROVE COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS IN THE CHESAPEAKE BAY DRAINAGE AREA.

GOALS OF THE STRATEGY:

- ESTABLISH PROCEDURES FOR CONTINUOUSLY IMPROVING COMPLIANCE IN THE CHESAPEAKE BAY WITH THE AIM OF ELIMINATING NONCOMPLIANCE.

- ESTABLISH A COMMON BASIS FOR INITIATING AND RESOLVING ENFORCEMENT ACTIONS.

- ESTABLISH PROCEDURES FOR COOPERATION AND COORDINATION TO MAKE EFFECTIVE USE OF THE RESOURCES AND STRENGTHS OF THE INDIVIDUAL STATES AND EPA, AND PREVENT DUPLICATION OF EFFORT.

- PROMOTE THE USE OF POLLUTION PREVENTION METHODS WHICH CONSIDER MULTI-MEDIA IMPACTS TO MAXIMIZE ENVIRONMENTAL AND PUBLIC HEALTH BENEFITS.

CHEASAPEAKE BAY

COMPLIANCE MONITORING
AND
ENFORCEMENT STRATEGY

FOR THE
NPDES PROGRAM

1. MAKE EFFECTIVE USE OF CURRENT ENFORCEMENT AUTHORITIES.

OBJECTIVE 1.1: Maintain the Exceptions List at zero after July 1, 1991 thru:

1.1.1 Taking formal enforcement action against all violators in significant noncompliance (SNC) for the same pollutant before the end of the second consecutive quarter for which such violations persist (timely and apropriate enforcement actions).

1.1.2 Using EPA to notify SNC dischargers of potential federal actions where the state feels federal assistance would assist in quick resolutions.

1.1.3 Initiation by EPA of appropriate enforcement action (after consultation with the state), when timely and appropriate enforcement action has not been taken by the state to prevent a violator from appearing on the Exceptions List.

1.1.4 Referral of state selected cases to EPA for federal enforcement.

OBJECTIVE 1.2: Eliminate SNC by January 1, 1993 thru:

1.2.1 Developing procedures to identify and address violations before they become SNC, including reviewing historical violators to ensure that past problems have been fully addressed and closely monitoring dischargers who are discharging at levels near their limitations.

1.2.2 Rapidly escalating enforcement responses to prevent violations from becoming significant.

1.2.3 Establishing clear enforcement response criteria to ensure that appropriate enforcement actions are taken to address violations.

OBJECTIVE 1.3: Expand the use of criminal sanctions to ensure the integrity of the the self monitoring and reporting system of the NPDES program by:

1.3.1 Establishing criteria for screening information to identify criminal activity.

1.3.2 Developing procedures to investigate suspect situations to identify the violation and determine its nature.

1.3.3 Improving communication betwen state and federal criminal investigators and prosecutors on possible criminal cases.

OBJECTIVE 1.4 Improve oversight on Federal Facilities to ensure compliance is expeditiously achieved and maintained by:

1.4.1 Developing state and EPA procedures promptly notifying a federal facility of the occurrence of a violation and for escalating enforcement response.

1.4.2 Establishing an early decision point for possible state referral to EPA of federal facility cases.

1.4.3 Revising procedures in EPA to promptly resolve federal compliance issues.

1.4.4 Providing quarterly federal facilities compliance status reports to the DOD Chesapeake Bay coordinator for senior level DOD assistance in resolving noncompliance.

2. ESTABLISH A COMMON BASIS FOR INITIATING AND RESOLVING ENFORCEMENT ACTIONS.

OBJECTIVE 2.1: Use common procedures and criteria to rapidly identify and address noncompliance, including the following:

2.1.1 Requiring and reviewing DMR's on a monthly basis to identify all types of violations.

2.1.2 Establishing enforcement reponse criteria to estimate violations.

2.1.3 Establishing quality control criteria or automating DMR review of major facilities to ensure consistent evaluation.

2.1.4 Revising Enforcement Management Systems to reflect any updated procedures.

OBJECTIVE 2.2: Enhance pretreatment enforcement by addressing failure by Municipal Treatment Plants to adequately implement their programs and enforce noncompliance of Industrial Users by:

2.2.1 Improving monitoring of pretreatment implementation where appropriate thru increased use of biomonitoring and chemical pollutant specific analysis at municipal plant discharges.

2.2.2 Implementing pretreatment training programs for municipalities

2.2.3 Increasing the severity of enforcement responses against all pretreatment violations, including the assessment of penalties.

2.2.4 Adding pretreatment violations to the Quarterly Non-Compliance Reports (QNCRs).

2.2.5 Increasing use of enforcement against violations by Industrial Users by EPA and the states.

2.2.6 Identifying, monitoring and enforcing when necessary at Industrial Users discharging to municipalities not required to have pretreatment programs.

OBJECTIVE 2.3: Closely monitor permits with new NPDES requirements to maintain high compliance rates by:

2.3.1 Developing requirements in new permits or companion enforcement orders for toxics, stormwater, sludge and Combined Sewer Overflows to meet water quality standards.

2.3.2 Revising procedures to monitor the permits to ensure that compliance with new program requirements will be timely achieved, or that appropriate enforcement proceedings are taken at an early date.

OBJECTIVE 2.4: Increase emphasis on minor NPDES facilities in the Chesapeake Bay compliance and enforcement program by:

2.4.1 Developing procedures to maintain or progressively increase where necessary the number of minor dischargers routinely monitored for compliance.

2.4.2 Setting priorities for addressing minor dischargers based on impacts on water quality and living resources.

OBJECTIVE 2.5: Increase enforcement of operator certification and training requirements at Wastewater Treatment Plants by:

2.5.1 Implementing a standard permit condition to make operator certification an enforceable permit requirement.

2.5.2 Requiring periodic renewal of the license or annual continuing education obligations for the municipal treatment plant operators.

