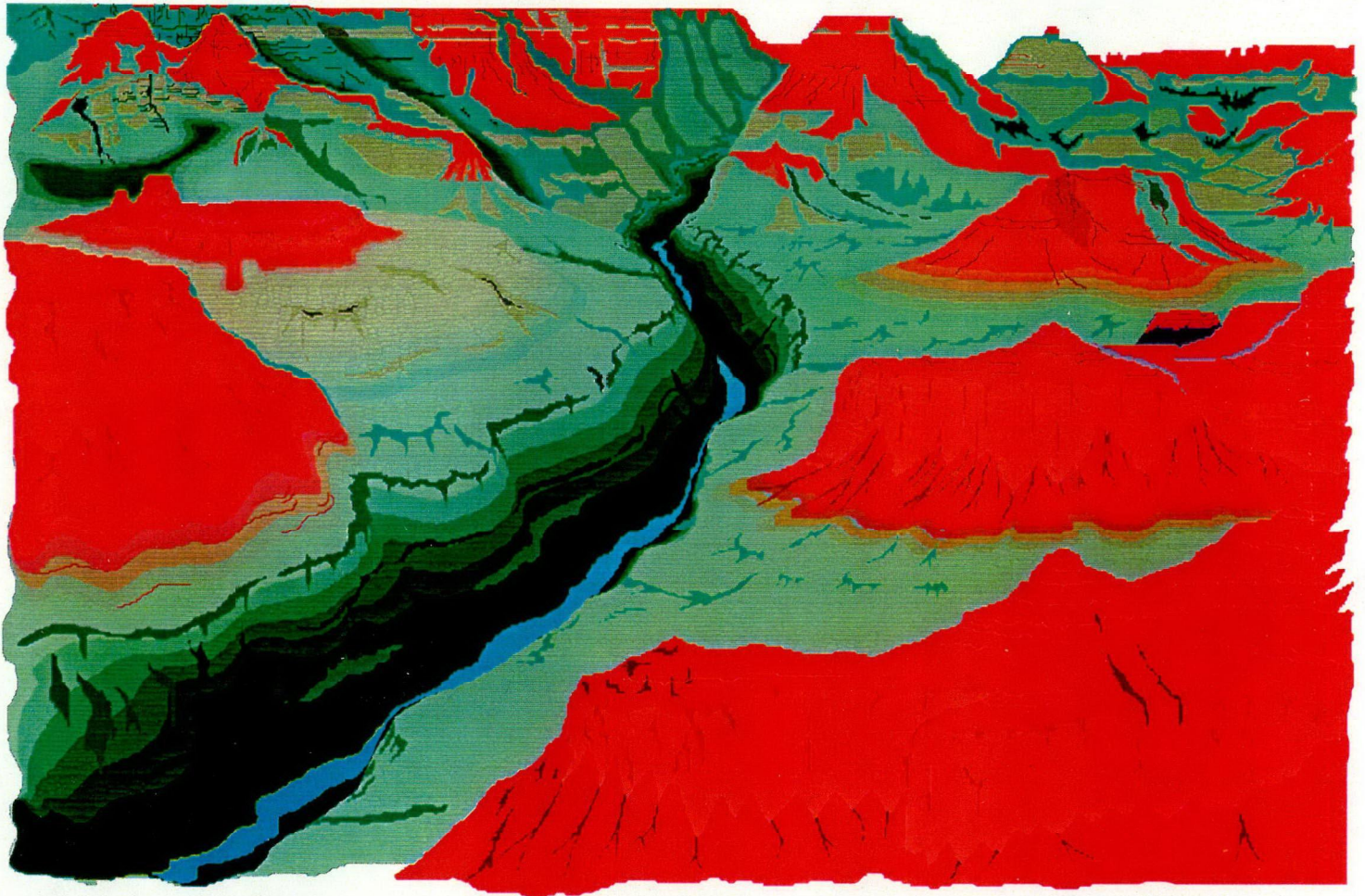


# NATIONAL PARK SERVICE ENVIRONMENTAL RESOURCE MANUAL



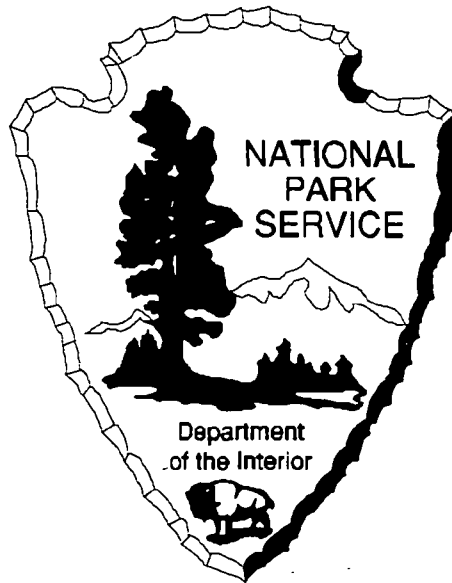
## Resource Manual for Environmental Management



Environmental Protection Agency Region VIII  
NPS Intermountain Field Area Office  
Partnership Project



# National Park Service Environmental Resource Manual



## Resource Manual for Environmental Management

*prepared for*  
EPA/NPS Partnership Project

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Office of Pollution Prevention  
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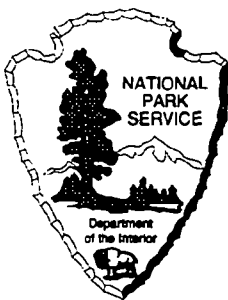
~~October 28, 1996~~  
April 16, 1997

“...Federal facilities will set the example for the rest of the country and become the leader in applying pollution prevention to daily operations, purchasing decisions and policies.... By stopping pollution at its source, the Federal government can make a significant contribution to protecting the public health and our environment.”

President Clinton

**Pollution prevention can be  
successful only with the  
commitment of park  
managers and the  
participation of  
all employees  
!!!**

**Environmental Management for the U.S. National Park Service, A Tool Kit for  
Environmental Management, and its companion document, National Park Service  
Environmental Resource Manual are prepared for use by the National Park Service.**



**Pollution prevention pays...**







***Senior Management Goals...***

- Understand pollution prevention concept
- Embrace it as the core of all management/environmental decisions
- Develop full support from all employees

The information contained herein is believed to be accurate and reliable at the time of printing. Neither the authors, publisher, technical advisors, nor those who may distribute this publication are to be held accountable for the suitability of recommendations or for the performance of a system design, product, or procedure in particular applications, and they will not be liable if possible levels of waste reduction are not achieved. Furthermore, reference to trade names or specific commercial products, commodities or services does not constitute an endorsement or recommendation. Readers should thoroughly investigate any design, procedure, or product and independently conclude suitability or satisfactory performance before purchase or use.

This document was originally prepared in part under a contract with the U.S. Environmental Protection Agency, Region VIII.

# **Acknowledgements**

## **Special Thanks to Yellowstone National Park**

This document is the result of the NPS/EPA Partnership Project. The idea for this project was first developed in 1992 during a cooperative pollution prevention effort with Yellowstone National Park. Due to the forward thinking of Tim Hudson, Chief of Maintenance for Yellowstone, EPA Region VIII was invited to work within the Park to understand their environmental needs and to develop the expertise needed to undertake this project. Without the support of Mr. Hudson and his staff, this entire effort would not have been possible.

## **Thanks to the Rocky Mountain and Colorado Plateau Staff**

The following individuals participated in the NPS/EPA Partnership training course "Pollution Prevention and Regulatory Compliance for the National Park Service." Their comments during the training were extremely valuable in defining the information needed in this manual. The authors of this document wish to acknowledge the contribution of Susan Garland, NPS Intermountain Field Area who coordinated the pollution prevention training sessions.

NPS personnel who made valuable contributions include Steve Ainslie, Marcelino Aldaz, Eddie Aragon, Clifford L. Arbogast, Jr., Michael Baker, Howard Bartley, Raymond Begay, Willie B. Begay, Fred Bolenske, Pam Bourgeois, Steve Budd-Jack, Erika Campos, Ron Clayborn, Chris Cline, Danny Cornell, Jim Dahlberg, William Dale, Frank Darcey, Michael J. Davin, Jackie DiMessen, Howard Dimont, Don Durbin, Shirley Fairbanks, Kathy Fiero, Phil Fillbright, Mindy Gallaher, Jeff Glanzer, Leonard Gonzales, Lou Good, Pat Goss, Richard Greenlee, Craig Hartlise, Bill Havland, Marylynn Heath, Steve Hunt, Marlene Igo, Kee Charlie John, Penny Jones, Guy Keene, John King, Robert H. King, Ted Koppenhafer, Jay Kratz, Gerald Lange, Larry L. Lewis, Timothy S. Lindsay, Judie Maserman, Tom Mason, Paul McCann, John McDill, Mike McGinnis, Mike McWright, Bill Miles, Jim Nepstad, Rick Nichols, Sue O'Conner, Jim O'Sickey, Tim Oliverius, Pierre Perney, Jim Perry, Doah Poolheco, Dan Resmondo, Don Robinson, Erin Rodieck, Bruce Rogers, Jed Simon, Terry Saunders, Dale Scheier, Dutch Scholten, Rick Shireman, Rande Simon, Tom Snorke, Dixie Sparks, Larry Stout, Frank L. Tafoya, Linda Towle, Gene Trujillo, Raymond Vialpando, Bruce Wadlington, Bill Wallner, Dave Walton, Bob Wemple, Don Whyte, Alan Williams, and Steven L. Willis.

In addition, a special thanks to the Front Range Community College students who conducted over 50 pollution prevention assessments of the Rocky Mountain and Colorado Plateau Cluster Parks: John DiCiacco, Avery Freeman, Janet L. Klein, Charlotte Plaut, and Barbara Wolf.

The authors gratefully acknowledge Marie Zanowick, U.S. Environmental Protection Agency Region VIII, for her insightful and valuable contributions to this document, without whose assistance and encouragement this document would not have been completed.

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***“It’s not easy being green.”***

Kermit the Frog,  
Sesame Street



## Using This Resource Manual

This Resource Manual was prepared for the use by national parks in the eight states of the National Park Service (NPS) Intermountain Field Area – Arizona, Colorado, Montana, New Mexico, Oklahoma, Texas, Utah, and Wyoming. It contains listing of the names, addresses, telephone and facsimile numbers, of equipment and product suppliers and service providers. These contacts may be of value as you search for the most economical and efficient means to minimize your wastes and properly care for those wastes that are unavoidable at this time. It also has provisions for you to add your own contacts if they are not listed. Each contact is listed with its principle area of coverage within the eight states. This document, and its companion publication discussed below, are the result of the Interagency Agreement between the NPS Intermountain Field Area and U.S. Environmental Protection Agency, Region VIII in the pursuit of the NPS Park Environment 2000 initiative.

### **Park Environment 2000**

The National Park Service is committed to the reduction and/or elimination of hazardous materials and wastes for all parks under its jurisdiction. To achieve this commitment, the NPS Intermountain Field Area developed an initiative entitled Park Environment 2000.

The goal of the Park Environment 2000 Initiative is to reduce or eliminate the generation of solid and hazardous wastes in every park, including any such wastes currently generated by park concessionaires.

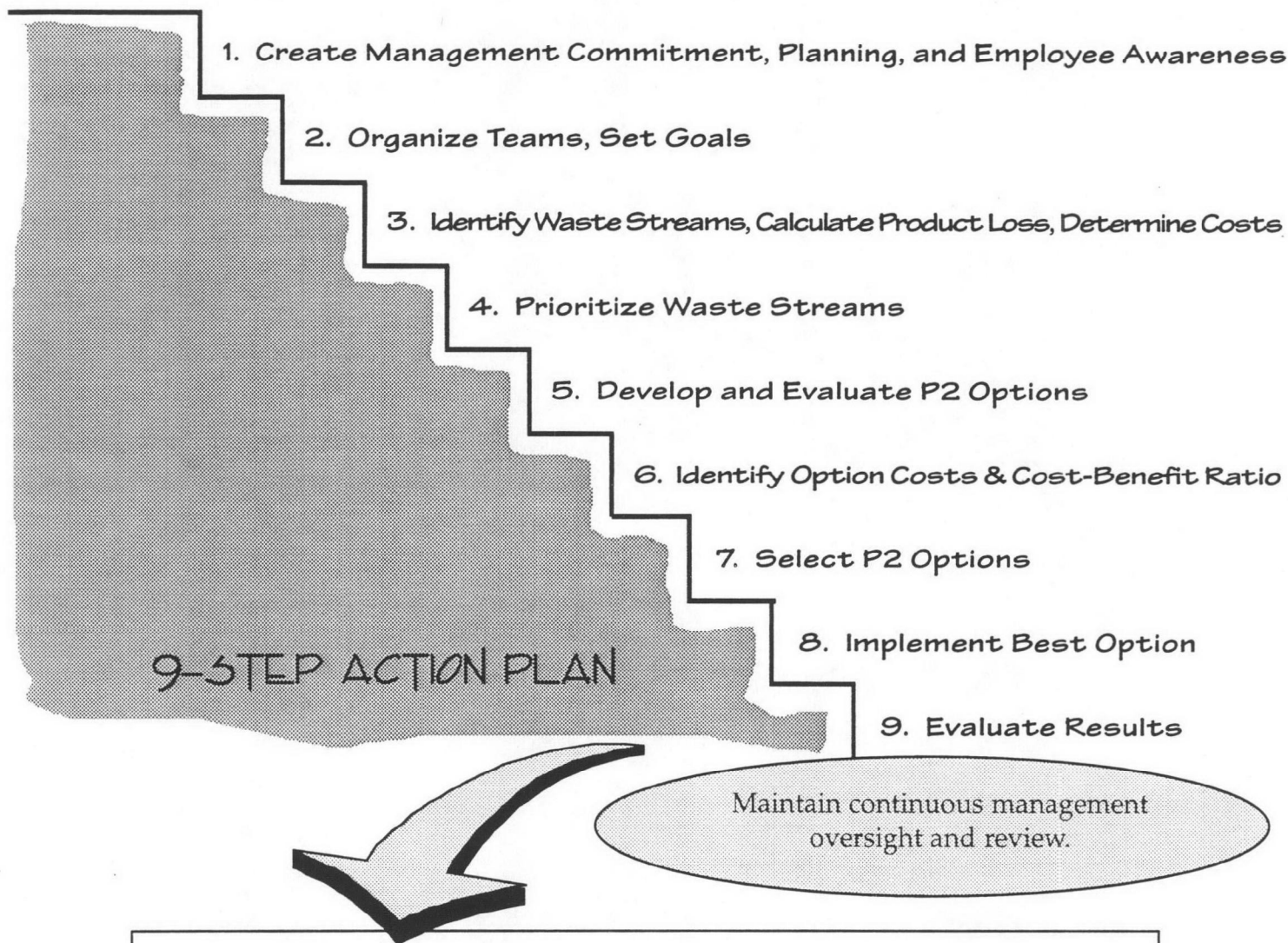
### **The NPS and the U.S. Environmental Protection Agency**

With Park Environment 2000 as the objective, there has been a concentrated effort to bring a new awareness to national park employees throughout the NPS Intermountain Field Area. This has included special training, park pollution prevention assessments, and a series of environmental management documents. This effort has been accomplished through an Interagency Agreement between the NPS and the EPA, Region VIII.

### **The NPS Intermountain Field Area Environmental Management Tool Kit**

As a part of the interagency agreement between NPS and EPA, an Environmental Management tool kit was developed around the most common wastestreams found at these parks. This tool kit describes each wastestream, identifies a series of possible ways to reduce or eliminate this wastestream, and presents an overall approach for the development of an on-going environmental management program. This tool kit is available to all parks and should be used as a companion to this resource manual.

## POLLUTION PREVENTION PROGRAM: ENVIRONMENTAL MANAGEMENT SYSTEM



The **9-Step Environmental Management System Action Plan** can be used to guide you through your **Park Environment 2000** activities. It is an organized sequence of actions that can be followed to ensure that you include everything you need to be successful. The first two steps are basic to your organization, regardless of the number and magnitude of waste streams. Steps three through nine are best tailored for each major waste stream, process, or subprocess. Feel free to shape these last steps in an iterative manner to avoid taking on too much. All nine steps ensure that you have a system in place for continuous oversight and improvement.



## **Environmental Contacts: Pollution Prevention and Compliance**

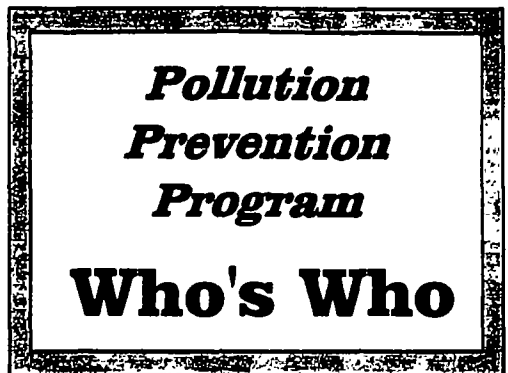
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1. Arizona Department of Environmental Quality (602) 207-4210  
Pollution Prevention Program
2. Colorado Pollution Prevention Coordinator  
Colorado Department of Public Health and the Environment (303) 692-3009
3. Montana Pollution Prevention Coordinator  
Montana State University Extension Service (406) 994-3451
4. New Mexico Pollution Prevention  
Hazardous Waste Bureau (505) 827-1557
5. Texas Office of Pollution Prevention and Conservation (512) 458-7111
6. Utah Pollution Prevention Coordinator  
Utah Department of Environmental Quality (801) 536-4477
7. Wyoming Pollution Prevention Coordinator  
Wyoming Department of Environmental Quality (307) 777-6105
8. Environmental Protection Agency, Region VI  
Pollution Prevention Program, Regional Office (214) 655-6444
9. Environmental Protection Agency, Region VIII  
Pollution Prevention Program (303) 312-6384
10. Environmental Protection Agency, Region IX (415) 744-2192  
Pollution Prevention Program (415) 744-2190
11. General Services Administration for Environmentally (800) 848-8928  
Preferable Products (206) 931-7109
12. CERCLA National Response Center (800) 424-8802
13. Resource Conservation and Recovery Act (RCRA) and  
Superfund Hotline (800) 424-9346





**Pollution Prevention Program (8P2-P2)**  
 Office of Pollution Prevention, State and Tribal Assistance  
 U.S. Environmental Protection Agency, Region 8  
 999 18th Street, Suite 500  
 Denver, Colorado 80202  
 (303) 312-6384  
 (303) 312-6741 fax



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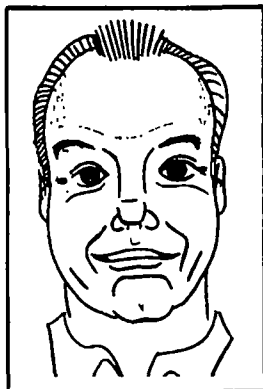
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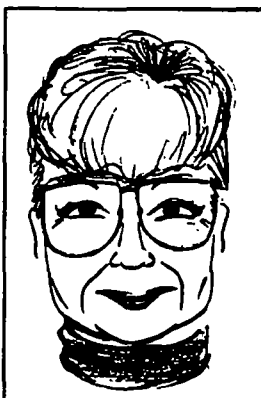
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- Display for Products Made with Recycled Content,
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**Marie B. Zanowick**  
(303) 312-6403

- Hazardous Waste Minimization,
- Mining Waste,
- Vehicle Maintenance,
- NPS/EPA Partnership Project,
- Wyoming Refinery

zanowick@csn.net

## U.S. Environmental Protection Agency Regional Offices

U.S. EPA, Region VI  
1445 Ross Avenue  
12th Floor, Suite 1200  
Dallas, Texas 75202-2733  
(214) 665-6444  
*New Mexico, Oklahoma, Texas*

U.S. EPA, Region VIII  
999 18th Street, Suite 500  
Denver, Colorado 80202-2466  
(303) 312-6312  
*Colorado, Montana, Utah, Wyoming*

U.S. EPA, Region IX  
75 Hawthorne Street  
San Francisco, California 94105  
(415) 744-1305  
*Arizona*



## State Hazardous Waste Management Agencies

### **Arizona**

Arizona Department of Health Services  
Office of Waste Programs  
3033 North Central Avenue  
Phoenix, Arizona 85012  
(602) 207-4108

### **Colorado**

Colorado Department of Public Health and Environment  
HMWMD-HWC-B2  
4300 Cherry Creek Drive, South  
Denver, Colorado 80222-1530  
(303) 692-3300

### **Montana**

Department of Health and Environmental Services  
Solid and Hazardous Waste Bureau  
Cogswell Building  
Helena, Montana 59620  
(406) 444-1430

### **New Mexico**

Environmental Improvement Division  
Hazardous Waste Bureau  
525 Camino De Loss Marquez  
Santa Fe, New Mexico 87501  
(505) 827-1557

**Oklahoma**

Department of Environmental Quality  
Hazardous Waste Quality Management Service  
1000 Northeast 10th Street  
Oklahoma City, Oklahoma 73117-1212  
(405) 271-5338

**Texas**

Industrial and Hazardous Waste Division  
Waste Evaluation Section  
Post Office Box 13087, Capitol Section  
1700 North Congress  
Austin, Texas 78711-3087  
(512) 908-6832

**Utah**

Department of Environmental Quality  
Division of Solid and Hazardous Waste  
Post Office Box 144880  
Salt Lake City, Utah 84114-4880  
(801) 538-6170

**Wyoming**

Wyoming Department of Environmental Quality  
Solid and Hazardous Waste Division  
122 West 25th Street  
Cheyenne, Wyoming 82002  
(307) 777-6105

## II. General Services Administration

### Environmental Products



The General Services Administration (GSA) offers many environmentally oriented products and services to the Federal sector. Various environmental laws, regulations and related executive orders have affected the number and range of these products and services. GSA's efforts, in concert with these directives, are aimed at minimizing waste, conserving energy and water, and preventing or reducing pollution. The GAS Supply Catalog contains over 3,000 environmental items and hundreds more are available through the Federal Supply and New Item Inventory Schedules and the Customer Supply Centers.

#### Recycled and Recycled Content Products

GSA offers over 1,000 recycled and recycled content products, including a variety of office and other paper supplies. The office items include bond, copier, writing and art/drafting papers, envelopes, notebooks, index cards, labels, calendars and file folders. Other items include toilet paper and paper towels, some of which are unbleached and contain 100% post consumer recovered materials, as well as recycled cardboard boxes and toner cartridges.

Also available in the system are rubber mats, thermal building insulation, and retread tires. Some newer items include recycled paint and shipping pallets and park benches and tables made from recycled plastic.

Where possible, buy recycled and recycled content products. Your actions help to close the loop on the entire process of recycling. GSA is striving to set the example in this area, by encouraging the collection of recyclable materials through the Federal Recycling Program, and by making available recycled items and items that contain recovered materials. In many cases, these products meet the mandate to buy recycled and recycled content products.

#### Energy Conservation

To conserve energy, GSA offers several items:

- Energy Efficient Household appliances, many in both gas and electric models including refrigerators, freezers, ranges, washers and dryers, dish washers, and window air conditioners.
- Lighting fixtures and controls.
- Motion and occupancy sensors which turn off lights when not being used.
- Energy management systems.
- Showerheads that provide fixed or variable restricted flow control for water conservation.
- Under the project name, Energy Star Computer Program, GSA makes computers and printers available that are designed to power down or "sleep" when not in use.

### **Paints and Chemicals**

In an effort to help prevent and reduce pollution, GSA has reformulated hundreds of its marine and architectural paints and coatings to eliminate or reduce harmful ingredients, such as: volatile organic compounds (VOCs); ozone depleting substances (ODS), chromate, mercury and lead. Water and citrus-based industrial cleaner and degreaser alternatives are offered as well.

### **Hazardous Waste**

To promote and improve environmental and public safety concerning the subject of hazardous materials, GSA offers products, equipment and services related to the recovery, recycling, and disposal of hazardous wastes.

### **GSA Federal Supply Service - Environmental Products Guide**

The Environmental Products Guide, prepared by the GSA Federal Supply Service, was designed to help Federal civilian and military agencies identify the environmentally oriented products and services available to them through their supply system. The guide contains more than 3,000 such items, with more than 1,000 of them employing recycled content paper products alone. Some of the items contain 100% postconsumer material (PM) and all applicable items meet or exceed guideline requirements established by the U.S. Environmental Protection Agency (EPA) and/or addressed in Executive Order 12873.

### **Defense Supply Center Richmond - Energy Efficient Lighting**

The Defense Supply Center Richmond (DSCR) has released its fourth energy efficient lighting catalog. The Energy Policy Act and Executive Order 12902, has mandated that from the base year of 1985, all Federal buildings must reduce energy consumption by 20% in the year 2000, and by a total of 30% in the year 2005. One of the largest energy uses in Federal buildings is lighting systems, which can be improved by installing energy efficient lighting. This catalog has numerous items that can be a part of your energy efficiency efforts in your overall pollution prevention program. It is also a great resource for technical information with cross-references from traditional lighting products to today's more efficient items.

### **Defense Supply Center Richmond - Environmental Products**

The DSCR has released a second edition of environmental products, including chemical alternatives, recyclers, aircraft cleaners, and much more. These products have been selected on the basis of their overall impact in reducing the use of regulated chemicals, thus reducing hazardous wastes, eliminating the use of ozone depleting chemicals, and of course protecting employees. Some of the more common substitutes found in this catalog are for methyl ethyl ketone (MEK), perchloroethylene (Perc), 1,1,1-trichloroethane (TCA), and trichloroethylene (TCE).



# General Services Administration

## Environmental Products

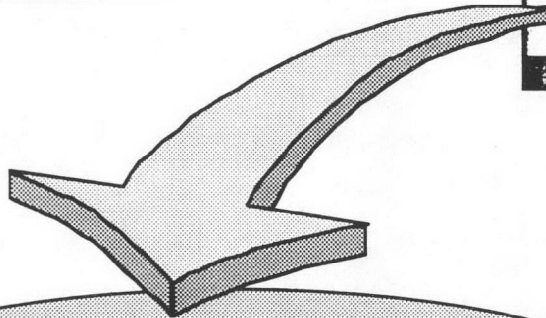
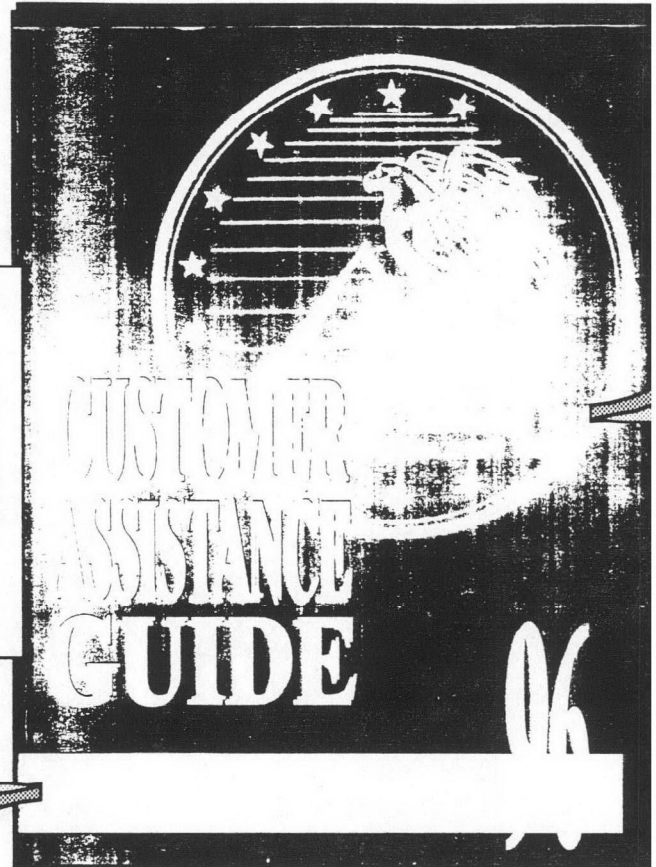
Customer Assistance Guide  
1996



### A Source of Environmental Products

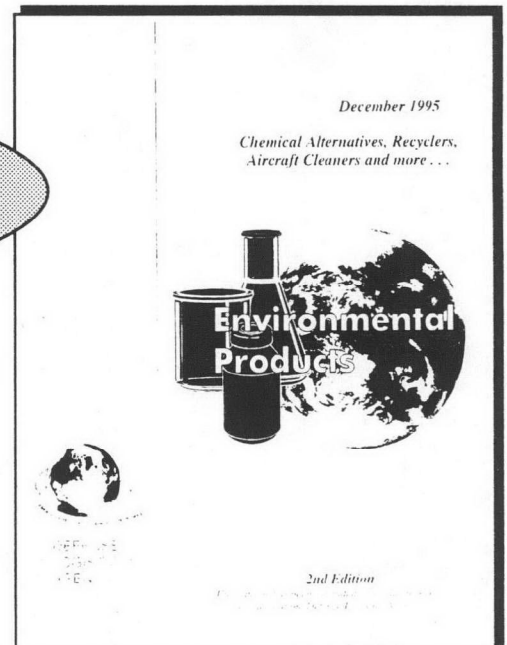
The General Service Administration (GSA), the Federal Supply System (FSS), and the Defense Supply Center Richmond (DSCR) are great sources of products that meet today's pollution prevention challenges. These products are available to Federal civilian and military agencies through their normal supply system.

Get This Catalog by Calling  
(703) 305-6477



**Environmental Products**  
Obtain your copy by calling DSCR at  
(616) 961-4958

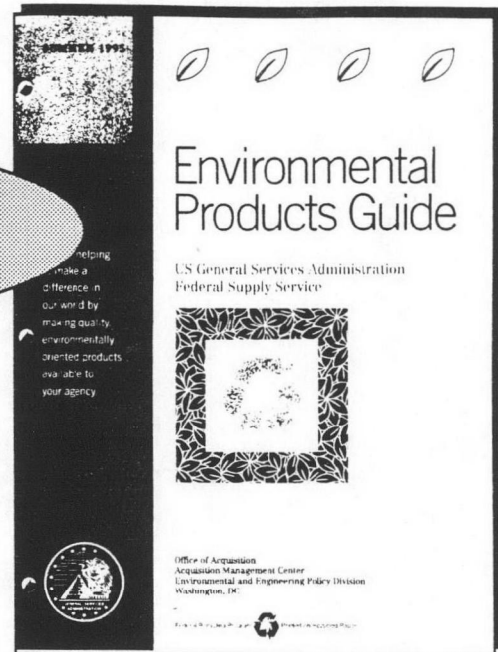
Environmental Products  
December 1995



Environmental Products Guide  
Summer 1995

**Environmental Products Guide**

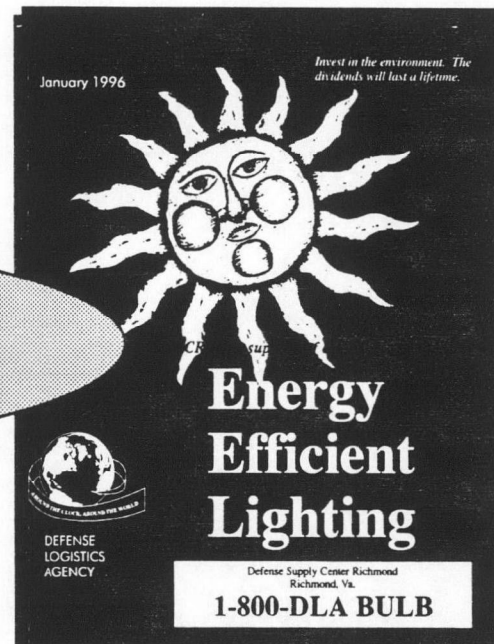
Obtain your copy by calling GSA at  
1-800-848-8928



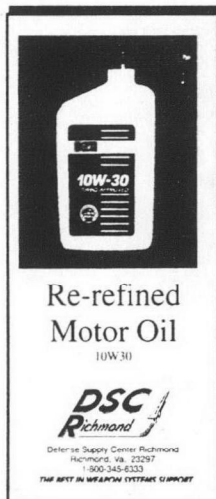
Customer Assistance Guide  
1996

**Energy Efficient Lighting**

Obtain your copy by calling DSCR at  
1-800-352-2858



Re-refined Motor Oil



**Re-refined Oils**

Obtain more information by calling DSCR at  
1-800-345-6333



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*...add your local contacts to the lists in the following pages as well.*

## **1. Air Cleaning and Purifying**

Air Sentry Dust Collectors  
460 East 76th Avenue  
Denver, Colorado  
(303) 458-8333

Air Treatment Systems, Incorporated  
4970 Monaco Boulevard, Unit C  
Commerce City, Colorado  
(303) 289-5936

American Medco  
111 West Evans Avenue  
Denver, Colorado  
(303) 934-6100

Honeywell Electronic Air Cleaners  
3901 Nome  
Denver, Colorado  
(303) 371-6463

## **2. Antifreeze Recycling Companies**

Note: These companies recycle antifreeze off-site.

### **A&I Distributors of Billings**

Billings, Montana 59101  
(406) 245-6443

### **Arrow Recycling**

Post Office Box 1676  
Mills, Wyoming 82644  
(307) 472-5543

### **ASAP Radiator**

Post Office Box 876  
Casper, Wyoming 82602

### **Gillette Radiator**

Post Office Box 1236  
Gillette, Wyoming 82717  
(307) 686-7622

### **Magnum Oil**

Butte, Montana  
(406) 782-8397

### **Oil Filter Company**

1410 SW 3rd Street  
Oklahoma City, Oklahoma 73108  
(405) 232-3411

### **Preferred Reduction Services**

977 South 700 West  
Salt Lake City, Utah 84101  
(801) 973-2220

### **Tri-State Recycling Services**

Post Office Box 790  
Newcastle, Wyoming 82701  
(1-800) 876-8645

### **3. Antifreeze Recyclers**

Note: These companies provide on-site recycler units.

FPPF  
117 West Tupper Street  
Buffalo, New York 14201-2193  
(1-800) 735-3773

Goodall Manufacturing Company  
7558 Washington Avenue South  
Eden Prairie, Minnesota 55344  
(1-800) 328-7730

Inesco  
1460 South 400 West  
Salt Lake City, Utah 84115  
(801) 487-4221

Kleer-Flo Company  
15151 Technology Drive  
Eden Prairie, Minnesota 55344  
(1-800) 328-7942  
(612) 934-7942 FAX

ROBINAIR  
Robinair Way  
Montpelier, Ohio 43543-0193  
(419) 485-5561

Industrial Air of Texas  
900 West Interstate 20  
Arlington, Texas 76017  
(817) 465-8545

## **4. Asbestos Abatement, Control, and Testing**

Asbestos Technology & Consulting

Boulder, Colorado  
(1-800) 732-7670

Havelick & Associates Ltd.