2.5.3 Expanding operator licensing for pretreatment and wastewater treatment operators at industrial plants.

OBJECTIVE 2.6: Use and improve the quality of the Permit Compliance System (PCS) to review waste loads, evaluate trends and assess compliance by:

2.6.1 Commiting the necessary resources to ensure data quality to make PCS the common NPDES data base for the Bay.

2.6.2 Continuing efforts by EPA to make PCS more user friendly in all aspects of data entry and use.

3. TARGET ENFORCEMENT ACTIONS FOR MAXIMUM ENVIRONMENTAL RESULTS.

OBJECTIVE 3.1: Target inspections at dischargers in noncompliance to improve compliance by:

3.1.1 Targeting inspections at violators; where resources are limited.

3.1.2 Revising criteria for prioritizing inspection targets.

3.1.3 Evaluating and developing improved inspection procedures if necessary.

3.1.4 Establishing a field citation program where appropriate.

3.1.5 Conducting Bay-wide inspector training thru EPA sponsorship.

OBJECTIVE 3.2: Target compliance monitoring and enforcement actions at environmentally sensitive areas to enhance protection of the living resources by:

3.2.1 Identifying areas sensitive to point source discharge violations.

3.2.2 Ensuring both major and minor permits specify requirements that are sufficiently stringent to protect against adverse effects and are clearly enforceable.

3.2.3 Developing and implementing an education program to heighten the sensitivity of the dischargers to the living resources needing protection.

3.2.4 Establishing a method for quick detection of violations and criteria for early enforcement response in sensitive areas.

4. ESTABLISH PROCEDURES FOR COOPERATION AND COORDINATION TO MAKE EFFECTIVE USE OF THE RESOURCES AND STRENGTHS OF THE INDIVIDUAL STATES AND EPA, AND PREVENT DUPLICATION OF EFFORT.

OBJECTIVE 4.1: Strengthen the enforcement partnership by improving procedures for sharing of information and responsibilities between the states and EPA.

OBJECTIVE 4.2: Increase the use of administrative and civil penalty authorities of the states to those established under the federal Clean Water Act by:

4.2.1 Increasing administrative, civil and criminal enforcement authorities at least equivalent to those authorized under the Clean Water Act where necessary.

4.2.2 Developing and adopting a state-wide penalty policy that will recoup,-where appropriate, economic benefit and gravity of the violations.

OBJECTIVE 4.3: Continue to conduct state/EPA quarterly enforcement meetings to review noncompliance and enforcement plans.

OBJECTIVE 4.4: Continue to conduct joint annual meetings to share information and accomplishments between all states and EPA.

5. PROMOTE THE USE OF POLLUTION PREVENTION METHODS WHICH CONSIDER MULTI-MEDIA IMPACTS TO MAXIMIZE ENVIRONMENTAL AND PUBLIC HEALTH BENEFITS.

OBJECTIVE 5.1: Establish Chesapeake Bay-wide NPDES compliance awards to create positive reinforcement to comply by:

5.1.1 Developing criteria for identifying exemplary dischargers.

5.1.2 Establishing an awards system, including frequency and type of award, selection committee, etc.

OBJECTIVE 5.2: Establish municipal wastewater pollution prevention (MWPP) programs to promote compliance at POTW's thru:

5.2.1 Defining the basic elements of a MWPP programs applicable to all Bay municipal facilities.

5.2.2 Implementing a MWPPP appropriate for each state.

OBJECTIVE 5.3: Conduct periodic conferences with the regulated community to discuss new requirements and promote compliance.

OBJECTIVE 5.4: Increase the use of publicity on a cooperative basis to increase incentives to comply and create a deterrence against noncompliance by:

5.4.1 Making the list of significant noncompliers, including Federal facilities, available each quarter for publication in available newsletters and local media.

OBJECTIVE 5.5: Improve public access to compliance information for all Chesapeake Bay dischargers through:

5.5.1 Improvement of public access by EPA to the national computer database, the Permit Compliance System (PCS).

5.5.2 Periodic meetings with EPA, the States and citizens to discuss compliance monitoring and enforcement.

20.1 PROGRESS REPORT ON THE DoD/EPA AGREEMENT ON THE CHESAPEAKE BAY

20.1 PROGRESS REPORT ON THE DoD/EPA AGREEMENT ON THE CHESAPEAKE BAY

Len Richardson, Director, Environmental Support Office, U.S. Department of Defense

The first DoD/EPA agreement concerning pollution prevention in the Chesapeake Bay was signed in September, 1984. DoD agreed to develop and initiate a pilot environmental program. This program included a study at 66 installations to determine the relative impacts of their activities on the Chesapeake Bay. The study was completed in 1987 for a total cost of $570,000.

Results indicated that DoD was not a major contributor of pollution in the Bay. Mr. Richardson noted that the DoD manages less than 1% of the bay land area adjacent to the Bay. The study also concluded that significant reductions at DoD facilities have been achieved.

A second agreement between DoD and EPA was signed in December of 1987. This agreement went beyond the 1984 agreement and established specific commitments to achieve the overall goals of the Chesapeake Bay Program. One action taken by DoD was the development of federal facility implementation plans which included a computer tracking program for water quality management. DoD also agreed to undertake a more active role in Bay restoration. For example, one facility has been cultivating marshland along a tributary of the Bay.

The most recent Chesapeake Bay Agreement was signed on April 20th, 1990 by Secretary Cheney and the EPA. Findings of the 1987 water quality study were incorporated in addition to provisions for auditing, inspection and participation goals. Langley Air Force Base and Norfolk Navel Shipyard have been selected to serve as model facilities to demonstrate pollution prevention techniques.

21.1 THE TOXICS REDUCTION STRATEGY FOR THE CHESAPEAKE BAY

21.2 ATTACHMENTS

- Major Flowchart - Major Committees in the Chesapeake Bay Program
- Chesapeake Bay Toxics Program Timeline
- Chesapeake Bay Basinwide Toxics Reduction Strategy