11925 Quay  
Broomfield, Colorado  
(303) 466-9305

ATS - Asbestos Transport System  
5780 Hooker  
Denver, Colorado  
(303) 433-0641

Mountain States Asbestos Removal  
7741 East Gray Road  
Scottsdale, Colorado  
(303) 951-9080



## **5. Automotive Refrigerant Reclamation Systems**

Major Diversities, Incorporated  
5601 Gray Street  
Arvada, Colorado 80020  
(303) 423-1391

Industrial Air of Texas  
900 West Interstate 20  
Arlington, Texas 76017  
(817) 465-8545

Matco Tools Corporation  
4403 Allen Road  
Stow, Ohio 44224  
(1-800) 331-2427

## **6. Battery Recycling**

Car-Go Batteries  
Denver, Colorado  
(303) 296-8763

Mercury Refining Company  
1-800-833-3505

Rocky Mountain Batteries  
Wheat Ridge, Colorado  
(303) 423-7142

Rechargeable Battery Recycling Corp.  
1-800-822-8837

INMETCO  
245 Porierville Road  
Ellwood City, Pennsylvania 16117  
(412) 758-2802

## **7. Cleaning Solvents and Parts Washers**

BioGenesis Enterprises, Incorporated  
2466 South 99th Street  
Milwaukee, Wisconsin 53227  
(414) 321-8509  
(414) 321-8609 FAX

Brody Chemical  
4825 South 6200 West  
Salt Lake City, Utah 84118  
(801) 963-2436

Chemcentral  
2465 South 1100 West  
Woods Cross, Utah 84087  
(801) 292-0437

Dychem International  
425 North 400 West  
Salt Lake City, Utah 84103  
(801) 292-0437

ETUS  
1511 Kastner Place  
Sanford, Florida 32771  
(407) 321-7910  
(407) 321-3098 FAX

Ecolink  
1094 Cudahy Place, Number 218  
San Diego, California 92110  
(619) 276-6476  
(619) 276-6479 FAX

Environmentally Safe Products Corporation  
2100 Road to Six Flags East  
Arlington, Texas 76011  
(817) 275-5533

Fremont Industries  
4400 Valley Industrial Boulevard, N  
Shakopee, Minnesota 55379  
(612) 445-4121  
(612) 496-3027 FAX

## **7. Cleaning Solvents and Parts Washers (cont)**

Heatbath Corporation  
Post Office Box 2978  
Springfield, Massachusetts 01102-2978  
(413) 513-3381

Inesco  
1460 South 400 West  
Salt Lake City, Utah 84115  
(801) 487-4221

Kleer-Flo Company  
15151 Technology Drive  
Eden Prairie, Minnesota 55344  
(1-800) 328-7942  
(612) 934-7942

Safety-Kleen Corporation  
880 East County Club Road  
Gering, Nebraska 69341  
(308) 436-2600

Solvent Kleene, Incorporated  
131 1/2 Lynnfield Street  
Peabody, Massachusetts 01960  
(508) 531-2279  
(508) 532-9304 FAX

TABCO  
940 West 100 South  
Salt Lake City, Utah 84104  
(801) 595-0119

TEXO Corporation  
2801 Highland Avenue  
Cincinnati, Ohio 45212  
(1-800) 998-8396  
(513) 731-8113 FAX

The Brulin Corporation  
Post Office Box 270  
Indianapolis, Indiana 46206  
(1-800) 776-7149

## **8. Drum & Drum Crusher Dealers**

Western Container  
Post Office Box 481063  
Denver, Colorado 80214-1063  
(303) 295-0404  
(303) 295-6232 FAX

Greif Brothers Corporation  
3963 Walnut Street  
Denver, Colorado 80205  
(303) 297-9901  
(303) 297-9907 FAX

S&G Enterprises, Incorporated  
14115 West 19000 Edison Drive  
Germantown, Wisconsin 53022  
(414) 251-8300

## **9. Energy Conservation and Management**

**E Source**  
1033 Walnut  
Boulder, Colorado  
(303) 440-8500

**Green Technologies, Incorporated**  
5490 Spine Road  
Boulder, Colorado  
(303) 581-9600

**Altresco, Incorporated**  
600 South Cherry  
Denver, Colorado  
(303) 320-8306

**Keplinger & Associates, Incorporated**  
1200 Milam Street  
Houston, Texas  
(303) 832-1602

- Note:
1. Also consider contacting your local Department of Energy Industrial Assessment Center (e.g., Colorado State University in Fort Collins, Colorado) for technical assistance in energy audits and energy conservation ideas.
  2. See GSA supply information (page 6) for listing of Greenlights companies and Defense Supply Center Richmond catalogs.

## **10. Hazardous Waste Disposal**

Van, Waters & Rogers Chem Care  
Post Office box 5287  
Denver, Colorado 80217-5287  
(303) 388-5651

Ashland Chemical, Incorporated  
9131 East 96th Avenue  
Englewood, Colorado 80110  
(303) 789-1887

World Environmental  
511 Orchard Street  
Golden, Colorado 80401  
(303) 271-3737

Allwaste Environmental Services  
15065 West 44th Avenue  
Denver, Colorado  
(303) 279-5506 or (303) 278-1858

Western Environmental Technologies,  
Inc.  
1800 West Littleton Boulevard  
Denver, Colorado  
(303) 795-2500

## 11. Industrial Laundries

G&K Services, Incorporated  
5100 Race Street  
Denver, Colorado 80216  
(303) 297-1533

American Industrial Service  
1850 South Acoma  
Denver, Colorado  
(303) 722-4661

American Linen  
5090 Cook  
Denver, Colorado  
(303) 295-7631

National Linen Service  
3850 Elm  
Denver, Colorado  
(303) 388-5391



## **12. Paint Solvents and Solvent Recovery Units**

### **Paint Solvents**

Ecolink  
1094 Cudahy Place, Number 218  
San Diego, California 92110  
(619) 276-6476  
(619) 276-6479 FAX

Painter's Supply Company  
3701 South Santa Fe Drive  
Sheridan, Colorado 80110  
(1-800) 275-2448

Solvent Kleene, Incorporated  
131 1/2 Lynnfield Street  
Peabody, Massachusetts 01960  
(508) 531-2279  
(508) 532-9304 FAX

### **Solvent Recovery Units**

Painter's Supply Company  
3701 South Santa Fe  
Sheridan, Colorado 80110  
(1-800) 275-2448

Solvent Kleene, Incorporated  
131 1/2 Lynnfield Street  
Peabody, Massachusetts 01960  
(508) 531-2279  
(508) 532-9304

## **13. Recycling Services**

Cornell Metal Recycling  
395 East Rogers Road  
Longmont, Colorado  
(303) 651-3493

Green Mountain Recycling Services  
Post Office Box 1096  
Boulder, Colorado  
(303) 442-7535

Arapahoe Resource Recovery  
7120 South Jordan Road  
Englewood, Colorado  
(303) 680-7533

BFI Recycling Systems  
5590 East 55th Avenue  
Commerce City, Colorado  
(303) 287-8040

Duwald Steel Corporation  
1100 Umatilla  
Denver, Colorado  
(303) 623-6238

Weyerhaeuser Paper Company  
5135 Race Court  
Denver, Colorado  
(303) 297-2312

Eco-Cycle  
5030 Pearl Street  
Boulder, Colorado 80304  
(303) 444-6634

Waste Management of Colorado  
2400 West Union Avenue  
Englewood, Colorado 80110  
(303) 797-1600  
(303) 794-2403 FAX

**Note:** Don't forget to call your state recycling coordinator for additional suggestions – you can reach them through your state's pollution prevention coordinator.

## **14. PCB Handling and Disposal**

### **Commercially Permitted PCB Incinerators (June 1993)**

Aptus, Incorporated  
Post Office Box 1328  
Coffeyville, Kansas 67337  
(316) 251-6380

Aptus, Incorporated  
Aragonite, Utah  
(801) 266-7787

Chemical Waste Management  
Post Office Box 2563  
Port Arthur, Texas 77643  
(409) 736-2821

Chemical Waste Management  
Environmental Energy Group  
Post Office Box 50764  
Denton, Texas 76206  
(817) 383-3632 or (817) 868-1291

### **Ballast Recycling Services**

Alta Resource Management Services, Inc.  
88-B Industry Avenue  
Springfield, Massachusetts 01104-9926  
1-800-730-2582 or (413) 734-3399

Dynex Environmental Incorporated  
6801 Industrial Loop  
Milwaukee, Wisconsin 53129  
1-800-249-3310 or (414) 421-4959

Eastern Environmental Technologies  
Portchester, New York  
(914) 934-2100

FulCircle Ballast Recyclers  
509 Manida Street  
Bronx, New York 10474  
1-800-581-0857  
(718) 328-4462 FAX

## **15. Storage Tanks**

Accutank Testing Corporation  
333 South Cherokee  
Denver, Colorado  
(303) 722-0700

Tank Disposal, Incorporated  
2090 East 104th Avenue  
Thornton, Colorado  
(303) 280-9734

Underground Storage Technology  
6794 Welch Court  
Arvada, Colorado  
(303) 4203603

Waste Engineering, Incorporated  
2430 Alcott Street  
Denver, Colorado  
(303) 433-2788

Enviro-Care Tank System  
2650 South Delaware Street  
Denver, Colorado 80223  
(1-800) 797-9974 or (303) 777-4122

JoaQuin Manufacturing Corporation  
6900 Elm Drive  
Commerce City, Colorado 80022-1844  
(1-800) 783-7060

## **16. Waste Oil Burning Furnaces and Heaters**

Clean Burn, Incorporated  
83 South Groffdale Road  
Leola, Pennsylvania 17540  
(1-800) 331-0183

INOV8, Incorporated  
1240 Clinton Street  
La Crosse, Wisconsin 54603  
(608) 785-2876

Inesco  
1460 South 400 West  
Salt Lake City, Utah 84115  
(801) 487-4221

Lanair  
2347 Kettering Street  
Janesville, Wisconsin 53546  
(1-800) 753-1601  
(608) 757-7878 FAX

Reznor  
1555 Lynnfield Road  
Memphis, Tennessee 38119  
(1-800) 695-1901

Shenandoah Manufacturing Company  
Post Office Box 839  
Harrisonburg, Virginia 22801-0839  
(1-800) 476-7436

## **17. Waste Oil Haulers**

A&H Services, Incorporated  
Post Office Box 722  
Mooreton, North Dakota 58061  
(701) 274-8816

Advanced Petroleum Recycling Co.  
Post Office Box 16747  
Salt Lake City, Utah 84116-0747  
(801) 364-9444

Approved Oil Service, Incorporated  
5390 East 72nd Avenue  
Commerce City, Colorado 80022  
(303) 287-2807

Area Pump and Re-Cycle  
124 Highway 200 South  
Glendive, Montana 59330  
(406) 365-3115

Asphalt Express, Incorporated  
Post Office Box 26453  
Salt Lake City, Utah 84126  
(801) 972-6033

Bennett's Economy Sanitation  
160 East Helm Avenue  
Salt Lake City, Utah 84115  
(801) 266-1559

Brand Precision Services, Incorporated  
6151 Executive Boulevard  
Huber Heights, Ohio 45424  
(513) 237-1097

Casper Radiator  
Post Office Box 325  
Mills, Wyoming 82644  
(307) 234-5764

## **17. Waste Oil Haulers (cont)**

Chemical Conservation Corporation  
653 Rocket Boulevard  
Orlando, Florida 32824  
(407) 859-4441

Dennis White Trucking, Incorporated  
11192 South Trent Drive  
South Jordan, Utah 84095  
(801) 576-0250

Erickson, Incorporated  
503 West 400 South  
Salt Lake City, Utah 84101  
(801) 359-6861

Evergreen Environmental Services  
6880 Smith Avenue  
Newark, California 94560  
(1-800) 972-5284  
(510) 791-0126 FAX

First Recovery  
200 Petro Avenue, Site B  
Sioux Falls, South Dakota 57117  
(1-800) 545-3520

Floyds of South Carolina, Incorporated  
Post Office Box 12318  
Florence, South Carolina 29504  
(803) 669-0192

Franks Vacuum Truck Service  
4500 Royal Avenue  
Niagara Falls, New York 14303  
(716) 284-2132

Fred Cheney  
7680 Goldstein Lane  
Bozeman, Montana 59715  
(406) 586-5067  
(406) 580-5067 FAX

## 17. Waste Oil Haulers (cont)

Freehold Cartage, Incorporated  
Post Office Box 5010  
Freehold, New Jersey 07728-5010  
(908) 462-1001

Golden Eagle Refinery, Incorporated  
1474 West 1500 South  
Woods Cross, Utah 84087  
(801) 298-8882

H&M Oil Corporation  
Post Office Box 215  
Pocatello, Idaho 83201-0215

Indian Oil  
4891 West 11000 North  
Highland, Utah 84003  
(801) 785-8522

LePier Oil Company, Incorporated  
320 East First Street  
Fosston, Minnesota 56542  
(218) 435-1040

Loes  
Post Office Box 156  
Mankoto, Minnesota 56001  
(507) 625-5278

Lund Oil, Incorporated  
Post Office Box 38  
Keene, North Dakota 58847  
(701) 675-2264

Mesa Oil  
14701 Broadway, SE  
Albuquerque, New Mexico 87105  
(1-800) 873-3645



## **17. Waste Oil Haulers (cont)**

Moore Oil, Incorporated  
Post Office Box 564  
Libby, Montana 59923  
(406) 827-4314

National Tank and Monitoring,  
Incorporated  
3856 West 5400 South  
Salt Lake City, Utah 84118  
(801) 967-2233

Northern Plains Transport  
Rural Route 1, Box 350  
Bismarck, North Dakota 58501  
(701) 258-5203

OSI Environmental, Incorporated  
104 South 15th Avenue  
Virginia, Minnesota 55792  
(218) 749-3060

Oil Enterprises, Incorporated  
Post Office box 278  
Midvale, Utah 84047  
(801) 255-5845

Oily Waste Processors  
Post Office Box 2903  
Great Falls, Montana 59403  
(406) 761-4503

Ozzies Drain Company  
Post Office Box 9289  
Missoula, Montana 59807  
(406) 543-7911

Petroleum Processors, Incorporated  
Post Office Box 1016  
American Fork, Utah 84003  
(801) 785-0106

## **17. Waste Oil Haulers (cont)**

R-Three, Incorporated  
1046 Johnson Lane  
Billings, Montana 59102  
(406) 323-3615

Thermo Fluids, Incorporated  
Post Office Box 1970  
Gilbert, Arizona 85299  
(1-800) 350-7565

Tri-State Oil Reclaimers  
Post Office Box 735  
Newcastle, Wyoming 82701  
(1-800) 876-8645



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## 1. What are Hazardous Wastes?

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 practices. The program is designed to control the management of hazardous waste from its generation to its ultimate disposal – from “cradle-to-grave.”

EPA first focused on large companies, which generate the greatest portion of hazardous waste. Business establishments producing less than 1,000 kilograms (2,200 pounds) of hazardous waste in a calendar month (known as small quantity generators) were exempted from most of the hazardous waste management regulations published by EPA in May of 1980.

In subsequent years, public attention focused on the potential for environmental and health problems that may result from mismanaging even small quantities of hazardous waste. For example, small amounts of hazardous waste dumped on the land may seep into the earth and contaminate underground water that supplies drinking water wells.

In November of 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 these 100 to 1,000 kilograms per month generators on March 24, 1986. Most of the requirements were effective September 22, 1986.

More recently, on May 11, 1995, the EPA put the *Universal Waste Rule* into effect. This designates certain wastes shippable without manifests. It is designed to help recycling efforts. Some States have adopted and expanded on this Rule. Parks should check with their State for the local application of the Universal Waste Rule. EPA Region VIII can provide answers in this area through their RCRA Program: (303) 312-6045 or (303) 312-6525.

### What is a Hazardous Waste?

A waste is any solid, liquid, or contained gaseous material that you no longer use, and either recycle, throw away, or store until you have enough to treat or dispose.

As a result of operations, a park may generate wastes that can cause serious problems if not handled and disposed of carefully. Such wastes could cause injury or death, or damage or pollute land, air, or water. These wastes are considered hazardous, and they are currently regulated by federal and state public health and environmental safety laws.

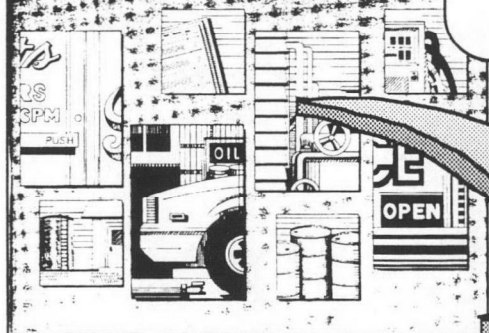
There are two ways a waste may be brought into the hazardous waste regulatory system: listing, and identification through characteristics.

**Understanding the Small Quantity  
Generator Hazardous Waste Rules: A  
Handbook for Small Business**

**EPA / 530-SW-86-019**

Call your regional EPA  
office, state hazardous  
waste office, or

RCRA/Superfund  
Industry Assistance  
Hotline  
1-800-424-9346



This document has great information on how  
to determine if your waste is hazardous,  
what you should do, and how to do it.

Contact your regional EPA  
office or the designated  
state office for additional  
information on obtaining  
this document.

(see contact section of this  
resource manual)



**For a list of vehicle maintenance  
products that may contain hazardous  
materials, see page 69!**

**Listed wastes:** Your waste is considered hazardous if it appears on any one of the four lists of hazardous wastes contained in the RCRA regulations. These wastes have been listed because they either exhibit one of the characteristics described below or contain any number of toxic constituents that have been shown to be harmful to health and the environment. The regulations list over 400 hazardous wastes, including wastes derived from manufacturing processes and discarded commercial chemical products.

**Characteristic wastes:** Even if a waste does not appear on one of the EPA lists, it is considered hazardous if it has one or more of the following characteristics:

- It is easily combustible or flammable; this is called ignitable waste. If your waste has a flashpoint of 140°F or lower, it is defined as an ignitable hazardous waste. Examples are paint wastes, certain degreasers, and many solvents.
- It dissolves metals, other materials, or burns the skin. This is called a *corrosive* waste. If your waste has a pH of less than or equal to 2.0, or greater than or equal to 12.5, your waste is a corrosive hazardous waste. Examples are waste rust removers, waste acid or alkaline cleaning fluids, and waste battery acid.
- It is unstable or undergoes rapid or violent chemical reaction with water or other materials. This is called *reactive* waste. Examples are cyanide plating wastes, waste bleaches, and other waste oxidizers.
- A waste sample is tested and shows EP (extraction procedure) toxicity. Wastes are *EP toxic* if an extract from the waste is tested and found to contain high concentrations of heavy metals (such as mercury, cadmium, or lead) or specific pesticides that could be released into the ground water.

You may generate other wastes beyond the examples mentioned above. It is your responsibility to determine whether your wastes are hazardous. If you need assistance, call one of the following sources in information:

- Your state hazardous waste management agency.
- Your EPA regional office.
- The RCRA/Superfund Hotline: 1-800-424-9346.
- EPA's Small Business Ombudsman Hotline: 1-800-368-5888

### **Categories of Hazardous Waste Generators**

Since the 1986 amendments, there have been three categories of hazardous waste generators:

- The **Conditionally Exempt Small Quantity Generator** (CESQG) who generates no more than 100 kilograms (220 pounds) of hazardous waste per month;
- The **Small Quantity Generator** (SQG) who generates 100 to 1,000 kilograms (220 to 2,200 pounds) of hazardous waste per month; and
- The **Large Quantity Generator** (LQG) who generates 1,000 kilograms (2,200 pounds) or more hazardous waste per month.

To determine which category of hazardous waste generator you fall into, and which requirements you must meet, you must measure, or “count” the hazardous waste you generate in a calendar month. In general, you must add up the weight of all hazardous wastes you generated in that month, and the total weight will determine your category. Remember, you are the one responsible for determining which of your wastes are hazardous, and for keeping records to know your generator size. If you use a laboratory analysis to determine if a waste is hazardous, keep the laboratory analysis report as a part of your environmental records.

### **Acutely Hazardous Wastes**

Some wastes are considered to be acutely hazardous. These are wastes that EPA has determined to be so dangerous in small amounts that they are regulated the same way as are large amounts of other hazardous wastes. Acutely hazardous wastes, for example, may be generated when using certain pesticides. They also include dioxin-containing wastes.

If you generate more than 1 kilogram (2.2 pounds) of acutely hazardous wastes in a calendar month or store more than that amount for any period of time, you are subject to all the regulations that apply to generators that generate more than 1,000 kilograms of hazardous waste per calendar month (Large Quantity Generator).

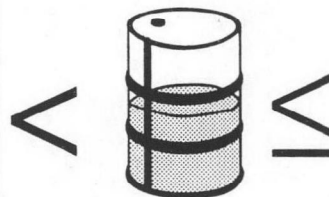
<p>1 kilogram = 2.2 pounds 100 kilograms = 220 pounds 1,000 kilograms = 2,200 pounds</p>
--------------------------------------------------------------------------------------------------

<p>55-gallon drum approximately 200 kilograms 55-gallon drum approximately 440 pounds</p>
-----------------------------------------------------------------------------------------------



**Conditionally Exempt Small Quantity Generator**

Less than 100 kilograms (220 pounds),  
one-half 55-gallon drum (approximately)  
per calendar month, or  
1 kilogram (2.2 pounds) or more per month of acutely  
hazardous waste



**You must determine if your waste is hazardous, and if it is, you are responsible for it for 30 years, regardless of what you do with it!**

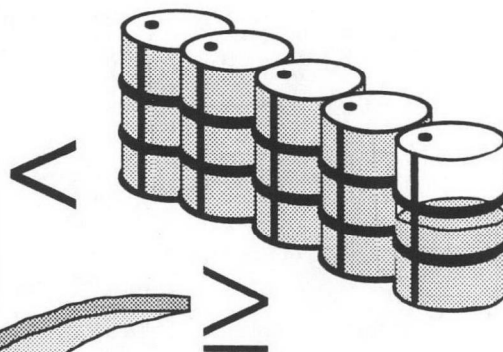
**Your Waste is Hazardous if...**

...it is a **listed waste** - one of over 400 wastes listed by EPA

...it is characteristic - demonstrates specific characteristics

***Small Quantity Generator***

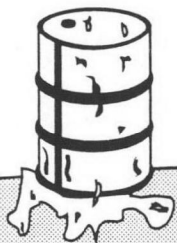
More than 100 kilograms (220 pounds), but less than 1,000 kilograms (2,200 pounds),  
four and one-half 55-gallon drums (approximately)  
per calendar month, or  
1 kilogram (2.2 pounds) or more per month of acutely  
hazardous waste

***Large Quantity Generator***

1,000 kilograms (2,200 pounds) or more,  
four and one-half 55-gallon drums (approximately)  
per calendar month, or  
1 kilogram (2.2 pounds) or more per month of acutely  
hazardous waste

**Ignitable**

Flash Point  $\leq 140^{\circ}\text{F}$

**Corrosive**

$\text{pH} \leq 2$  or  $\text{pH} \geq 12.5$

**Reactive**

Violently reacts with  
water or other materials

**Toxic**

Contains heavy metals or  
certain pesticides

**Characteristic Waste**

## 2. Toxicity Characteristic Leaching Procedure

On March 29, 1990, the U.S. Environmental Protection Agency (EPA) promulgated a rule to revise the existing toxicity characteristics which are used to identify those wastes which are hazardous and thus subject to regulation under Subtitle C of the Resource Conservation and Recovery Act (RCRA). This rule added 25 constituents to the list of eight metals, four pesticides, and two herbicides already regulated under Subtitle C of RCRA (see included table for complete list of constituents). The rule also replaced the Extraction Procedure (EP) Toxicity Characteristic with a more comprehensive testing procedure known as the Toxicity Characteristic Leaching Procedure (TCLP) or Method 1311 (55 FR 11798) as mandated in the Hazardous and Solid Waste Amendments of 1984 (HSWA). The TCLP is used to measure the mobility of both organic and inorganic contaminants and the allowed maximum concentrations in milligrams per liter (mg/L).

### **TCLP and Extraction Procedure (EP)**

The major differences between the EP procedure and the TCLP procedure include:

- TCLP uses an extraction fluid based on the alkalinity of the sample.
- A "Zero-Headspace Extractor" is required for the extraction of volatile organic compounds from the sample under the TCLP procedure.
- The extraction time for the TCLP procedure is only 18 hours instead of 24 hours for the EP procedure.
- TCLP has a stricter quality assurance requirement.

The TCLP rule is in effect for large quantity generators [1,000 kilograms (2,200 pounds) or more per month] and took effect March 29, 1991 for small quantity generators [more than 100 kilograms but less than 1,000 kilograms (2,200 pounds) per month]. Generators are advised that waste that did not exhibit the EP toxicity characteristics may be categorized as hazardous under TCLP.

The latest version of the TCLP procedure can be found in the Federal Register, Vol. 55, pages 26986-2698, dated June 29, 1990.

**TCLP Constituents and Levels**

<u>Contaminant</u>	<u>Level (mg/l)</u>	<u>Contaminant</u>	<u>Level (mg/l)</u>
Arsenic (7440-38-2)	5.0	Hexachlorobenzene (118-74-1)	0.13
Barium (7440-39-3)	100.0	Hexachlorobutadiene (87-68-3)	0.5
Benzene (71-43-2)	0.5	Hexachloroethane (67-72-1)	3.0
Cadmium (7440-43-9)	1.0	Lead (7439-92-1)	5.0
Carbon tetrachloride (56-23-5)	0.5	Lindane (58-89-9)	0.4
Chlordane (57-74-9)	0.03	Mercury (7439-97-6)	0.2
Chlorobenzene (108-90-7)	100.0	Methoxychlor (72-43-5)	10.0
Chloroform (67-66-3)	6.0	Methyl ethyl ketone (78-93-3)	200.0
Chromium (7440-47-3)	5.0	Nitrobenzene (98-95-3)	2.0
o-Cresol (95-48-7)	200.0	Pentachlorophenol (87-86-5)	100.0
m-Cresol (108-39-4)	200.0	Pyridine (110-86-1)	5.0
p-Cresol (106-44-5)	200.0	Selenium (7782-49-2)	1.0
Cresol (1319-77-3)	200.0	Silver (7440-22-4)	5.0
2,4-D (94-75-7)	10.0	Tetrachloroethylene (127-18-4)	0.7
1,4-Dichlorobenzene (106-46-7)	7.5	Toxaphene (8001-35-2)	0.5
1,2-Dichloroethane (107-06-2)	0.5	Trichloroethylene (79-01-6)	0.5
1,1-Dichloroethylene (75-35-4)	0.7	2,4,5-Trichlorophenol (95-95-4)	400.0
2,4-Dinitrotoluene (121-14-2)	0.13	2,4,6-Trichlorophenol (88-06-2)	2.0
Endrin (72-20-8)	0.02	2,4,5-TP (Silvex) (32534-95-5)	1.0
Heptachlor (76-44-8)	0.008	Vinyl chloride (75-01-4)	0.2

### 3. Hazardous Waste Generator Rules

If you generate more than 100 kilograms (about 25 gallons or 220 pounds) in a month of hazardous wastes, you are required by law to comply with certain activities. These include:

- Identify and determine the volume of all hazardous waste that your facility generates.
- Determine if you generate more than 100 kilograms (220 pounds) of hazardous waste (total per any calendar month).
- Obtain a U.S. Environmental Protection Agency Identification Number (see the next section for how to apply, etc.).
- Store hazardous wastes in approved, safe, sealed storage containers, usually 55-gallon drums. Contact your Field Area Office for more information.
- Each container must be properly labeled and closed. Contact your Field Area Office for more information.
- All hazardous waste containers must be stored in a secure location, and you must conduct visual periodic inspections for leaks, usually weekly.
- All employees must be familiar with handling and emergency procedures.
- You can only store hazardous waste for a specified time before you must have it removed for treatment or disposal.
- You are responsible for all hazardous waste from the time it is generated until it is disposed of (cradle-to-grave), even though you may turn it over to a transporter and/or disposal facility.
- EPA requires that all hazardous waste transporters and disposal facilities have an EPA Identification Number. Be sure to check for this before you turn your waste over to your service provider. Keep a copy in your files.
- Because of the complexities of hazardous waste treatment, you may not treat, transport, or dispose of your own hazardous wastes without a corresponding U.S. Environmental Protection Agency permit.
- Prepare and submit all required U.S. Environmental Protection Agency and state hazardous waste management agency reports in a timely fashion.

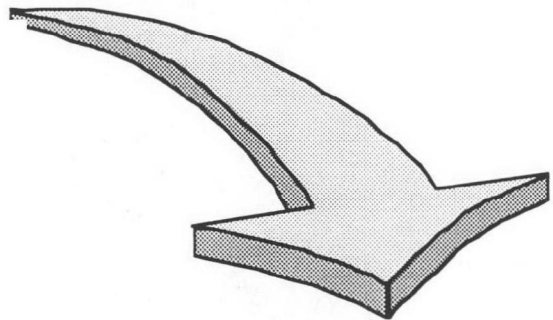
## 4. Obtaining a U.S. Environmental Protection Agency Identification Number

If you generate more than 100 kilograms (220 pounds) of hazardous waste in any one calendar month, you are either a Small Quantity Generator (SQG) or a Large Quantity Generator (LQG), and must obtain a U.S. EPA Identification Number for each site or location where hazardous wastes are generated. Transporters and facilities that store, treat, or dispose of regulated quantities of hazardous waste must also have a U.S. EPA Identification Number. A U.S. EPA Identification Number is a twelve-character number that uniquely identifies your facility and will be used as part of a national database on hazardous waste activities.

To obtain a U.S. EPA Identification Number, you can:

- Call or write to your state hazardous waste management agency or regional EPA office and ask for a copy of EPA Form 8700-12, "Notification of Hazardous Waste Activity." You will be sent the form and a booklet with instructions for filling it out.
- Complete the form, keep copies for your environmental records, and submit the completed form to the designated regulatory office.

(See graphic on next page)



United States  
Environmental Protection  
Agency  
Washington, DC 20460  
November 1993

**EPA** Notification of Regulated Waste Activity

EPA Form 8700-12 (Rev. 11/93) Previous editions are obsolete.

This document explains everything you need to know about getting an EPA Identification Number

**EPA Form 8700-12**

Call your regional EPA office, state hazardous waste office, or

RCRA/Superfund  
Industry Assistance  
Hotline  
1-800-424-9346

Original form of EPA Form 8700-12 (Rev. 11/93) is the official form for use by all states and EPA offices.

Please refer to the instructions for filling out this form before completing this form. The information requested here is required by law (Section 3005 of the Resource Conservation and Recovery Act).

**EPA** Notification of Regulated Waste Activity  
United States Environmental Protection Agency

Date Received (For Official Use Only)

I. Installation's EPA ID Number (Mark X in the appropriate box)

A. First Notification	B. Subsequent Notification (Complete item C)	C. Installation's EPA ID Number
-----------------------	----------------------------------------------	---------------------------------

II. Name of Installation (Include company and specific site name)

III. Location of Installation (Physical address not P.O. Box or Route Number)

Street

Street (Continued)

City or Town

State

Zip Code

County Code

County Name

IV. Installation Mailing Address (See instructions)

Street or P.O. Box

City or Town

State

Zip Code

V. Installation Contact (Person to be contacted regarding waste activities at site)

Name (Last)

First

Job Title

Phone Number (Area Code and Number)

VI. Installation Contact Address (See instructions)

A. Contact Address (Include company and specific site name)

B. Street or P.O. Box

City or Town

State

Zip Code

VII. Ownership (See instructions)

A. Name of Installation's Legal Owner

Street, P.O. Box, or Route Number

City or Town

State

Zip Code

Phone Number (Area Code and Number)

B. Land Type	C. Owner Type	D. Change of Owner Indicator	E. Date Changed
		Yes No	Month Day Year

EPA Form 8700-12 (Rev. 11/93) Previous editions are obsolete. Continued on Reverse



Use this form to report waste management activities at your facility. This form is to be used in conjunction with EPA Form 8700-12, Rev. 11-30-93.

**ID - For Official Use Only**

**VIII. Type of Regulated Waste Activity (Mark "X" in the appropriate boxes. Refer to instructions.)**

A. Hazardous Waste Activity		B. Used Oil Recycling Activities	
1. Generator (See instructions)	3. Treater, Storer, Disposer (at installation) Note: A permit is required for this activity; see instructions.	1. Used Oil Fuel Marker	
a. Greater than 1000 kgmo (2,200 lbs.)		a. Marker Directs Shipment of Used Oil to Off-Specification Burner	
b. 100 to 1000 kgmo (200-2,200 lbs.)		b. Marker Who First Claims the Used Oil Meets the Specifications	
c. Less than 100 kgmo (220 lbs.)		2. Used Oil Burner - Indicate Type(s) of Combustion Device(s)	
2. Transporter (Indicate Mode in boxes 1-5 below)	4. Hazardous Waste Fuel	a. Utility Boiler	
a. For own waste only	a. Generator/Marking to Burner	b. Industrial Boiler	
b. For commercial purposes	b. Other Markers	c. Industrial Furnace	
Mode of Transportation	c. Boiler and/or Industrial Furnace	3. Used Oil Transporter - Indicate Type(s) of Activity(ies)	
1. Air	1. Smelter/Refinery	a. Transporter	
2. Rail	2. Small Quantity Exemption	b. Transfer Facility	
3. Highway	Indicate Type of Combustion Device(s)	4. Used Oil Processor/Re-refiner - Indicate Type(s) of Activity(ies)	
4. Water	1. Utility Boiler	a. Process	
5. Other - specify	2. Industrial Boiler	b. Re-refine	
	3. Industrial Furnace		
	5. Underground Injection Control		

**IX. Description of Hazardous Wastes (Use additional sheets if necessary.)**

A. Characteristics of Nonlisted Hazardous Wastes (Mark "X" in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. See 40 CFR Parts 261.20 - 261.24)

1. Ignitable (D001)	2. Corrosive (D002)	3. Reactive (D003)	4. Toxicity Characteristic (List specific EPA hazardous waste numbers for the Toxicity characteristic contaminant(s))

B. Listed Hazardous Wastes (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

1	2	3	4	5	6
7	8	9	10	11	12

C. Other Wastes (State all other wastes requiring a manifest to have an ID number. See instructions.)

1	2	3	4	5	6

**X. Certification**

I, \_\_\_\_\_, of \_\_\_\_\_, certify that the information provided on this form is true and correct, and that the waste management activities described herein are in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and that the waste management activities described herein are in accordance with the applicable state and federal laws, regulations, and orders. I understand that there are significant penalties for submitting false information, including the possibility of imprisonment and/or fines.

Signature	Name and Official Title (Type or print)	Date Signed

**XI. Comments**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Note: Must be completed form to the appropriate EPA Regional or State Office. (See Section III of the Manual for addresses.)

EPA Form 8700-12 (Rev. 11-30-93) Previous edition is obsolete.

Contact your regional EPA office or the designated state office for additional information on obtaining the Environmental Protection Agency Identification Number

(see contact section of this resource manual)

# Notification of Regulated Waste Activity

EPA Form 8700-12

Use this form to report waste management activities at your facility. This form is to be used in conjunction with EPA Form 8700-12, Rev. 11-30-93.

**ID - For Official Use Only**

**IX. Description of Regulated Wastes (Additional Sheet)**

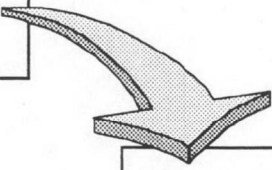
B. Listed Hazardous Wastes (See 40 CFR 261.31 - 33. Use this page only if you need to list more than 12 waste codes.)

13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102
103	104	105	106	107	108
109	110	111	112	113	114
115	116	117	118	119	120

EPA Form 8700-12 (Rev. 11-30-93) Previous edition is obsolete.



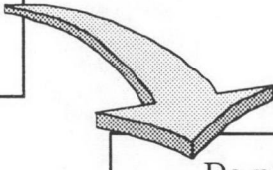
CESQG?



Do not accumulate more than  
1,000 kilograms (2,200 pounds)

or you must be reclassified as a SQG!

SQG?



Do not accumulate more than  
6,000 kilograms (13,200 pounds)

in any 180 day period

or

270 days if your waste must be trans-  
ported over 200 miles for disposal,

or you must obtain a special permit!