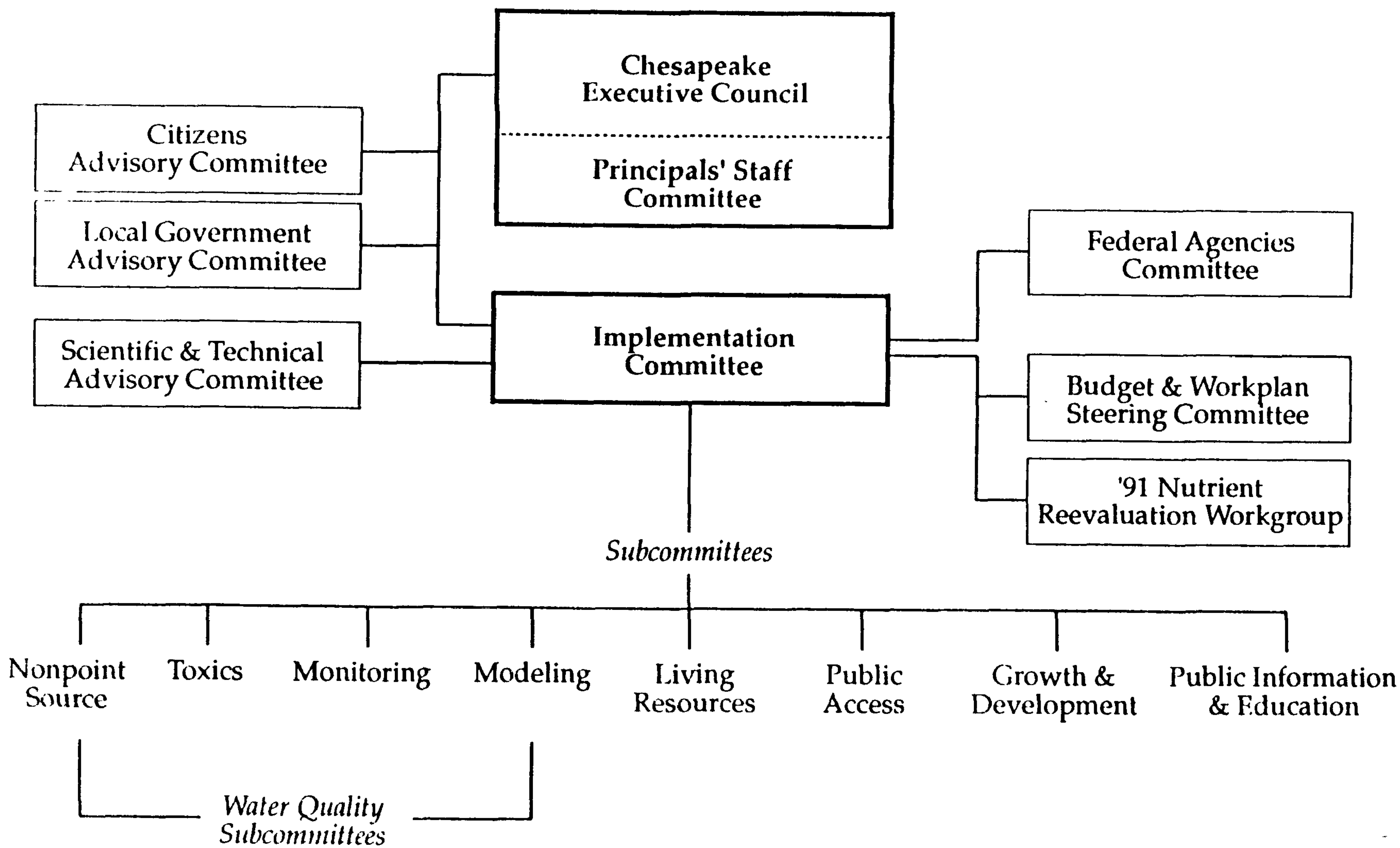
21.1 THE TOXICS REDUCTION STRATEGY FOR THE CHESAPEAKE BAY

Richard Batuik, Chesapeake Bay Liaison Office, EPA Region III.

This presentation focused on the toxic related issues in the Chesapeake Bay Program. The two goals that address the toxic issue in the Bay are 1) a toxic free bay by elimination of discharges from all controllable sources and 2) by the year 2000, reduction in the input of toxic substances to levels that would result in no toxic impacts on Bay wide resources.

Several strategies are being used to achieve these goals. First, it is necessary to define existing toxic impacts on the Bay and evaluate their stress on the system. Institutionalizing efforts are being made to reduce toxics and existing regulatory mandates continue to be expanded. As part of the *toxic reduction initiative*, a *toxics of concern* list based on risk assessments has been developed and a baseline toxics loading inventory has been conducted.

MAJOR COMMITTEES IN THE CHESAPEAKE BAY PROGRAM



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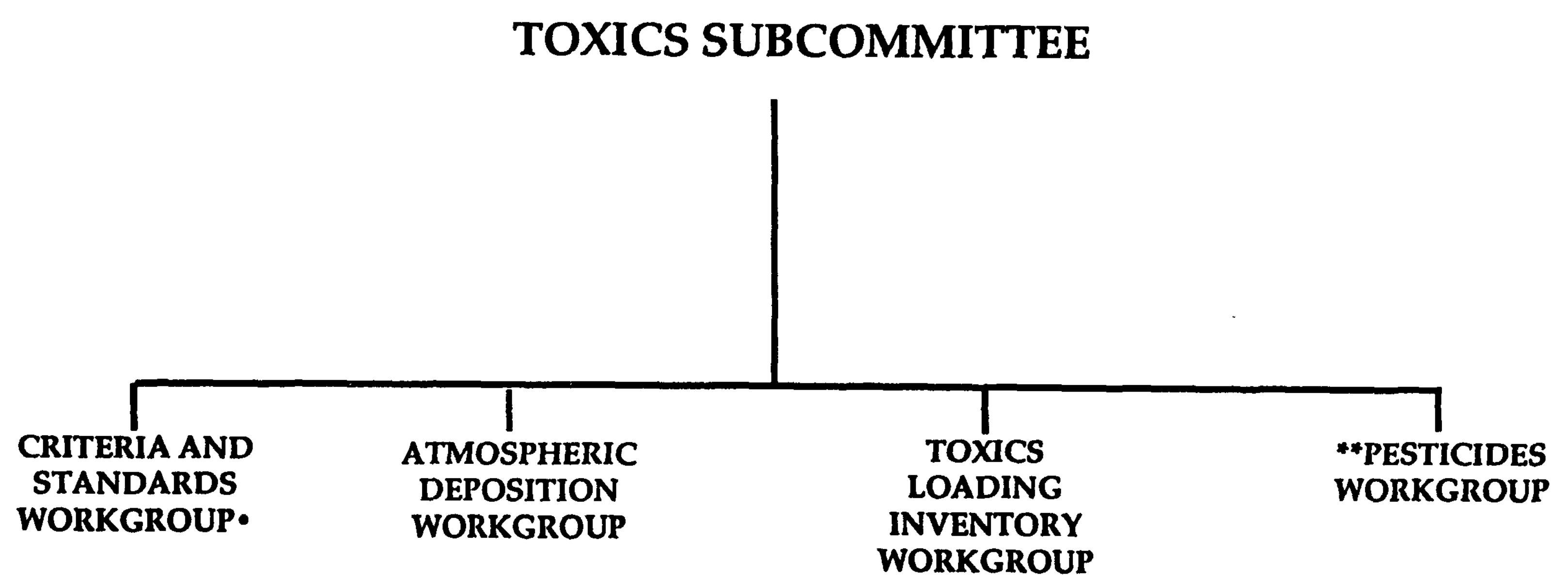


* Joint with Living Resources Subcommittee
**Joint with Nonpoint Subcommittee

CHESAPEAKE BAY
TOXICS PROGRAM TIMELINE

– Federal Facilities Perspective –

Chesapeake Bay Program - Research Phase: ***1978-1983***

Chesapeake Bay Agreement of 1983 signed: ***1983***

Chesapeake Bay Program - Implementation Phase: ***1984***

Chesapeake Bay Agreement of 1987 signed: ***Dec. 1987***

Basinwide Toxics Reduction Strategy adopted by the Chesapeake Executive Council: ***Dec. 1988***

Toxics Blue Ribbon Panel convened: ***March 1989***

Toxics Subcommittee convened for its first meeting: ***Sept. 1989***

Federal Facilities Compliance Initiative announced by EPA Administrator Reilly: ***Dec. 1989***

CHESAPEAKE BAY BASINWIDE TOXICS REDUCTION STRATEGY

– STRATEGY GOAL –

- **The long term goal of the this Strategy is to work towards a toxics free Bay by eliminating the discharge of toxic substances from all controllable sources.**

- **By the year 2000 the input of toxic substances from all controllable sources to the Chesapeake Bay will be reduced to levels that result in no toxic or bioaccumulative impacts on the living resources that inhabit the Bay or on human health.**

CHESAPEAKE BAY BASINWIDE TOXICS REDUCTION STRATEGY

– STRATEGY PRIORITIES –

- **Further definition of existing and potential Bay toxics issues and impacts.**

- **Institutionalizing coordinated efforts necessary for addressing toxics reduction issues and ultimately achieving the long term goal of a "toxics free" Chesapeake Bay.**

- **Building on existing legislative and regulatory mandates while taking advantage of innovative technologies to change the assessment, control, reduction and prevention of toxics loadings to the Bay.**

CHESAPEAKE BAY BASINWIDE TOXICS REDUCTION STRATEGY

– Major Commitments/Initiatives –

- **Chesapeake Bay Toxics of Concern**
- **Basinwide Toxics Loading Inventory**
- **Baywide Toxics Monitoring Program**
- **Chesapeake Bay Toxics Research Program**
- **Basinwide Integrated Pest Management**
- **Chesapeake Bay Toxics Critical Issues Forums**
- **System for Measuring Progress under the Strategy**
- **Chesapeake Bay Ecological Risk Assessment Framework for Toxics**

ROLE FOR FEDERAL FACILITIES IN IMPLEMENTATION OF THE BASINWIDE TOXICS REDUCTION STRATEGY

- More active participation in activities of the Toxics Subcommittee and its workgroups.

- Become key players in the building of institutional mechanisms for addressing and implementing toxics assessment, control, reduction and prevention issues and actions.

- Recognize leadership role in pursuing implementation of more innovative technologies for toxics reduction and prevention within the Bay basin.

- Beyond compliance, establish clear goals for further toxics reduction and prevention from Bay basin facilities.

- Share implementation experiences with other federal facilities, Bay basin states and local jurisdictions.

22.1 TOUR: EPA REGION III, CENTRAL REGIONAL LABORATORY AND DAVID TAYLOR RESEARCH CENTER

22.2 ATTACHMENTS

- Brochure - David Taylor Research Center
- Characteristics of Waste under RCRA

22.1 TOUR: EPA REGION III, CENTRAL REGIONAL LABORATORY AND DAVID TAYLOR RESEARCH CENTER

Tour Guide: Norman Fritsche

The tour of the central regional laboratory stressed the control of hazardous materials/wastes at CRL by tracing samples and chemicals from receipt in the lab through analysis to final disposal. The CRL tour included a brief review of laboratory facilities and analytical capabilities.

The second stop on the tour was the Navy's David Taylor Laboratory. The Lab has several projects involving improved management of wastes on ships that were described.

Annapolis

The Annapolis Laboratory is the former U.S. Naval Engineering Experiment Station, which was established in 1908 under the guidance of Rear Admiral George W. Melville. When the original mission to develop and test machinery prior to fleet use was expanded, the station was renamed the Marine Engineering Laboratory in 1963. The site became part of the Center in 1967 and now houses two major technical departments.

- The **Propulsion and Auxiliary Systems Department** performs research and develops and evaluates a variety of naval machinery. The Department addresses such areas as propulsion, auxiliary and electrical machinery components and systems: electrical and machinery systems integration; machinery dynamics and acoustic quieting; electric/magnetic quieting; ship automation and control; and shipboard energy availability and conservation.
- The **Ship Materials Engineering Department** conducts research and development in metals and alloys, corrosion, welding and fabrication, fuels and lubricants, coatings, elastomers and plastics, shipboard fire engineering, shipboard pollution abatement and advanced composites. Recent developments include high strength, low alloy steels, coatings for marine gas turbines, thermal spray coatings, anti-fouling organometallic coatings and aluminum anodes for shipboard cathodic protection. The Department also works on smoke control systems, fire extinguishing, fire resistant hydraulic fluids and other projects, like a steam injection disinfection system.

Primary facilities at Annapolis include Deep Ocean Pressure Tanks, a Pollution Abatement Laboratory, Submarine Fluid Dynamics Complex, and a Ship Silencing Facility.

Detachments

The Center's detachments provide a realistic environment for both model and full-scale trials. They include the Acoustic Research Detachment, Bayview, Idaho; the Acoustic Trials Detachment, Cape Canaveral, Florida; the Puget Sound Detachment, Bremerton, Washington; the Underwater Explosions Research Division, Portsmouth, Virginia; and the Surface Effects Ship Support Office, NAS, Patuxent River, Maryland.

Many Center projects involve several departments, particularly in the development of new classes of ships. And although specialized assistance is provided to the Maritime Administration and to the marine industry, direct support to the fleet is a primary concern.