LQG?



## 5. Hazardous Waste Accumulation and Storage Limits

There are storage limits for hazardous wastes for Conditionally Exempt Small Quantity Generators (CESQG), Small Quantity Generators (SQG), and Large Quantity Generators (LQG). If you decide to accumulate hazardous waste until you have collected enough to make transport to a licensed hazardous waste management facility more economical, make sure that:

- If you are a CESQG, you cannot accumulate more than 1,000 kilograms (2,200 pounds) of hazardous waste at any time or you will be subject to the same requirements as a SQG.
- If you are a SQG or LQG, you can accumulate no more than 6,000 kilograms (13,200 pounds) of hazardous waste in any 180 day period (or 270 days if your waste must be transported over 200 miles to a licensed hazardous waste facility). Otherwise, you will need a special storage permit from EPA.

You can store hazardous waste in 55-gallon drums, tanks, or other containers suitable for the type of waste generated if you follow certain common sense rules that are meant to protect human health and the environment, and reduce the likelihood of damages or injuries caused by leaks or spills of hazardous wastes. If you store your hazardous waste in containers, you must:

- Clearly mark each container with the words "HAZARDOUS WASTE," and the date you began to collect waste in that container.
- Keep all containers in good condition, handle them carefully, and replace any leaking ones. Be sure to store all containers indoors and not exposed to the elements.
- Do not store hazardous waste in a container that may rupture, leak, corrode, or otherwise fail.
- Keep all containers closed except when filling them.
- Inspect all containers with hazardous waste for leaks or corrosion every week.
- For safety reasons, make sure that if you are storing ignitable or reactive wastes, the containers are placed as far as possible from your facility property line to create a buffer zone.
- Never store wastes in the same container that could react together to cause fires, leaks, or other releases.

- As a general safety rule, do not stack drums.
- Make sure that the stored waste is taken off-site or treated on-site within 180 (or 270) days.
- Do not mix nonhazardous wastes with hazardous wastes. For example, do not put nonhazardous cleaning agents or rags in the same container as a hazardous solvent or the entire contents becomes subject to the hazardous regulations.
- Avoid mixing several different hazardous wastes. Doing so may make recycling very difficult, if not impossible, or make disposal more expensive.
- Make sure the original containers of hazardous products are completely empty before you throw them away. Use all the product.
- Avoid using more of a hazardous product than you need. For example, use no more degreasing solvent or pesticide than you need to do the job, and certainly consider nonhazardous alternatives before you buy hazardous materials. Also, do not throw away a container with unused solvent or pesticide in it.
- Consider secondary containment systems as a precaution against an accidental leak or spill. If leakages or spills do occur, immediately clean them up in accordance with your park plan.

If you store your hazardous wastes in tanks, you must follow similar common sense rules:

- Do not store hazardous waste in a tank if it may cause rupture, leaks, corrosion, or otherwise cause the tank to fail.
- Keep a tank covered or provide at least two feet of freeboard (space at the top of the tank) in uncovered tanks.
- If your tanks have equipment that allow the waste to flow into them continuously, provide waste feed cutoff or bypass systems to stop the flow in case of problems.
- Inspect any monitoring or gauging systems on each operating day and inspect the tanks themselves for leaks or corrosion every week.
- Use the National Fire Protection Association's (NFPA) buffer zone requirements for tanks containing ignitable or reactive wastes. These requirements specify distances considered as safe buffer zones for various liquids based on the characteristics of all combustible and flammable liquids.

The storage requirements and container specifications for hazardous wastes under the Resource Conservation and Recovery Act are very similar to the requirements outlined by the Occupational Safety and Health Administration. Complying with one will usually ensure compliance with the other. However, if you have any questions, please contact your state hazardous waste regulatory office, your EPA regional office, or your NPS Area Office Environmental Coordinator.

## 6. Shipping Hazardous Waste Off-Site

Carefully choosing a hauler and designating a waste management facility is vitally important. The hauler will be handling your wastes beyond your control while you are still responsible for their proper management. Similarly, the waste management facility will be the final destination of your hazardous waste for treatment, storage, or disposal. Before choosing a hauler or designating a disposal facility, check with the following sources:

- Your professional colleagues and other parks who may have used a specific hazardous waste hauler or designated facility in the past.
- Your Better Business Bureau or Chamber of Commerce to find out if any complaints have been registered against a hauler or facility.
- Your state hazardous waste management agency or your regional U.S. Environmental Protection Agency (EPA) office, which will be able to tell you whether or not a company has a U.S. Environmental Protection Agency Identification Number, and may know whether or not the company has had any problems. Also contact your Field Area Office for more assistance.

After checking these sources, contact the hauler and designated hazardous waste management facility directly to verify that they have U.S. Environmental Protection Agency Identification Numbers, and that they can and will handle your waste. Also make sure that they have the necessary permits and insurance, and that the hauler's vehicles are in good condition. Checking sources and choosing a hauler and designated facility may take some time – try to begin checking well ahead of the time you will need to ship your waste. Careful selection is very important. Remember, you are responsible for your hazardous wastes from “cradle-to-grave,” even after you turn it over to the hauler, and even after it has been disposed.

### **Preparing Your Wastes for Shipment**

When you prepare hazardous wastes for shipment, you must put the wastes in containers that are acceptable for transportation and make sure the containers are properly labeled. Reusing product containers may be possible if they meet the DOT requirements; contact your Field Area Office if you have any questions. Your hauler should be able to assist you as you might need. If you need additional information, you may wish to consult the requirements for packaging and labeling hazardous wastes found in the Department of Transportation (DOT) regulations (49 CFR 172). To find out what these requirements are for your wastes, you should contact your state hazardous waste management agency for the name and telephone number of your state transportation agency. Your state transportation agency, your hauler, or your designated facility can help you understand the DOT requirements.

### **The Uniform Hazardous Waste Manifest**

A hazardous waste manifest is a multicopy shipping document that you must fill out and use to accompany your hazardous waste shipments. The manifest form is designed so that shipments of hazardous waste can be tracked from their point of generation to their final destination – the so-called “cradle-to-grave” system. The hazardous waste generator, the hauler, and the designated facility must each sign this document and keep a copy. The designated facility operator also must send a copy back to you, so that you can be sure that your shipment arrived. You must keep this copy, which will be signed by the hauler and designated facility, on file for three years.

If you do not receive a signed copy from the designated hazardous waste management facility within 30 days, it is a good idea for you to find out why, and if necessary, let the state or EPA know. Remember: Just because you have shipped the hazardous waste off your site and it is no longer in your possession, your liability has not ended. You are potentially liable under Superfund for any mismanagement of your hazardous waste. The manifest will help you track your waste during shipment and make sure it arrives at the proper destination.

You can obtain blank copies of the manifest from several sources such as the following:

- If the state to which you are shipping your waste has its own manifest, use that manifest form. Contact the hazardous waste management agency of that state, your hauler, or the designated facility you intend to use for manifest forms.
- If the state to which you are shipping your waste does not have its own manifest, use the manifest of the state in which your waste was generated. Contact your hauler or your state hazardous waste agency for blank forms.
- If neither state requires a state-specific manifest, you may use the general “Uniform Hazardous Waste Manifest” – EPA Form 8700-22. Copies are available from some haulers and designated hazardous waste management facilities, or may be purchased from some commercial printers.

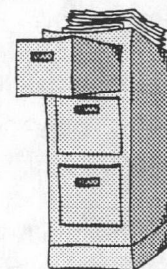
States, haulers, recyclers, and designated facilities may require additional information; check with them before you prepare a hazardous waste shipment. Your hazardous waste hauler often will be the best source for packaging and shipping information and will help in completing the manifest. EPA has also prepared some industry-specific information to help you in completing the manifest which is available through your regional EPA office.

**You** are responsible for determining if your waste is hazardous!

**You** must use a Waste Manifest form for shipment of all hazardous wastes from your site!

**You** are responsible for your hazardous waste for 30 years after you have generated it!

A Waste Manifest is usually a 6-part form.



One copy for your recordkeeping files

## Waste Manifest

EPA Form 8700-22

### Important to Note

**GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and applicable state regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method available to me that I can afford.

MISSOURI DEPARTMENT OF NATURAL RESOURCES  
Division of Environmental Quality  
Hazardous Waste Program  
P.O. Box 178 Jefferson City, Missouri 65102  
314-751-3178

**HAZARDOUS WASTE MANIFEST**

INSTRUCTIONS FOR THE COMPLETION OF THIS FORM ARE ON A SEPARATE SHEET.  
THIS DOCUMENT MUST BE KEPT FOR ALL MISSOURI-DESTINED SHIPMENTS.

1. Generator's Name and Mailing Address  
2. Generator's Phone  
3. Transporter's Company Name  
4. Transporter's Phone  
5. Shipper's Name and Address  
6. Shipper's Phone  
7. EPA ID Number  
8. EPA ID Number  
9. EPA ID Number  
10. EPA ID Number  
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96. EPA ID Number  
97. EPA ID Number  
98. EPA ID Number  
99. EPA ID Number  
100. EPA ID Number

MISSOURI DNR FINAL COPY - PART 1

MUST BE SENT BACK TO THE GENERATOR BY THE DESIGNATED DATE TRANSMITTED TO THE DEPARTMENT BY THE GENERATOR



**HERITAGE ENVIRONMENTAL SERVICES, INC.**  
Land Disposal Restrictions Notification Form for Supplemental Fuel

Complete both front and back. Retain one copy for 5 years along with the generator copy of the manifest. Attach the original to the manifest for shipment to Heritage.

Generator/Customer Name \_\_\_\_\_  
Address \_\_\_\_\_  
EPA I.D. \_\_\_\_\_ EPA Hazardous Waste No. \_\_\_\_\_  
Hazardous Waste Manifest No. \_\_\_\_\_ Heritage WasteStream No. \_\_\_\_\_

In accordance with the Hazardous and Solid Waste Amendments of 1984 (HSWA) of the Resource Conservation and Recovery Act which restricts the land disposal of hazardous wastes, we are notifying by marking the appropriate box(es) that indicate the method and level our waste(s) must be treated to comply with the Land Disposal Restrictions contained at 40 CFR Part 268. This material is intended to be used as a supplemental fuel for energy recovery.

Hazardous Waste Description	Constituents of Concern	<input type="checkbox"/> Non-Wastewater Total Composition, mg/kg	<input type="checkbox"/> Wastewater Total Composition, mg/L
<input type="checkbox"/> P001 - Spent halogenated solvents used in degreasing	Carbon tetrachloride Methylene chloride Tetrachloroethylene 1,1,1-Trichloroethane Trichloroethylene 1,1,2-Trichloro-1,2,2,2-tetrafluoroethane Tetrachloroethane	5.6 33 5.6 5.6 5.6 26 33	0.057 0.088 0.088 0.088 0.088 0.088 0.088
<input type="checkbox"/> P002 - Spent halogenated solvents	Chlorobenzene 1,2-Dichlorobenzene Methylene chloride Methylene chloride (from the pharmaceutical industry) Tetrachloroethylene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethylene 1,1,2-Trichloro-1,2,2,2-tetrafluoroethane Tetrachloroethane	5.7 5.2 33 33 5.6 5.6 7.8 5.6 26 33	0.057 0.088 0.088 0.14 0.088 0.088 0.088 0.088 0.088 0.088
<input type="checkbox"/> P003 - Spent non-halogenated solvents	Acetone n-Butyl alcohol Cyclohexanone Ethyl acetate Ethyl benzene Ethyl ether Hexanol Methyl isobutyl ketone Xylene (total)	180 5.8 0.75 33 6.0 180 0.75 33 26	0.28 5.8 0.34 0.088 0.088 0.12 5.8 0.14 0.32
<input type="checkbox"/> P004 - Spent non-halogenated solvents	Cresol (m and p isomers) o-Cresol Nitrobenzene	5.2 5.8 14	0.71 0.11 0.088
<input type="checkbox"/> P005 - Spent non-halogenated solvents	Benzene Carbon disulfide 2-Ethoxyethanol Isobutanol Methyl ethyl ketone 2-Nitropropane  Pyridine Toluene	5.7 4.8 NCH 170 36 NCH  18 18	0.075 0.014 BOD <sub>5</sub> or NCH 5.8 0.28 NCH NCH 0.14 0.14 0.08

Standard is TCLP (mg/L) rather than total

HCW118L/18  
11/82/88

You typically must send a completed Waste Manifest copy (returned from the disposal facility) to your state hazardous materials agency after it has been disposed.

If you do not receive a copy from the disposal facility within 35 days, notify your state.

## Land Disposal Restrictions Notification Form

A completed Land Disposal Restrictions Notification is usually required with your shipment of hazardous waste.

Everyone needs an EPA Identification Number!

Subcategory	Treatability Group	CFR Ref. Std.	Five Letter Code	
<input type="checkbox"/> K006	NA	WW/Non-WW	268.41, 268.43	NA - Conc. Based Std.
<input type="checkbox"/> D001	≥ 10% TOC	Non-WW	NA - Tech Based	FSUBS
<input type="checkbox"/> This shipment includes additional wastes identified below:				

Hazardous Waste No.	Subcategory	Treatability Group	CFR Reference Treatment Standards	Five Letter Treatment Code as Applicable

☐ I CERTIFY that this waste does not contain 2-ethoxyethanol or 2-nitropropane (check box if applicable).

☐ Analysis is attached (check box if applicable).

I CERTIFY that the information submitted herein and all accompanying information is true and accurate.

Authorized signature: \_\_\_\_\_

Print or Type Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Heritage is providing this sample Land Disposal Restrictions Notification form as a courtesy to our customers. Heritage does not warrant the acceptability of this form to EPA or for any specific purpose, waste or treatment method and does not warrant that its use will constitute compliance with applicable law. Heritage will not assume any responsibility or liability, and expressly disclaims responsibility or liability, for any penalties, damages or other costs which may arise out of or be related to use of this document. Each person who makes a Land Disposal Restrictions notification is responsible for ensuring that it complies with and meets applicable law. If you choose to use this sample form, please review it carefully to ensure it complies with the requirements for your specific waste(s).

HCW118L/18  
11/82/88



Federal regulations allow you to haul your hazardous waste to a designated facility yourself. You must, however, obtain an EPA transporter identification number and comply with applicable DOT requirements for packaging, labeling, marking, and placarding your shipment. There are also financial responsibility and liability requirements under the Federal Motor Carrier Act, but you may be exempt from these if you:

- Use a vehicle with a Gross Vehicle Weight Rating of less than 10,000 pounds (van or pickup).
- Transport your wastes for commerce within your state in non-bulk shipments (e.g., containers with capacities of less than 3,500 gallons).
- Transport hazardous wastes which meet the “limited quantity exclusion” requirements of §172.101 of the DOT regulations.

## 7. Container Labeling and Other Forms of Warning

**E**ach container of hazardous waste must be properly marked and labeled in accordance with Department of Transportation (DOT) regulations (49 CFR 172, Subpart D-E). These regulations require:

- Proper DOT shipping name on each waste drum.
- Proper DOT identification number on each waste drum.
- Proper U.S. Environmental Protection Agency waste number (code) on each waste drum. (See this section of the Resource Manual.)
- Generator's U.S. Environmental Protection Agency (EPA) Identification Number, name, and address on each drum. (See this section of the Resource Manual.)
- Properly labeled for ignitable, reactive, corrosive, or toxic waste.
- Each container must include the date when it becomes full.
- Each container must be labeled with the words "HAZARDOUS WASTE."
- Waste containers must show identification of their waste contents, not the original product if reusing containers.

## 8. EPA Hazardous Waste Numbers (Codes)

The Environmental Protection Agency has established a range of special codes that generally identify solid hazardous wastes. These codes are used in conjunction with EPA Form 8700-12 "Notification of Hazardous Waste Activity," and EPA Form 8700-22, "Uniform Hazardous Waste Manifest" (or equivalent). (See previous sections of this Resource Manual.)

### *Solvents*

Solvents, spent solvents, solvent mixtures, or solvent still bottoms are often hazardous. This includes solvents used in degreasing (identified as F001) and paint brush cleaning and distillation residues from reclamation. The following are some commonly used hazardous solvents (also see ignitability wastes for other hazardous solvents, and 40 CFR 561.31 for most listed hazardous waste solvents):

Benzene	F005
Carbon Disulfide	F005
Carbon Tetrachloride	F001
Chlorobenzene	F002
Cresols	F004
Cresylic Acid	F004
O-Dichlorobenzene	F002
Ethanol	D001
2-Ethoxyethanol	F005
Ethylene Dichloride	D001
Isobutanol	F005
Isopropanol	D001
Kerosene	D001
Methyl Ethyl Ketone	F005
Methylene Chloride	F001, F002
Naphtha	D001
Nitrobenzene	F004
2-Nitropropane	F005
Petroleum Solvents (Flashpoints <140°F)	D001
Pyridine	F005
1,1,1-Trichloroethane	F001, F002
1,1,2-Trichloroethane	F002
Tetrachloroethylene	F001, F002
Toluene	F005
Trichloroethylene	F001, F002
Trichlorofluoromethane	F002

Trichlorotrifluoroethane	F002
White Spirits	D001

#### **Acids and Bases**

Acids, bases, or mixtures having a pH less than or equal to 2, or greater than or equal to 12.5, are considered corrosive. All corrosive materials and solvents have the EPA Hazardous Waste Number D002. The following are some of the more commonly used corrosives:

Acetic Acid	Nitric Acid
Ammonium Hydroxide	Oleum
Chromic Acid	Perchloric Acid
Hydrobromic Acid	Phosphoric Acid
Hydrochloric Acid	Postassium Hydroxide
Hydrofluoric Acid	Sodium Hydroxide
Sulfuric Acid	

#### **Dry Cleaning Filtration Residues**

Cooked powdered residue (perchloroethylene plants only), still residues, and spent cartridge filters containing perchloroethylene or valclene are hazardous and have the EPA Hazardous Waste Number F002.