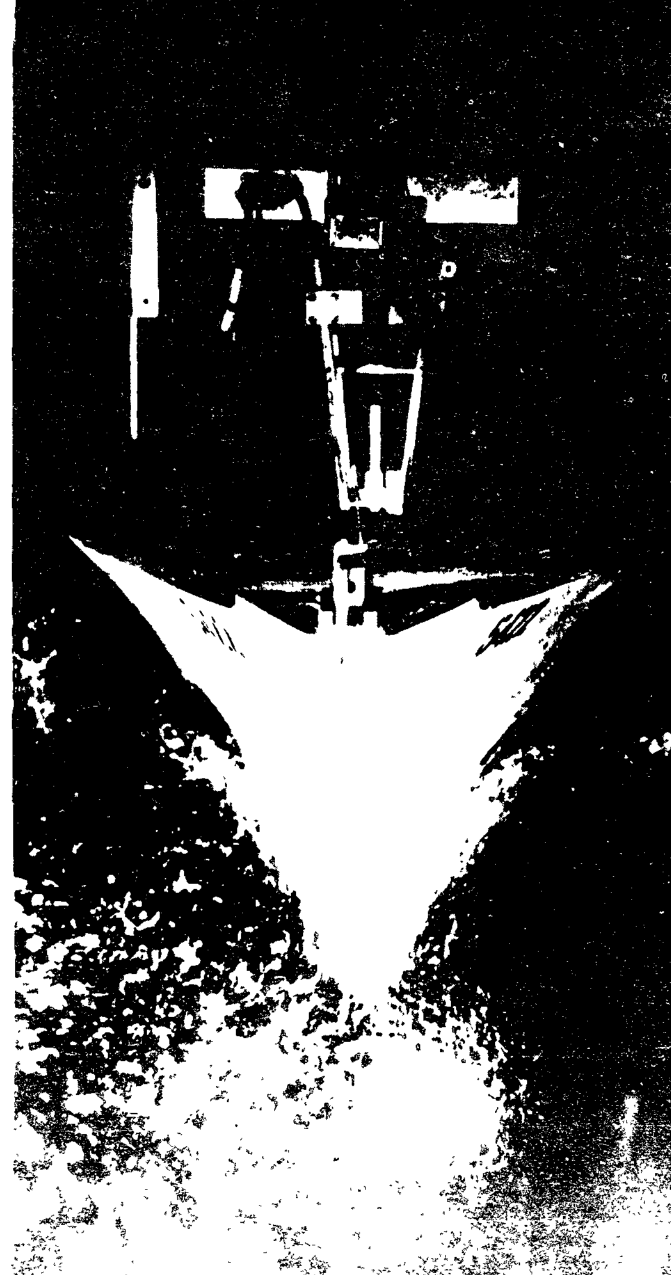
Research has resulted in the development of innovative ships, aircraft and subsystems, as well as improvements to existing platforms and components. These accomplishments are possible due to an excellent team of professional scientists and engineers, backed by superb facilities and support personnel.

APPROVED
Distribution Unlimited
for Public Release

Reviewed and approved February 1988

J P Kennedy

David Taylor Research Center



The David Taylor Research Center is the Navy's principal research, development, test and evaluation center for naval vehicles. Of primary concern are new vehicle concepts, ship and aircraft compatibility, ship trials, and the development of vehicle technology. Areas addressed include hull-form, structures, propulsion, silencing, maneuvering and seakeeping, auxiliary machinery, aerodynamics, pollution abatement, environmental effects, materials logistics research, computer techniques and software for analysis and design. The Center employs about 2800 civilians. Some 70 officers and enlisted men are assigned, primarily in detachments.

Carderock

The David Taylor Model Basin was named for the late Rear Admiral David W. Taylor, who first urged Congress to establish towing tanks in which to study scale models of ships before construction. The original model basin was built at the Washington Navy Yard in 1898 and was used for 40 years. The Navy's first wind tunnels occupied the same site.

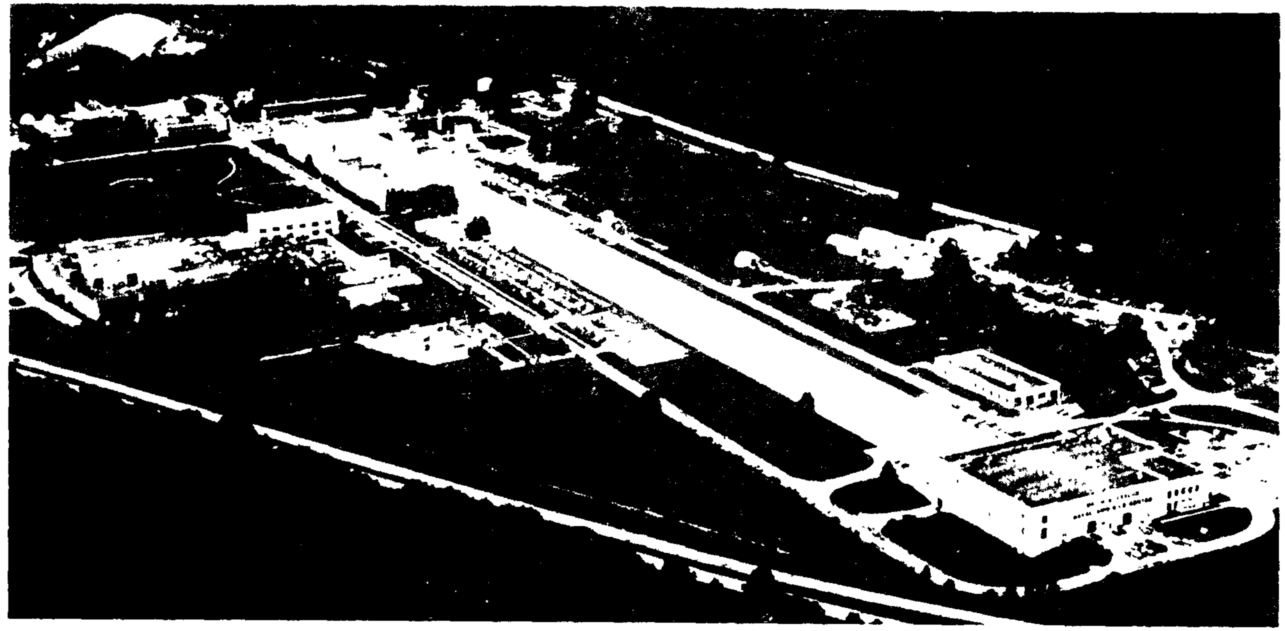
Operations at Carderock began in 1940 with a complex of towing tanks, still used today. With seven technical departments, the laboratory remains the largest facility of its kind in the Western World.