Still residues containing petroleum solvents with a flash point less than 140°F are considered hazardous and have the EPA Hazardous Waste Number D001.

#### **Heavy Metals and Inorganics**

Heavy metals and other inorganic waste materials exhibit the characteristic of Toxicity and are considered hazardous if the extract from a representative sample of the waste has any of the specific constituent concentrations as shown in 40 CFR 261.24, Table 1. This may include dusts, solutions, wastewater treatment sludges, paint wastes, waste inks, and other such materials which contain heavy metals/inorganics (note that wastewater treatment sludges from electroplating operations are identified as F006). The following are evaluated in all TCLP tests:

Arsenic	D004
Barium	D005
Cadmium	D006
Chromium	D007
Lead	D008
Mercury	D009
Selenium	D010
Silver	D011

### ***Ignitable Wastes***

Ignitable wastes include any liquids that have a flashpoint less than 140°F, any non-liquids that are capable of causing a fire through friction, absorption of moisture, or spontaneous chemical change, or any ignitable compressed gas as described in 49 CFR 173.300 (for a complete description of ignitable wastes, see 40 CFR 264.21, Characteristic of ignitability). Examples are spent solvents (see also solvents), solvent still bottoms, ignitable paint wastes (paint removers, brush cleaners and stripping agents), epoxy resins and adhesives (epoxies, rubber cements and marine glues), and waste inks containing flammable solvents. Unless otherwise specified, all ignitable wastes have the EPA Hazardous Waste Number of D001.

Some commonly used ignitable compounds are:

Acetone	F003
Benzene	F005
n-Butyl Alcohol	F003
Chlorobenzene	F002
Cyclohexanone	F003
Ethyl Acetate	F003
Ethylbenzene	F003
Ethyl Ether	F003
Ethylene Dichloride	D001
Methanol	F003
Methyl Isobutyl Ketone	F003
Petroleum Distillates	D001
Xylene	F003

### ***Ink Sludges Containing Chromium and Lead***

This includes solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead. All ink sludges have the EPA Hazardous Waste Number K086.

### ***Lead-Acid Batteries***

Used lead-acid batteries should be reported on the notification form only if they are not recycled. Used lead-acid batteries that are recycled do not need to be counted in determining the quantity of waste that you generate per month, nor do they require a hazardous waste manifest when shipped off your premises. Be sure you check your MSDS on used batteries to determine proper classification. Note: Special requirements do apply if you recycle your batteries on your own premises – see 40 CFR 266).

Lead Dross	D008
Spent Acids	D002
Lead-Acid Batteries	D008

Most other batteries (e.g., mercury, Ni-Cd) are to be recycled and not disposed of.

### ***Pesticides***

The pesticides listed below are hazardous. Wastes marked with an asterisk (\*) have been designated acutely hazardous. (See section in this Resource Manual for more information.) For a more complete listing, see 40 CFR 261.32 and §261.33 for specific listed pesticides, and other wastes, wastewaters, sludges, and by-products from pesticide formulators. (Note that while many of these pesticides are no longer in common use, they are included here for those cases where they may be found in storage).

*Aldicarb	P070
*Aldrin	P004
Amitrole	U011
*Arsenic Pentoxide	P011
*Arsenic Trioxide	P012
Cacodylic Acid	U136
Carbamic Acid, Methylnitroso-Ethyl Ester	U178
Chlordane	U036
*Copper Cyanides	P029
1,2-Dibromo-3-chloropropane	U066
1,2-Dichloropropane	U083
1,3-Dichloropropene	U084
2,4-Dichlorophenoxy Acetic Acid	U240
DDT	U061
*Dieldrin	P037
Dimethylcarbamoyl Chloride	U037
*Dinitrocresol	P047
*Dinoseb	P020
Disodium Monomethanearsenate	D004
*Disulfoton	P039
*Endosulfan	P050
*Endrin	P051
Ethylmercuric Chloride	D009
*Famphur	P097
*Heptachlor	P059
Hexachlorobenzene	U127
Kepone	U142
Lindane	U129
2-Methoxy Mercuric Chloride	D009
Methoxychlor	D014

*Methyl Parathion	P071
Monosodium Methanearsenate	D004
*Nicotine	P075
*Parathion	P089
Pentachloronitrobenzene	U185
Pentachlorophenol	U242
Phenylmercuric Acetate	D009
*Phorate	P094
*Strychnine	P108
2,4,5-Trichlorophenoxy Acetic Acid	U232
2-2,4,5-Trichlorophenoxy- Propionic Acid	U233
*Thallium Sulfate	P115
Thiram	U244
*Toxaphene	P123
Warfarin	U248

### ***Reactives***

Reactive wastes include reactive materials or mixtures which are unstable, react violently with or form explosive mixtures with water, generate toxic gases, or vapors when mixed with water (or when exposed to pH conditions between 2 and 12.5 in the case of cyanide or sulfide bearing wastes), or are capable of detonation or explosive reaction when heated or subjected to shock (for a complete description of reactive wastes, see 40 CFR 261.23, Characteristic of reactivity). Unless otherwise specified, all reactive wastes have the EPA Hazardous Waste Number D003. The following materials are commonly considered to be reactive:

Acetyl Chloride	Organic Peroxides
Chromic Acid	Perchlorates
Cyanides	Permanganates
Hypochlorites	Sulfides

### ***Spent Plating and Cyanide Wastes***

Spent plating wastes contain cleaning solutions and plating solutions with caustics, solvents, heavy metals, and cyanides. Cyanide wastes may also be generated from heat treatment operations, pigment production, and manufacturing of anticaking agents. Plating wastes are generally Hazardous Waste Numbers F006 - F009, with F007 - F009 containing cyanide. Cyanide heat treating wastes are generally Hazardous Waste Numbers F010 - F012. See 40 CFR 261.32 for a more complete description of plating wastes.

### **Wood Preserving Agents**

The wastewater treatment sludges from many wastewater treatment operations (from wood preserving operations) are considered hazardous (EPA Hazardous Waste Number K001 – bottom sediment sludges from the treatment of wastewater processes that use creosote and pentachlorophenol). In addition, unless otherwise indicated, specific wood preserving compounds are:

Chromated Copper Arsenate	D004
Creosote	U051
Pentachlorophenol	F027



## 9. Polychlorinated Biphenyls (PCBs)

There was a time when many high-voltage power transformers were constructed using polychlorinated biphenyls (PCBs) as an insulation agent. Since that time, Congress has determined that PCBs pose a hazard to the life and health of humans and animals and our environment. As a result, the U.S. Environmental Protection Agency (EPA) was assigned overall responsibility for the development, dissemination, inspection, and enforcement of regulations to fulfill the laws passed by Congress. New regulations are now out and the original regulations are published in 40 CFR 761. Although the National Park Service is fully responsible for compliance with the applicable regulations, the following are a few overall guidelines regarding PCB transformers, or transformers that have been contaminated with PCBs by having used PCB oils.

**Action Item:** If you have power transformers in your park, determine which units contain PCBs. When in doubt, contact the manufacturer or distributor, or your EPA regional office (phone numbers listed in the front of this book) for a determination.

### *Storage for Reuse*

Transformers containing PCBs at any concentration may be stored for reuse. While there are no time limitations on this storage, transformers with concentrations of 50 parts per million (ppm) or greater (known or assumed) which are stored for reuse should be in a condition suitable for reuse. Equipment that is not suitable for reuse (e.g., out of date, no longer meets usage need, damaged, does not meet performance specifications) will be considered improperly disposed of. Units that are in storage for reuse are considered by EPA to be “in service” for purposes of this regulation. Also, as of October 1, 1985, the storage for reuse of PCB transformers (500 ppm or greater) that pose an exposure risk to food or feed, is prohibited [§761.30(a)(1)(i)].

EPA does not require nonfunctional transformers (regardless of PCB concentrations) to be placed into “storage for disposal” if you intend to repair and reuse the item. However, EPA may have grounds to enforce against lengthy “storage for reuse” of equipment which is not reasonably expected to be placed back into service. The owner should be able to demonstrate good faith compliance with the intent of the storage for disposal requirements and complete any required servicing or repairs within a reasonable amount of time. Any item that is damaged and cannot be repaired for regulatory or technical reasons must be disposed of or placed into storage for disposal.

### *Storage for Disposal*

All PCB and PCB-contaminated transformers must be dated when placed into storage for disposal [§761.65(c)(8)] and must be removed from storage and disposed of within one year [§761.65(a)].

The facility used to store PCB and PCB-contaminated transformers must comply with the “storage for disposal” requirements [§761.65(b)(1)].

Non-leaking PCB and PCB-contaminated transformers may be stored temporarily by the generator in an area that does not comply with the requirements for a PCB storage facility for up to 30 days from the date of their removal from service for disposal, provided that a notation is attached to each transformer indicating the date the item was removed from service [§761.65(c)(1)(i)], and placed into storage for disposal [§761.65(c)(8)].

Leaking PCB and PCB-contaminated transformers which are placed in PCB containers that comply with U.S. Department of Transportation (DOT) specifications [§761.65(c)(6)] with sufficient sorbent materials to absorb any liquid PCBs, may also be temporarily stored by the generator for up to 30 days provided that a notation is attached to the container indicating the dates the transformers were removed from service [§761.65(c)(1)(ii)], and placed into storage for disposal [§761.65(c)(8)]. Each container or drum used to store leaking PCB items must be marked in accordance with EPA marking and labeling requirements [§761.40(a)(1)].

Nonleaking and structurally undamaged PCB-contaminated transformers, that have not been drained of free-flowing dielectric fluid, may also be stored on pallets next to a PCB storage facility which meets the requirements for storage for disposal. This type of storage is permitted only when the storage facility has immediately available unfilled storage space equal to ten percent (10%) of the volume of the equipment stored outside the facility. The equipment stored outside the facility must be inspected for leaks weekly [§761.65(c)(2)], and a notation must be attached to each unit indicating the date the equipment was removed from service [§761.65(c)(1)] and placed into storage for disposal [§761.65(c)(8)].

Commercial storers now must seek approval to operate and demonstrate financial responsibility for closure of the facility under the new provisions of the Notification and Manifesting Rule which was published in the *Federal Register* on December 21, 1989.

### ***Disposal***

PCB transformers (500 ppm or greater) must be disposed of as follows:

- In an incinerator that complies with 40 CFR 761.70.
- In a chemical waste landfill which complies with 40 CFR 761.75 provided that: the transformer is first drained of all free-flowing liquid, filled with solvent, allowed to stand for at least 18 hours and then drained thoroughly. PCB liquids that are removed shall be disposed of by incineration under 40 CFR 761.60(a). Solvents may include kerosene, xylene, toluene, and other solvents in which PCBs are readily soluble. Precautionary measures should be taken, however, that the solvent flushing procedure is conducted in accordance with applicable safety and health standards as required by Federal or State regulations [§761.60(b)(1)(i)(B)].

- The PCB liquids that are removed, including the flushing solvent, must be disposed of in an incinerator that complies with 40 CFR 761.70, or by an alternative EPA-approved and permitted disposal method in accordance with 40 CFR 761.60(e).

PCB-contaminated transformers (from 50 to 499 ppm concentrations of PCBs) shall be disposed of as follows:

- By draining all free-flowing liquid from the transformer and disposing of the liquid in an incinerator that complies with 40 CFR 761.70; or, in a chemical waste landfill that complies with 40 CFR 761.75, if information is provided to the owner or operator of the chemical waste landfill that shows that the waste does not exceed 500 ppm PCBs and is not an ignitable waste as described in 40 CFR 761.75(b)(8)(iii); or, in an approved high efficiency boiler that complies with 40 CFR 761.65(a)(2)(iii); or by an alternative EPA approved and permitted disposal method that complies with 40 CFR 761.60(e) [§761.60(b)(4)].

The disposal of the drained contaminated equipment carcass is not regulated [§761.60(b)(5)(ii)]; however, drained PCB-contaminated transformer carcasses cannot be sold (distributed in commerce) for use as parts and components in repair or rebuilding activities.

There are no PCB disposal requirements for non-PCB transformers (less than 50 ppm PCBs). However, certain reuse restrictions apply to the less than 500 ppm PCB fluid. Waste oil with any detectable concentration of PCBs cannot be used as a sealant, coating, or dust control agent [§761.20(d)]; and also, can only be burned for energy recovery in specific combustion facilities described in 40 CFR 761.20(e)(1).

## 10. Potential Problem Products

The following automotive products are known to typically contain chlorinated solvents that can cause the spent products to be considered hazardous waste or can cause major cross contamination problems in your facility for used oil or for parts cleaning solutions.

For self-protection, examine the Material Safety Data Sheet (MSDS) for all such products in your facility. Also examine MSDSs for all proposed product purchases before allowing them on-site. If a product contains any one of these problem chemicals as a main ingredient or in concentrations greater than 10%, it would be advantageous to find alternatives to its use.

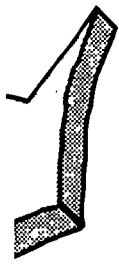
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|------------------------------------|-----------------------------------------------------------------------------------------------|
| • Brake Cleaner                    | 1,1,1-Trichloroethane (TCA, Trich)<br>and Perchloroethylene (PERC)                            |
| • Parts Washing Solvent            | Stoddard solvent and Mineral Spirits<br>Toluene<br>Xylene<br>Benzene<br>1,1,1-Trichloroethane |
| • Gasket Remover                   | Methylene Chloride                                                                            |
| • Paint Stripper                   | Methylene Chloride                                                                            |
| • Carburetor Cleaner               | Methyl Ethyl Ketone (MEK)<br>Toluene<br>Xylene                                                |
| • Oil Additives and Treatments     | Chlorinated Paraffins                                                                         |
| • Carburetor Cleaner and Cold Tank | Methylene Chloride<br>Cresylic Acid<br>Dichloro Benzene                                       |
| • Moisture Displacer               | 1,1,1-Trichloroethane                                                                         |
| • Aerosol Grease                   | 1,1,1-Trichloroethane<br>Methylene Chloride                                                   |
| • Moisture Sealants                | 1,1,1-Trichloroethane                                                                         |
| • Dry Lubricants                   | 1,1,1-Trichloroethane<br>Methylene Chloride                                                   |
| • Contact Point Cleaner            | 1,1,1-Trichloroethane                                                                         |

Material Safety Data Sheets are  
a Critical part of product control to avoid  
contamination and hazardous waste.

[illegible]

Remember, you can use the "CAS" system  
to identify unknown chemicals. **BE INFORMED**  
and **BE IN CONTROL!**

## 11. Material Safety Data Sheets



Chemical manufacturers and importers must develop a MSDS for each hazardous chemical they produce or import, and must provide the MSDS automatically at the time of the initial shipment of a hazardous chemical to distributors or users. Distributors must also ensure that employers are similarly provided a MSDS.

Each MSDS must be in English and include information regarding the specific chemical identity of the hazardous chemical(s) involved and the common names. In addition, information must be provided on the physical and chemical characteristics of the hazardous chemical; exposure limits; whether the chemical is considered to be a carcinogen; precautionary measures; emergency and first aid procedures; the identification of the organization responsible for preparing the sheet; and known acute and chronic health effects and related health information.

If you did not receive an MSDS with a product, you can obtain one by calling or writing to that product's manufacturer or distributor. They are required by law to prepare an MSDS and make it available to everyone that may use their product. The information contained in your MSDSs are key to your pollution prevention program and overall environmental management activities. Your overall objective is to reduce or eliminate the use of materials that have regulated chemicals. Review the MSDS for each new product to be sure that it does not contain substances that could make it subject to environmental regulations.

### Identity

Be sure to verify that the MSDS was prepared for the product you are considering or have received. Do this by comparing the product name or number of interest with that printed on the MSDS. If they don't match, call your manufacturer or distributor and tell them you want one that was prepared *for* the product of interest. Don't accept substitute MSDSs; the manufacturer is required by law to have an MSDS for every product that they manufacture.

### Section I - Manufacturer Information

This section tells about the manufacturer of the product and should include their name, address, and normal and emergency telephone numbers. Additionally, there is supposed to be a date when the MSDS was prepared, and who prepared it. Verify that the date of the MSDS is somewhat recent. If you suspect that there might have been a later MSDS prepared, or it is a very old date, call the manufacturer at the number provided and ask for the latest MSDS release for your product. In fact, if you have *any* questions, call the manufacturer at the number provided. You can usually call the manufacturer at the designated number and get updated or additional MSDSs, or in many cases, they will FAX you the most recent version.

If there is a health or safety emergency at your facility with a particular product, call the emergency number for specific assistance.

Section I	- Manufacturer Information
Section II	- Hazardous Ingredients
Section III	- Physical Characteristics
Section IV	- Fire & Explosion Data
Section V	- Reactivity Data
Section VI	- Health Hazard Data
Section VII	- Precautions for Handling
Section VIII	- Control Measures

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<b>Section V — Reactivity Data</b>		
Stability	Unstable	Conditions to Avoid
	Stable	
Incompatibility (Materials to Avoid)		
Hazardous Decomposition or Byproducts		
Hazardous Polymerization	May Occur	Conditions to Avoid
	Will Not Occur	
<b>Section VI — Health Hazard Data</b>		
Routes of Entry	Inhalation?	Skin?
		Ingestion?
Health Hazards (Acute and Chronic)		
Carcinogenicity	NTP?	IARC Monographs?
		OSHA Required?
Signs and Symptoms of Exposure		
Medical Conditions		
Generally Aggravated by Exposure		
Emergency and First Aid Procedures		
<b>Section VII — Precautions for Safe Handling and Use</b>		
Steps to Be Taken in Case Material is Released or Spilled		
Waste Disposal Method		
Precautions to Be Taken in Handling and Storing		
Other Precautions		
<b>Section VIII — Control Measures</b>		
Respiratory Protection (Specify Type)		
Ventilation	Local Exhaust	Special
	Mechanical (General)	Other
Protective Gloves		Eye Protection
Other Protective Clothing or Equipment		
Work Hygiene Practices		

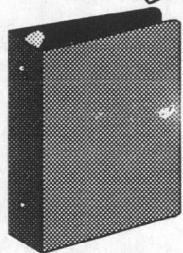
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## Material Safety Data Sheet

OSHA Form 174

### MSDSs Are Critical to Your Facility

- Obtain most current for each product -
- Understand what chemicals you're buying -
- Keep it readily available for employees -
- Take appropriate health precautions -
- Take appropriate safety precautions -
- Use to help determine waste category -



Your OSHA Hazard  
Communication Program



## Section II - Hazardous Ingredients/Identity Information

This is one of the most important sections of the MSDS when you are evaluating products for potential use at your facility. The manufacturer is required by law to list every chemical substance that is regulated by federal environmental regulations, and in some cases, selected states, that are in the product. If the manufacturer states that there are no regulated substances used, it is usually safe to assume you can use it in your operations and not be concerned about environmental regulations. Remember, the manufacturer is only required to list those substances that are *regulated*.

If there are substances listed in this section, you must look carefully at what it says. For example, you will find some chemical name or synonyms, its Chemical Abstract Service (CAS) number, and supporting information, including a percentage of that substance that is contained in the total volume of product. You may not recognize the chemical by the name used, and remember that one chemical can go by several names. However, the CAS number of a chemical always remains the same. If you are a chemist or are familiar with the more common regulated chemicals, you can make decisions by recognizing the name. The safer method of MSDS evaluation is to use the CAS number. All federal and most state environmental regulations, and supporting technical assistance publications include the CAS number with the chemical name. Compare the CAS number on the MSDS with those of the regulations to determine just how a substance in a product might be regulated.

To make this evaluation simpler, you can obtain, free of charge, the following EPA document: *"Title III List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-know Act (EPCRA) and Section 112(r) of the Clean Air Act, As Amended, Title III of the Superfund Amendments and Reauthorization Act of 1986, and Title III of the Clean Air Act Amendments of 1990,"* EPA 740-R-95-001. Call the EPCRA Hotline at (1-800) 424-9346 to get your free copy. One useful aspect of this document is that there are tables listing the chemical name alphabetically with the CAS Number, and another table listed numerically by CAS Number with the chemical name.

Another document you should obtain is the *"NIOSH Pocket Guide to Chemical Hazards,"* published by the U.S. Department of Health and Human Services. This document can be obtained from the Government Printing Office for a nominal cost, or contact your Field Area Office for assistance. This handy publication lists many chemicals by name and CAS Number, and has considerable information on the chemical's synonyms, trade names and conversion factors, personal protection, health hazards, respirator requirements, chemical and physical properties, and exposure limits. If you have a CAS Number and don't know the chemical name, this publication has a CAS Name index. If you have the chemical name but not the CAS Number, it has a chemical name index.

In many MSDSs, the manufacturer will list the percentage of the total product for each hazardous substance. This is valuable in preparing your mass balance and waste stream models. For example, if you bought a gallon of a product that had 15% of a particular substance, you may release 0.15 gallons of that substance as a waste (air, water, or land) for each gallon used (unless the substance becomes a part of another product you pro-

duce). Sometimes you will find a range of percentages so the manufacturer can avoid disclosing the exact formula; use the highest percentage in your mass balance.

Section II will also include OSHA REL and ACGIH TLV values for each hazardous substance contained in that product. The OSHA REL is the recommended exposure limits (RELs) for that substance. These are usually time-weighted averages (TWA) concentrations for up to a 10-hour workday during a 40-hour workweek. The ACGIH TLV is the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value which refers to the airborne concentrations of substances and represents an exposure level under which most people can consistently work for 8-hour days without harmful effects. Refer to your NIOSH pocket guide for more complete explanations and health hazard explanations.

### Section III - Physical/Chemical Characteristics

This section gives the physical description of the product, including the boiling point, vapor pressure, vapor density, specific gravity, melting point, evaporation rate, solubility in water, and appearance and odor. This is another important section as you develop your pollution prevention mass balance.

If you know the volume (e.g., gallons) of a hazardous material or substance, you will need to know the weight. This can be calculated by multiplying the specific gravity by the weight of one gallon of water (8.34). By our example above, if the specific gravity is 1.24, and you released 0.15 gallons, you can determine the following: each gallon of product weighs about 10.3 pounds, and you released about 1.5 pounds of the hazardous substance (as calculated by volume). Of course this is just an approximation, but it is a quick way to develop your mass balances. If the specific gravity is less than one, the product will float on water. If the specific gravity is larger than one, water will float on the product.

The solubility in water value is the amount of the product that will dissolve in water at room temperature. It is usually expressed as a percentage, or by a qualitative notation:

negligible	less than 0.1%
slight	0.1% to 1%
moderate	1% to 10%
appreciable	more than 10%
complete	100%

### Section IV - Fire and Explosion Hazard Data

This section is primarily intended for your safety office to make sure they understand the fire and explosion characteristics of the product. However, the flashpoint information is a very important parameter in your environmental management and pollution prevention activities. Recall that a waste that has a flashpoint of 140°F or less is a characteristic hazardous waste, *regardless* of what it may contain. This means that if you buy a product that has no hazardous substances listed, and it has a flash point of 140° F or less, any wastes will have to be classified as hazardous. Therefore, in selecting products, make

sure they don't contain hazardous substances, *and* make sure the flash point is greater than 140°F.

#### **Section V - Reactivity Data**

This is an important section with regard to how to handle the product and possible wastes. This section is of particular interest to your facility safety personnel for storage and handling considerations.

#### **Section VI - Health Hazard Data**

This section is reserved for detailed information on the health concerns that the product may have. Safety personnel are especially concerned with this to ensure proper management of the safety protection devices for workers.

#### **Section VII - Precautions for Safe Handling and Use**

This section is reserved for detailed information on the safe handling, transfer, and storage concerns that the product may have. Safety personnel are especially concerned with this to ensure proper management of facility safety.

#### **Section VIII - Control Measures**

This section is reserved for detailed information on personal protection that may be needed for that product. Safety and health personnel are especially concerned with this to ensure proper management of the safety protection of workers.



## 12. Chemical Hazard Communication Program

About 32 million workers are potentially exposed to one or more chemical hazards. There are an estimated 575,000 existing chemical products, and hundreds of new ones being introduced annually. This poses a serious problem for exposed workers and their employers.

Chemical exposure may cause or contribute to many serious health effects such as heart ailments, kidney and lung damage, sterility, cancer, burns, and rashes. Some chemicals may also be safety hazards and have the potential to cause fires and explosions and other serious accidents.

Because of the seriousness of these safety and health problems, and because many employers and employees know little or nothing about them, the Occupational Safety and Health Administration (OSHA) has issued a rule called "Chemical Hazard Communication." The basic goal of the standard is to be sure employers and employees know about work hazards and how to protect themselves. This should help to reduce the incidence of chemical source illness and injuries.

The Hazard Communication Standard establishes uniform requirements to make sure that the hazards of all chemicals imported into, produced, or used in the United States workplaces are evaluated, and that this hazard information is transmitted to affected employers and exposed employees.

Chemical manufacturers and importers must convey the hazard information they learn from their evaluations to downstream employers by means of labels on containers and material safety data sheets (MSDSs). In addition, all covered employers must have a hazard communication program to get this information to their employees through labels on containers, MSDSs, and training.

This program ensures that all employers receive the information they need to inform and train their employees properly and to design and put in place employee protection programs. It also provides necessary hazard information to employees, so they can participate in, and support, the protective measures in place at their workplaces.

The Hazard Communication Standard is different from other OSHA health rules as it covers *all* hazardous chemicals. The rule incorporates a "downstream flow of responsibility of information" which means that producers of chemicals have the primary responsibility for generating and disseminating information, while users of chemicals must obtain the information and transmit it to their own employees.

### *Hazard Evaluation*

The quality of your Hazard Communication Program depends on the adequacy and accuracy of the hazard assessment. Chemical manufacturers and importers are required

to review available scientific evidence concerning the hazards of the chemicals they produce or import, and to report the information they find to their employees and to employers who distribute or use their products.

The chemical manufacturers, importers, and any employers who choose to evaluate hazards are responsible for the quality of the hazards determinations they perform. Each chemical must be evaluated for its potential to cause adverse health effects and its potential to pose physical hazards such as flammability.

### ***Written Hazard Communication Program***

The first requirement to this chemical regulation dictates that employers must develop, implement, and maintain at the workplace a written, comprehensive hazard communication program. Most hazard communication programs include provisions for container labeling, collection and availability of material safety data sheets, and the training program. Your hazard communication program should include a list of hazardous chemicals in each work area and the means used to inform employees of the hazards of non-routine tasks. Your program needs to inform all contractors of potential chemical hazards and available protective measures.

The original written Hazard Communication Program should be maintained at the safety or environmental office. All employees should have access to copies of this program at established "safety bulletin boards" throughout the park. You should establish and maintain a list of the location of all "safety bulletin boards;" this list should also be made available to all employees and contractors.

## 13. Health Hazards

While safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (e.g., flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body - such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees - such as shortness of breath, a measurable but sometimes subjective feeling. Employees exposed to such hazards must be apprised of both this change in body function and the signs and symptoms that may occur to signal that change.

The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in non-occupationally exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely seen in the population at large, such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

There have always been attempts to categorize effects and to define them in various ways. Generally, the terms "acute" and "chronic" are used to delineate between effects on the basis of severity or duration. "Acute" effects usually occur rapidly as a result of short-term exposures, and are of short duration. "Chronic" effects generally occur as a result of long-term exposure, and are of long duration.

The acute effects referred to most frequently are those defined by the American National Safety Institute (ANSI) standard for Precautionary Labeling of Hazardous Industrial Chemicals (Z129.1-1982) - irritation, corrosivity, sensitization, and lethal dose. Although these are important health effects, they do not adequately cover the considerable range of acute effects which may occur as a result of occupational exposure, such as, for example, narcosis.

Similarly, the term chronic effect is often used to cover only carcinogenicity, teratogenicity, and mutagenicity. These effects are obviously a concern in the workplace, but again, do not adequately cover the area of chronic effects, excluding, for example, blood dyscrasias (such as anemia), chronic bronchitis, and liver atrophy.

The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. This does not negate the need for employees to be informed of such effects and protected from them.

The environmental or safety officer of each Park should review the MSDS of each new product delivered to the Park. This review should, at a minimum, identify all potential health risks for employees, and appropriate safety considerations. This information should be made available to all supervisors and posted on the safety bulletin boards, and incorporated into the Hazard Communication Program.

#### **Health Term Definitions**

Angiosarcomas:	Rapidly growing and destructive cancer of the lymphatics.
Blood dyscrasias:	A blood disorder such as anemia (i.e., a condition in which the blood is deficient in red blood cells, in hemoglobin, or in total volume.
Carcinogenicity:	The state of a substance or agent producing or inciting cancer.
Liver atrophy:	A decreasing in size or wasting away of the liver.
Mutagenicity:	the property of a chemical that causes the genetic characteristics of an organism to change in such a way that future generations are permanently affected.
Narcosis:	A state of stupor, unconsciousness, or arrested activity produced by the influence of narcotics or other chemicals.
Teratogenicity:	A state, or relating to, causing developmental malformations and monstrosities.



## 14. Preparing for and Preventing Accidents

**W**henver you generate hazardous waste and store it on-site, you must take the precautions and steps necessary to prevent any sudden or accidental release to the environment. This means that you must carefully operate and maintain your facility to reduce the possibility of fire, explosion, or release of hazardous materials and wastes.

Your facility must have appropriate types of emergency communication and fire equipment for the kinds of waste handled at your site. You must also attempt to make arrangements with local fire, public, or hospital officials as needed to ensure that they will be able to respond to any potential emergencies that could arise. Some of the steps you may need to take to prepare for emergencies at your facility include:

- Installing and maintaining emergency equipment such as alarms, telephones or two-way portable radios, fire extinguishers (using water, foam, inert gas, or dry chemicals as appropriate to your waste type), hoses, automatic sprinklers, or spray equipment in your facility so that it is immediately available to your employees if there is an emergency.
- Providing enough room for emergency equipment and response teams to get into any area in your facility in the event of an emergency.
- Writing to local fire, police, and hospital officials or state or local emergency response teams explaining the types of wastes you handle and asking for their cooperation and assistance in handling emergency situations.
- Provide a formal Hazardous Waste training program to Park employees who deal with hazardous materials.

## 15. Planning for Emergencies

An emergency contingency plan is a plan that attempts to look ahead and prepare for any accidents that could possibly occur. It can be thought of as a set of answers to a series of “what if” questions. For example: “*What if* there is a fire in the area where hazardous waste is stored?” or “*What if* I have a spill of hazardous waste or one of my containers leaks?” Emergency procedures are the steps you should follow if you have an emergency, that is, if one of the “contingencies” or “what ifs” occurs. While a specific written contingency plan is not required, it may be a good idea to make a list of these questions and answer them on paper. This also may be helpful in informing your employees about their responsibilities in the event of an emergency. If you have an emergency:

- In the event of a *fire*, call the fire department and attempt to extinguish it using the appropriate type of fire extinguisher.
- In the event of a *spill*, contain the flow of hazardous waste to the extent possible and notify the National Response Center. The Center operates a 24-hour toll free number: 1-800-424-8802. As soon as possible, clean up the hazardous waste and any contaminated materials and soil.
- In the event of a *fire, explosion or other release*, immediately notify the National Response Center as required by Superfund regulations. (Superfund is the law that deals with the cleanup of spills and leaks of hazardous waste at abandoned hazardous waste sites.)

Emergency phone numbers and locations of emergency equipment must be posted near telephones and all employees must know proper waste handling and emergency procedures. You must appoint an employee to act as *emergency coordinator* to ensure that emergency procedures are carried out in the event an emergency arises. An emergency coordinator must be available 24 hours a day (at the facility or by telephone), and that person must know whom to contact and what steps to follow in an emergency.

It is important to avoid potential risks in this area. If you have a serious emergency and you have to call your local fire department or you have a spill that extends outside your facility or that could reach surface waters, *immediately call the National Response Center (1-800-424-8802) and give them the information they ask for*. If you didn't need to call, they will tell you so. *But anyone who was supposed to call and does not is subject to a \$10,000 fine and a year in jail, or both.*

## 16. Sample Environmental Policy Statements

The following are sample facility statements that convey management commitment to the concepts of pollution prevention. Such a policy statement is critical to facility acceptance and support of the NPS Park Environment 2000 Initiative.

### Policy Statement Example 1

The \_\_\_\_\_ (National Park Service) is committed to excellence and leadership in protecting the environment. In keeping with this policy, our objective is to reduce waste and emissions. We strive to minimize adverse impact on the air, water, and land through pollution prevention and energy conservation. By successfully preventing pollution at its source, we can achieve cost savings, increase operational efficiencies, improve the quality of our services, maintain a safe and healthy workplace for our employees, and improve the environment. \_\_\_\_\_ (National Park Service) environmental guidelines include the following:

- Environmental protection is everyone's responsibility. It is valued and displays commitment to \_\_\_\_\_ (National Park Service).
- We will commit to including pollution prevention and energy conservation in all our services and operations.
- Preventing pollution by reducing and eliminating the generation of waste and emissions at the source is a prime consideration in our operations. \_\_\_\_\_ (National Park Service) is committed to identifying and implementing pollution prevention opportunities through encouraging and involving all employees
- Technologies and methods which substitute non-hazardous materials and utilize other source reduction approaches will be given top priority in addressing all environmental issues.
- \_\_\_\_\_ (National Park Service) seeks to demonstrate its responsible citizenship by adhering to all environmental regulations. We promote cooperation and coordination between industry, government, and the public toward the shared goals of prevention pollution at its source.

### Policy Statement Example 2

At \_\_\_\_\_ (National Park Service), protecting the environment is a high priority. We are pledged to eliminate or reduce our use of toxic substances and to minimize our use of energy and generation of all wastes, whenever possible. Prevention of pollution at the source is the preferred alternative. When waste cannot be avoided, we are committed to recycling, treatment, and disposal in ways that minimize undesirable effects on air, water, and land.

## 17. Aerosol Spray Cans: An Alternative Look

As part of your fluids management program, it has been recommended that all fluids be purchased in bulk and NOT in aerosol spray can form. There are now several manufacturers who produce effective aerosol spray can “look-alikes”. Biomatik USA Corporation produces a polypropylene hand held, air-powered dispenser of bulk chemicals that is now being used as a key element in pollution prevention programs. This unique item is safe to use, requires no special tools or fixtures, can be reused, and is inexpensive and convenient. The primary pollution prevention advantages of this aerosol spray alternative includes:

- Elimination of aerosol and other limited-life dispenser cans and bottles; a potentially costly waste stream.
- Completely environmentally safe through the use of compressed air - uses no hazardous or undesired propellant.
- Can be recharged so all product can be used – eliminates waste product in sealed (aerosol) cans when propellant is exhausted.
- Can easily be reused many times, thereby eliminating spent aerosol cans and potentially hazardous wastes through unused RCRA-defined hazardous substances left in sealed cans.
- Can “host” many different products (light oils, chemicals, solvents, water, etc.). Caution must be exercised to verify bottle-substance compatibility to ensure long-term bottle integrity.
- Can be charged using built-in hand pump, or using standard (90 psi) compressed air lines.
- Rugged polypropylene construction for light to heavy industrial applications. Has the same general form as most aerosol canisters of today.
- Spray nozzles can easily be changed, with a wide variety of spray patterns available to match specific dispensing needs.
- Significantly more economical with a full six ounce product capacity compared to less than eight product ounces in 16-ounce aerosol containers.