- The **Ship Systems Integration Department** provides the link between technology and full-scale development. It performs early stage ship design; plans and manages development of major subsystems and total vehicles; demonstrates operational feasibility with full-scale vehicles; and supports acquisition with design data and criteria as well as computer aids for ship design, military effectiveness evaluation and cost estimates.

- The **Ship Hydromechanics Department** conducts basic and applied research on hull forms and propulsors, providing the basis for new ship designs for the fleet. Models are evaluated in basins and tanks, where they are towed by carriages, moored or self-propelled at different speeds. The Department also provides extensive hydromechanics support to the fleet and operates two 165-foot converted patrol gunboats which are used to evaluate R&D products at sea.

- The **Aviation Department** provides wind tunnel support to Navy aircraft and weapon programs, and develops new vehicle concepts based on advanced aerodynamics technology. To ready the most promising concepts for full-scale development, the Department uses wind tunnels and towing tanks, flight tests and manned craft trials. Current projects include advanced rotorcraft, super-maneuverable aircraft and surface effect ships.

Cover: *Model of DDG-51 on Carriage I*



Carderock Laboratory

- The **Ship Electromagnetic Signatures Department** is responsible for research and development in electromagnetic signatures for Navy ships and their associated wakes. These efforts include electromagnetic theory, analytical models, countermeasure design and control techniques, scale-model measurements in Center laboratories, trials at sea, and signal and image processing development. Another major function is design engineering and instrument support for both Department and Center projects.

- The **Ship Structures and Protection Department** develops structural concepts and design analysis methods to ensure lighter, stronger, more reliable ships and submarines. The Department also determines the vulnerability of all types of naval ships and develops ways to protect them against combat threats and peacetime hazards. The effectiveness of antiship and ASW weapon warheads is appraised to support weapon design and deployment. Model and full-scale tests are conducted to confirm behavior; many of these are full-scale explosion trials at sea. The Department's Underwater Explosions Research Division is located at the Norfolk Naval Shipyard.

- The **Ship Acoustics Department** conducts research and development in underwater acoustics and ship vibrations, to ensure that ships, submarines, underwater weapons and other devices have satisfactory acoustic and vibration characteristics. Models are evaluated in an Anechoic Flow Facility at Carderock and at the Acoustic Research Detachment in Bayview, Id. The Department conducts full-scale trials in the Atlantic from MONOB, a floating laboratory home-based in Cape Canaveral, Fla.; and in the Pacific at Carr Inlet Acoustic Range, Fox Island, Wa., and on a range at Santa Cruz, Ca., the latter under the auspices of the Center's Puget Sound Detachment.

- The **Computation, Mathematics and Logistics Department** develops computer software and evaluates ADP technology. The results are used in a variety of Navy applications, including the theory of structures, numerical hydrodynamics, computer-aided design, manufacturing technology, computer-aided acquisition and logistics support, logistics, naval warfare analysis, and the design of information systems. In addition, the Department plans, develops and operates high speed computer systems for the Navy and other Department of Defense activities.

CHARACTERISTICS OF WASTE UNDER RCRA

Background

In 1976 Congress passed the Resource Conservation and Recovery Act (RCRA) which directed the U. S. Environmental Protection Agency (EPA) to develop and implement a program to protect human health and the environment from improper hazardous waste management. EPA first focused on large companies which generate the greatest portion of hazardous waste. In recent years, however, public attention has been drawn to the potential for environmental and health problems that may result from mismanaging even small quantities of hazardous waste. In November, 1984, the Hazardous and Solid Waste Amendments to RCRA were signed into law. With these amendments, Congress directed EPA to establish new requirements that would bring small quantity generators who generate between 100 and 1,000 kilograms of hazardous waste in a calendar month into the hazardous waste regulatory system. EPA issued final regulations for those 100 to 1,000 kg/month generators on March 24, 1986. Most of the requirements were made effective September 22, 1986.

A waste is any solid, liquid or contianed gaseous material that you no longer use, and either recycle, throw away, or store until you have enough to treat or dispose.

There are two ways a waste may be brought into the hazardous waste regulatory system: "listing", and identification through "characteristics" testing. Listed wastes appear on any one of the four lists of hazardous wastes contained in the RCRA regulations (40 CFR Part 260). These wastes have been listed because they either exhibit toxic constitutents that have been shown to be harmful to health and the environment. Characteristic wastes are those which are ignitable, corrosive, reactive or are EP toxic (40 CFR Part 260). Some wastes are considered to be "actuely hazardous".

These are wastes that EPA has determined to be so dangerous in small amounts that you may accumulate only 1 kg/month.

There are three categories of Hazardous Waste Generators:

1) generators of no more than 100 kg (conditionally exempt).

2) 100 to 1,000 kg (small quantity generators).

3) generators of 1,000 kg or more per month.

Each of the categories has its own regulations which are found in 40 CFR Part 260. The EPA facility must follow all state regulations first if they are more stringent than the federal guidelines. For example, Maryland small quantity generators are those who generate between 100 - 550 kg/month.

SAMPLE DISPOSAL FORM

Source:____

Program:_______________________________________

Analysis:______________________________________

Analyst:_______________ Date:__________________

Lab #	NON-Regulated Waste			Regulated Waste		
	Liquid	Solid	Oil	Liquid	Solid	Oil

LISTING OF CHEMICALS IN LOCATION 335

HEMICAL NAME MPANY NAME PURCHASE ORDER NUMBER	USER	STOCK NUMBER DATE ORDERED	ORDER # LOCATION	DATE RECVD. PACK LIST # LOT/SERIAL#	EXP.DATE DISCARD	HAZARD CARCIN	FLAM (Y/N)	IN STOCK (Y/N)	UNIT	SEC
1,5-DIPHENYLCARBOHYDRAZIDE POWDER J. T. BAKER CHEMICAL CO.	UNK	K620-03 08/01/87	1400 335	08/20/87 621718	/ /	N N	N	Y	25G	335
1,5-DIPHENYLCARBOHYDRAZIDE POWDER J. T. BAKER CHEMICAL CO.	UNK	K620-03 08/01/87	1400 335	08/20/87 621718	/ /	N N	N	Y	25G	335
1,5-DIPHENYLCARBOHYDRAZIDE POWDER J. T. BAKER CHEMICAL CO.	UNK	K620-03 / /	1402 335	/ / 346502	/ /	N N	N	Y	25G	335
2-ETHYL-HEXANOIC ACID KODAK CO.	UNK	P4442 11/01/83	1463 335	11/15/83 A13B	/ /	Y N	N	Y	500G	335
4-AMINOANTIPYRINE FISHER SCIENTIFIC 6PB-039-NNLX	UNK	O-1123 12/14/85	33 335	01/14/86 853083	/ /	N N	N	Y	100G	335
4-AMINOANTIPYRINE DAK CO.	UNK	6902 05/01/78	1403 335	05/10/78 BGF	/ /	N N	N	Y	100G	335
ALUMINUM OXIDE (ALUNDUM) THOMAS SCIENTIFIC 6PB-005-NNST	UNK	1590-D18 / /	1397 335	05/02/88 1344-28-1	/ /	Y N	N	Y	POUN D	335
ALUMINUM OXIDE (ALUNDUM) THOMAS SCIENTIFIC 6PB-005-NNST	UNK	1590-D18 / /	1397 335	05/02/88 1344-28-1	/ /	Y N	N	Y	POUN D	335
ALUMINUM OXIDE (ALUNDUM) THOMAS SCIENTIFIC 6PB-005-NNST	UNK	1590-D18 / /	1397 335	05/02/88 1344-28-1	/ /	Y N	N	Y	POUN D	335
ALUMINUM REF STD CONOSTAN INC.	UNK	AL 08/01/83	1427 335	08/10/83 5026	/ /	N N	N	Y	2 OZ	335
AMMONIUM FLUORIDE FISHER SCIENTIFIC 6PB-039-NNLX	UNK	A-665 06/01/72	5 335	06/15/72 726242	/ /	Y N	N	Y	453G	335
AMMONIUM OXALATE	UNK	A-679	13	06/19/86	/ /	Y	N	Y	453G	335

REVISED 6/13/89

CRL INVENTORY CONTROL SLIP

1. CHEMICAL NAME:______________________ DATE:__________

2. Stock #________________ Lot or Serial #______________

3. Chemical Destination:

   a. Empty(____) Expired(____) Move(____)

   b. New(____) Room #______ Date Ordered______________

   c. Removed from__________to__________(Room)

   d. Removed from__________to__________(Room)

4. Chemical Manufacturer or Supplier:

a.	Aldrich	____	i.	Fisher	____
b.	Arundel/Linde	____	j.	Supelco Inc.	____
c.	Baker	____	k.	Thomas	____
d.	Burdick & Jackson	____	l.	Matheson	____
e.	Chem. Services	____	m.	Mallinckrodt	____
f.	Daigger	____	n.	Roberts	____
g.	Eastman	____	o.	Other (please specify)	
h.	Baxter	____		__________________	

5. Amount

	Basic Unit	Quantity		Basic Unit	Quantity
a. Pint	____	____	e. Liter	____	____
b. Gallon	____	____	f. Gram	____	____
c. Ounce	____	____	g. Kilogram	____	____
d. Pound	____	____	h. Cylinder	____	____
			i. Milliliter	____	____

6. Initials______________

APPENDIX A

List of Attendees

Federal Facilities Conference Attendees

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APPENDIX B

Survey Results

A106 SURVEY
RESULTS

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Department of Army
Department of Navy
Department of Defense
Federal Aviation Administration
Virginia National Guard
National Aeronautics and Space - Administration
Environmental Protection Agency
Department of Agriculture
Department of Energy
Defense Logistics Agency
Veterans Administration

Number of Respondents: 28

TRAINING

1. Have you had any training on A106? yes 57% no 36% N/A 7%

   a) If yes, what has your training consisted of? (Check as many as apply)
   [number of respondents selecting each training source; out of 28]

   7 handbook materials
   12 help from others familiar with the program
   6 training workshop on A106
   4 other (Computer program, A106 instructions, Completing project forms)

   3 no response

2. How would you rate your training? **Average: 4.6 (acceptable)**
   Selection by category:

6	8	2	1	11
(1-3) poor	(4-6) acceptable	(7-9) good	(10) exceptional	N/A

3. How would you improve A106 training?
   - Increase availability
   - Clarify forms and instructions
   - Supply a manual
   - Offer facility specific guidance

PROJECT REVIEW

4. How long have you been involved with the A106 process?
   _21%_ less than 1 year   _40%_ between 1 - 3 years
   _21%_ more than 3 years   _18%_ no response

5. How much time were you given to review projects?

   Selection by category:

9	4	3	4	8
1-2 weeks	3-4 weeks	> 1 month	?	No response

6. Is your Agency and office using A106 as a planning tool?
   Yes _61%_   No _32%_   No response _7%_

   If yes, what disincentives exist for you to use A106 as a planning tool?
   - Poor timing
   - A106 is a low priority
   - Headquarters makes adjustments
   - Insufficient training
   - Limited access to information
   - A106 doesn't apply to industrially funded projects

   If no, do you have any other system that helps you plan your agency's/facility's environmental needs?
   - Internal workplan/ budget system
   - Local budgeting
   - Pollution Control Reports
   - Annual facility audits
   - EPA enforcement initiatives

7. What feedback did you receive regarding the project? (Check as many as apply) [number of respondents selecting each feedback source; out of 28]

   _9_ Recommended needed project sheet
   _6_ Conversations with facility representative(s)
   _3_ Federal facility compliance agreement negotiation
   _3_ Other (from headquarters)
   _5_ No feedback
   _5_ No response

8. Do you know if the project was finally funded?
yes 57% no 11% ? 11% No response 21%

If yes, what was the final outcome (i.e. project was close to budget, time frame, etc.)?
- 2 projects: cost > budget
- 3 projects: variable

9. What do you think the goals of A106 are? (Check as many as apply)
[number of respondents selecting each goal as one of several; out of 28]

22 For budgeting purposes
21 For program planning
20 For compliance
19 For tracking purposes
15 For pollution control
1 Other (?)

1 No response

52% Chose 4 or more of the above
41% Chose 2-3 of the above
7% Chose 1 of the above

a) Have the goals been reached?
yes 36% no 46% ? 7% No response 11%

10. What areas would you improve in the A106 process? (Check as many as apply)
[number of respondents selecting each area; out of 28]

14 training
10 timing
10 budgeting
8 forms
4 review chain
4 other: - Computerization of A106
- Training publicity
- Direct Feedback

6 no response

BUDGETING

11. How effective is A106 in determining budget requirements for environmental projects? **Average: 5.5 (adequate)**

Selection by category:

3	7	6	1	11
(1-3) ineffective	(4-6) adequate	(7-9) effective	(10) very effective	N/A

12. Is a 2-year budget cycle compatible for funding projects necessary for compliance? yes 39% no 36% N/A 7% No response 18%

13. How would you improve the budgeting process?
- Make future projections
- Increase feedback
- Speed up the process
- Link A106 to Army 1391
- Use appropriated funds for all required projects
- Allot funding for newly identified projects
- Allot funding for environmental compliance
- Ensure use of funds on project "start" date
- Include daily budget in A106

OTHER RESOURCES

14. Did you use any additional resources to help you with A106 such as a computerized data system?
- Computerized data system
- EPA facilities
- Spreadsheets

15. What is the best way to obtain up-to-date A106 information?
- Computer file
- EPIC
- Internal Tracking System
- Installation updates
- Directly from EPA

16. Do you currently send projects to state agencies?
yes 11% no 78% ? 4% No response 7%

a) Do you think that state agencies should be involved?
yes 39% no 32% ? 7% No response 22%

17. Other comments?
- Original Forms should be supplied.
- A106 is time consuming with little benefits.
- A106 should not lead to enforcement actions because information is volunteered.
- A106 is focused on clean-up, not on prevention.

Federal Facilities Conference Evaluation
Summary of Results*

I. Workshops

The speakers for each workshop were rated on a scale from 1 (poor) to 5 (excellent). The following figures represent the average rating for each category.

TOPIC	PREPARED	HELD ATTENTION	UNDERSTOOD TOPIC
Pollution Prev. Program	4.2	4.0	4.3
Refresher course on TSCA PCB requirements	3.3	3.2	3.5
New developments in CERCLA	4.3	4.0	4.4
New drinking water requirements	4.5	4.1	4.4
Spill prevention and response	4.3	4.1	4.5
UST compliance	4.5	4.2	4.3
Asbsestos/ NESHAPS	4.3	4.2	4.3

COMMENTS:

Offer workshops more than once... Presentations lacked detailed information... Too general... Provide more information on SDWA standards for community systems... New Clean Air Act requirements were not addressed... Allow more time for discussion.

Excellent handouts...Handouts of slides and presentation notes would be helpful...Overheads were not ledgeable...Not all acronyms were understood... Some speakers lacked sufficient knowledge of RCRA and TSCA requirements.

Well organized overall.

** 66 Conference attendees completed the Conference Evaluation.*

II. Questions and Answers:

1. Were you satisfied with the accommodations provided by the Ramada Inn?

   Yes.... 88% No... 12%

2. Please make suggestions for future conference locations:

   Annapolis, MD, Williamsburg, VA, Washington, D.C., Philadelphia, PA, Baltimore, MD, Richmond, VA.

3a. Was the tour well organized?

   Yes... 92% No... 8%

b. Was the content of the tour appropriate?

   Yes... 92% No... 8%

c. Comments:

   Provide a briefing on the lab before the walking tour...Spend more time on the lab processes and inspection procedures...Tour was very enjoyable.

4a. Did the Pollution Prevention presentation enhance your knowledge of this new strategy in any way?

   Yes... 94% No... 6%

b. Would you be interested in receiving more information on the subject in the future?

   Yes... 96% No... 4%

c. Comments:

   Excellent... Very important... Offered new and pragmatic ideas... Include in future agenda... Not aware an Act was passed... Too general... Need more information on alternative materials, waste stream analysis, and EPA requirements for federal facilities... Pollution prevention programs are desirable but funds are limited.

5a. Did you like the opportunity to choose among several activities(e.g. different workshops, tour vs. strategy working session)?

   Yes... 90% No... 10%

b. How would you like to see workshops scheduled in the future?

   Grouped... 61% Individually... 39%

c. Comments:

   Offer workshops more than once... Offer only two courses per group... Provide an opportunity to interface with the speakers... Offer evening discussion groups... Maintain original schedule of workshops... Provide more handouts.

6. How would you rate the overall preparation and presentation of the conference by EPA? (scale: 1=poor, 5=excellent)

Rating: 4.1

7a. Would you like to see more panel discussions at future events?

Yes... 82% No... 18%

b. Comments:

Taylor and Williams gave pertinent and informative talks; they were excellent.

8. Did you prefer panel sessions on...

Regulations/technology review only?	8%
Discussion of issues only?	2%
Both of the above?	90%

9. If you were running the conference next year, what changes (if any) would you make in order to achieve the best possible results?

Improve registration procedures... Preregistered attendees would get preference... Mail agenda three months before conference... Provide an attendance list in advance... Reduce session time to 50 minutes... Begin earlier and end earlier... Shorten breaks... Provide tables.

Offer most popular workshops more than once... Have more speakers, fewer workshops... Present keynote address first... Invite more installation commanders and allot them more time during panel discussions... Encourage participation from non-DOD facilities and state program experts... Offer more breakout sessions.

Give presentations on successful clean-up operations... Provide information on state priorities... Provide handouts of slide presentations and overheads... Improve the quality of overheads... Provide "Yellow", "Red", "Blue", and "Purple" books to new facility personnel... Continue to emphasize organization and management... Extend conference to five days.

10. Do you have any suggestions for agenda topics at future conferences?

Stormwater Regulations and Management
Sewage Sludge Regulations
Permit Writing
Waste Minimization
Community Pollution Prevention Program Model
Media/ Public Awareness of Environmental Issues

New Hazardous Ranking system
New Remedial Technology and Technology Transfer
New Clean Air Act
RCRA Laboratory Waste Regulations/Solutions
Compliance Tracking (EPA and State levels)
Multi-media Audits

Managing and Organizing an effective facility Environmental Office
Integration of the NEPA Process with Substantive Compliance
NEPA/CERCLA Integration
RCRA/CERCLA Integration
Household Hazardous Waste Identification
Impact of GSA Facilities on the Bay

RCRA Reauthorization
Non-point Source Pollution Control
Federal Facilities with Laboratories (NIH, FDA, DA)
Compliance Strategy
"Lessons Learned and Change Required"
Results and Trends in Compliance and Regulation
Panel Discussion on the Formulation of Regulations