National Distributor: Biomatik USA  
c/o Stark and Associates  
North Carolina 28202  
(704) 332-5004



## **V. Land Management Issues**

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# 1. Xeriscape

**L**awn care requires significant resources (water, energy, labor) to maintain, and improved landscape design can minimize the use of resources while maintaining a yard's aesthetic value. Xeriscape is a form of landscape design that encourages water and energy efficiency. It relies upon seven basic principles: (1) proper planning and design; (2) appropriate use of turf; (3) efficient irrigation; (4) soil improvements; (5) mulching; (6) appropriate plant selection; and (7) maintenance to reduce water needs.

**1. Planning and design:** Low water use zones should be in low activity areas. In some high-use areas, turf is necessary and will most likely be in a moderate water use zone.

**2. Appropriate use of turf:** Achieving a significant reduction in landscape water consumption and maintenance can be done by reducing the size of water-sensitive lawns, and replacing them with shrub beds and groundcovers. Lawn areas should serve a useful purpose, such as erosion control or play areas. Irregular, hard-to-maintain shapes are difficult to mow and irrigate.

**3. Efficient irrigation:** Drip irrigation can be used for shrub and tree areas that require less water than grass. If plants are grouped according to their water needs, they can be watered more efficiently.

**4. Soil improvements:** The ideal soil for water and oxygen requirements of plant roots is one which takes water readily, permits easy movement through the root zone and retains approximately 25% water after drainage while permitting free drainage from pores occupying approximately 25% of the soil by volume (Dr. Murry Milford, National Xeriscape News, January/February, 1988). Mixing organic materials with soil increases porosity and, with decomposition, tends to improve aggregation. Such materials are most beneficial as mulches left on the soil surface where they impede evaporative losses of water while being porous enough to permit water to filter through.

**5. Mulching:** A mulch is a protective covering of various substances, especially organic, placed around plants to prevent evaporation of moisture, freezing of roots, and control of weeds. The general recommendation (Lorraine Billeaud, National Xeriscape News, March/April, 1988) is three to four inches of an organic mulch for best results. Grass clippings would create a very effective mulch.

**6. Appropriate plant selection:** Plants should be selected and grouped according to their water, sun, and temperature needs. Many low water use plants exhibit vibrant color.

**7. Appropriate maintenance:** Regular maintenance preserves the beauty of the landscape. However, xeriscape changes usually result in decreased

maintenance. Less time is required for mowing if turf area is decreased, plants require minimal weeding and watering, irrigation management reduces watering time, and mulches improve soil quality. Mowing grass at the proper height (e.g., Saint Augustine at three inches, Bermuda and Zoysia at one inch) can conserve water (Douglas Welsch, National Xeriscape News, September/October, 1988). Mowing at relatively tall heights allows the grass to develop a deeper, more water-efficient root system. Taller grass blades also act as a living mulch, shading the ground and reducing soil moisture evaporation. As the grass grows taller, it grows slower and matures, thus requiring less water and mowing. Finally, applying fertilizer to the lawn at the proper time and in the proper amount (one to two pounds of nitrogen fertilizer per 1,000 square feet of lawn at one time, once in the spring and again in the fall) can save time, effort, and money by reduced mowing and watering.

According to Robb Swearingin (National Xeriscape News, November/December, 1987), water savings of 10% to 25% is possible in almost any existing landscape simply by managing an irrigation system more efficiently. With a few modifications to the system and improved horticultural practices such as adding mulches, pruning, trimming and repairing or replacing worn, damaged or improperly installed equipment, the savings can be increased into the 40% range. According to Douglas Welsh (National Xeriscape News, September/October 1988), a well-designed xeriscape can decrease maintenance by as much as 50%.

Gradual changes can have long-term resource savings. One way to reduce lawn care is to simply stop mowing, and create manicured meadows. This suggestion would work for areas that receive little traffic, in areas with large trees, where it would be aesthetically pleasing. Replacing high-maintenance flower beds with more drought-resistant plants and weed barrier fabric underneath can substantially reduce maintenance requirements for weeding and watering.

Reseeding turf areas could result in significantly lower costs for mowing (equipment maintenance and labor) and watering. Some grass varieties require minimal or no mowing because they grow so slowly. Several varieties survive with minimal water. It would cost about \$3,000 to \$4,000 per acre to hydroseed a new kind of grass, and \$1,500 to \$2,000 per acre to reseed with a more tolerant grass mixture. Both of these methods would require weakening or killing the previous grass with Round-Up before applying. The difference between these two methods derives entirely from the mulch system. Hydroseeding has a sprayed mulch over the seed and fertilizer that is very effective in retaining moisture and preventing wind damage to the germinating seeds. Reseeding requires another mulch source – hay, grass clippings, etc. that must be applied by the facility lawn crew.

For more information, contact your local water department (e.g., the Denver Water Department has extensive educational materials on Xeriscape), your state's land grant college extension service, as well as the Boulder Energy Conservation Center.



## 2. Herbicides, Pesticides, and Insecticides

An almost unlimited number of pesticides and herbicides are available for agricultural and yard use. The relative toxicity to animals, persistence in soil, and transport capabilities all influence the relative danger of these substances. The best choice is one that has a low transport potential, a short half-life, and a low acute toxicity. When choosing a herbicide, pesticide, or insecticide, these characteristics can be used as a basis for comparisons and selection.

This summary identifies most of the commonly used herbicides, pesticides, and insecticides together with some specific information on their active ingredients, intended use, possible environmental hazards, and application alerts. This list does not constitute an endorsement for any of these products. Consult your state or regional pollution prevention contact for less hazardous or nonhazardous alternatives for your specific objective.

In the following list, pesticides marked "Restricted Use" should no longer be used. Every pesticide, no matter what its hazard, should be applied according to the directions. Products that contain the following chemicals should be substituted for one that does not: Furadan, Gromoxone, and Diazinon; if products containing these chemicals are used, you must carefully follow the application directions.

### *Accent Sp (DuPont)*

**Active Ingredient:** Nicosulfuron

**Use:** Herbicide for corn, General Use classification

**Environmental Hazards:** Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment rinsewater. Do not apply where or when conditions could favor runoff. Do not apply if a severe storm is expected within 24 hours.

**Application:** Apply Accent Sp at the rate of one soluble packet (2-2/3 ounces) per four treated acres for selective post emergence grass weed control. Apply Accent Sp when grasses are young and actively growing. For later-emerging weeds, a second application or a timely cultivation is required. Applications must include either a crop oil concentrate or a nonionic surfactant. The addition of ammonium nitrogen fertilizer is recommended. Accent Sp is rainfast in four hours.

**Banvel (Sandoz Agro, Incorporated)**

**Active Ingredient:** Dimethylamine salt of dicamba (3,6-dichloro-o-anisic acid)

**Use:** Herbicide for corn, General Use classification for most products

**Environmental Hazards:** For terrestrial uses, do not apply directly to water, or to areas where surface water is present. Do not contaminate water when disposing of equipment rinsewaters.

**Application:** Do not treat areas where either possible downward movement into soil or surface washing may cause contact of Banvel herbicide with the roots of desirable plants such as trees and shrubs. Apply only as directed.

**Brom**

**Active Ingredient:** Bromacil

**Use:** Herbicide for grasses and brush control, General Use classification

**Environmental Hazards:** Bromacil is highly toxic, but the product applied is usually very dilute. Bromacil binds lightly to particles, and can be transported readily through soil. It has a long half-life (60 days). Off-site leaching is the primary route by which it leaves the soil (National Pesticide Telecommunications Network).

**Captan**

**Active Ingredient:** Captan

**Use:** Fungicide, General Use

**Environmental Hazards:** Captan has a short persistence in soil (a half-life of one to ten days). It is not mobile, and was not detected by the EPA's nationwide groundwater pesticide survey. Most use on food crops is now banned because captan can cause cancer in laboratory animals (National Pesticide Telecommunications Network).

**Curtail (DowElanco)**

**Active Ingredient:** Clopyralid 3,6-dichloro-2-pyridinecarboxylic acid, alkalamine salts of the ethanol and isopropanol series (7.5%), 2,4-dichlorophenoxyacetic acid, triisopropanolamine salt (38.4%)

**Use:** Herbicide for non-cropland, General Use classification for all products.

**Environmental Hazards:** Drift or runoff may adversely affect non-target plants. Do not apply directly to water, or to areas where surface water is present. Do not contaminate water when disposing of equipment rinsewater. Clopyralid is a chemical which can travel (seep or leach) through soil and under certain conditions contaminate groundwater which may be used for irrigation or drinking purposes. Users are advised not to apply clopyralid where soils have a rapid to very rapid permeability throughout the profile (such as loamy sand or sand) and the water table of an underlying aquifer is shallow, or to soils containing sinkholes over limestone bedrock, severely fractured surfaces, and substrates which would allow direct introduction into an aquifer.

**Application:** Curtail herbicide is recommended for selective, post emergence control of broadleaf weeds in wheat and barley not under-seeded with a legume, fallow cropland, rangeland and permanent grass pastures, land in the Conservation Reserve Program, and non-cropland. Apply only once per 12-month period, except for grass grown for seed. This product can affect susceptible broadleaf plants directly through foliage and indirectly by root uptake from treated soil. Therefore, do not apply Curtail directly to or allow spray drift to come in contact with alfalfa, or other desirable broadleaf crops.

#### **Dzn Diazinon 14G (Ciba)**

**Active Ingredient:** Diazinon

**Use:** Insecticide, Restricted Use classification, due to avian and aquatic toxicity

**Environmental Hazards:** This product is highly toxic to birds, fish, and other wildlife. Birds, especially waterfowl, feeding or drinking on treated areas may be killed. Application rates above those recommended significantly increase potential hazards to birds and waterfowl. Keep out of lakes, streams, and ponds. Do not apply directly to water, or to areas where surface water is present. Drift and runoff may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water by cleaning of equipment or disposal of equipment rinsewater.

**Application:** The EPA concluded that the hazard to birds from diazanon use on golf courses and sod farms outweighs the minor benefits, and that cancellation was the only appropriate action. The EPA is concerned about the hazard to birds from diazinon use on other sites (EPA Pesticide Fact Sheet, September 1986).

**Dureban**

**Active Ingredient:** Chlorpyrifors

**Use:** Pesticide, General Use classification

**Environmental Hazards:** Chlorpyrifors is highly toxic to aquatic organisms, but its potential for mobilization is low because it breaks down quickly, and it attaches strongly to soil.

**Furadan 4F (FMC Corporation)**

**Active Ingredient:** Carbofuran (44%)

**Use:** Insecticide-nematicide, Restricted Use classification

**Environmental Hazards:** This product is toxic to fish, birds and other wildlife. Birds feeding on treated ares may be killed. For waterfowl protection, do not apply immediately before or during irrigation, or on fields in proximity to waterfowl nesting areas, or on fields where waterfowl are known to repeatedly feed. Drift and runoff from treated areas may be hazardous to fish in neighboring areas. The use of Furadan 4F may pose a hazard to federally designated endangered or threatened species known to be found in certain areas: Attwater's Greater Prairie Chicken, Aleutian Canada Goose, and Kern Primrose Sphinx Moth. This product is highly toxic to bees exposed to direct treatment or residues on crops. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area. Carbofuran is a chemical which can travel (seep or leach) through soil and can contaminate groundwater which may be used as drinking water. Carbofuran has been found in groundwater as a result of agricultural use. Users are advised not to apply carbofuran where the water table is close to the surface and where the soils are very permeable (loamy sands).

Based upon data on acute health effects, the acute oral hazard of carbofuran is the same order of magnitude as fonophos, phorate, and terbufos, but is less than aldicarb, and greater than the other major alternatives. The environmental fate data indicate that carbofuran is highly mobile and has a potential to leach. The EPA concluded that in general carbofuran poses the greatest risk to birds as compared with other granular pesticides, including its alternatives. The EPA proposed to cancel granular carbofuran use on all sites because the risk to birds outweighs the benefits of use (EPA Pesticide Fact Sheet, No. 189, 1989).

**Gromoxone Extra (Zeneca)**

**Active Ingredient:** Paraquat dichloride

**Use:** Herbicide for weed and grass, Restricted Use classification because of high mammalian toxicity

**Environmental Hazards:** This product is toxic to wildlife. Do not apply directly to water or to areas where surface water is present. Gromoxone Extra herbicide is a contact herbicide that kills all green plant tissue. Do not apply under conditions involving possible drift to food, forage or other plantings that might be damaged. Do not apply when weather conditions favor drift from areas treated. Clay and organic matter rapidly tie up Gromoxone Extra. As a result, it has no residual soil activity to affect later-planted crops or later-germinating weeds. Because it is rapidly absorbed by the weed foliage, rain occurring 30 minutes or more after application will have no effect on the activity of Gromoxone Extra.

**Application:** Gromoxone Extra should be applied to emerged weeds when they are small. Weeds one inch to six inches in height are the easiest to control. Larger weeds may be more difficult to control. In dry areas, dust stirred up by high winds or equipment tires can coat weed leaves and reduce Gromoxone Extra activity. Avoid applying in extremely dusty conditions. For alfalfa, rate per acre varies depending on growth stage, but about two pints per acre at the most is reasonable. Less than two pints per acre is the rate for corn. These refer to the broadcast rates, which mean 3/8 fluid ounces added to one gallon.

**Malathion**

**Active Ingredient:** Malathion

**Use:** Insecticide, General Use classification

**Environmental Hazards:** This pesticide is toxic to fish, aquatic invertebrates, and aquatic life stages of amphibians. Do not apply directly to water or to areas where surface water is present. Drift and runoff may be hazardous to aquatic organisms in areas near the application site. Do not contaminate water when disposing of equipment rinsewater. This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Degradation in soil is rapid and related to the degree of adsorption. In raw river water, the half-life was less than one week, whereas malathion remained stable in distilled water for three weeks.

### **Orthoklor**

**Active Ingredient:** Chlorpyrifos

**Use:** Pesticide, General Use classification

**Environmental Hazards:** Chlorpyrifos is highly toxic to aquatic organisms, but it breaks down quickly. It attaches strongly to soil particles, so mobilization danger is low (National Pesticide Telecommunications Network).

### **ProMagic**

**Active Ingredient:** Tetramethrin, d-phenothrin

**Use:** Insecticide, General Use classification

**Environmental Hazards:** The primary environmental concern is for aquatic organisms, if it is directly applied to water.

### **Roundup (Monsanto Company)**

**Active Ingredient:** Glyphosate, n-(phosphonomethyl) glycine, in the form of its isopropylamine salt

**Use:** Herbicide, General Use classification for most products

**Environmental Hazards:** Do not apply directly to water, to areas where surface water is present. Do not contaminate water when disposing of equipment rinsewater. Glyphosate has moderate persistence with a typical field half-life of 47 days. All crops can be planted immediately after application due to strong adsorption to soil.

**Application:** Avoid contact with foliage, green stems, exposed non-woody roots or fruit or crops, desirable plants and trees, since severe injury or destruction may result. Rainfall or irrigation occurring within six hours after application may reduce effectiveness. Heavy rainfall or irrigation within two hours after application may wash the chemical off the foliage and a repeat treatment may be required. Avoid drift. Extreme care must be used when applying this product to prevent injury to desirable plants and crops. For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff. When using in less than complete coverage, use a 5% solution (five quart to 25 gallons) for annual and perennial weeds and a 5 to 10% solution for woody brush and trees.

**Valent X-77**

**Active Ingredient:** Diquat dibromide

**Use:** Herbicide, General Use classification

**Environmental Hazards:** Valent X-77 is a moderately toxic chemical, to which cows are particularly sensitive. However, it leaves no trace in plant, soil, or water. It is strongly adsorbed to most soil particles, so there is a small potential for groundwater or surface water contamination (National Pesticide Telecommunications Network).

**Weedmaster (Sandoz Agro)**

**Active Ingredient:** Dimethylamine salt of dicamba, and dimethylamine salt of 2,4-dichlorophenoxyacetic acid

**Use:** Herbicide, General Use classification for most products.

**Environmental Hazards:** This product is toxic to aquatic invertebrates. Drift or runoff may adversely affect aquatic invertebrates and nontarget plants. Do not apply directly to water, or to areas where surface water is present. Most cases of groundwater contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites.

**Application:** Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of groundwater supplies. Use of closed systems for mixing or transferring this pesticide will reduce the probability of spills. Do not treat areas where either possible downward movement into soil or surface washing may cause contact of Weedmaster Herbicide with the roots of desirable plants such as trees and shrubs.

**2,4-D**

**Active Ingredient:** 2,4-Dichlorophenoxyacetic acid

**Use:** Broadleaf Herbicide, General Use classification

**Environmental Hazards:** This product is toxic to fish. Drift or runoff may adversely affect fish and non-target plants. Do not apply to water or to areas where surface water is present. Do not contaminate water when disposing of equipment rinsewater. Do not contaminate water used for irrigation or domestic purposes. 2,4-D is potentially mobile, but rapid degradation in soil and removal from soil by plant uptake minimizes leaching. It undergoes microbial breakdown in warm, moist soil. Rate of breakdown increases with increased temperature, moisture, pH, and organic matter content.

**Application:** Most cases of groundwater contamination involving 2,4-D have been associated with mixing/loading and disposal sites. Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of groundwater supplies.

#### **Fertilizer/Pesticide Storage and Handling**

Storage facilities should be a secured, single-use area, separate from other activities and storage (feed, seed, and fuel). Federal law requires that concentrated pesticides be stored in a secured area. Therefore, outdoor storage containers should be located within a permanently fenced area. Whenever possible, you should minimize storage of chemicals to avoid the associated risks (CSU Cooperative Extension, Best Management Practices for Pesticide and Fertilizer Storage and Handling, August, 1994).





## **VI. Supporting Information**

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## Definitions/Glossary

Acid	a corrosive solution with a pH less than 7.
Acutely Hazardous Waste	waste that EPA has determined to be so dangerous in small amounts that they are regulated the same way as are large amounts of other hazardous wastes. Examples include certain pesticides and dioxin-containing waste.
Angiosarcomas	rapidly growing and destructive cancer of the lymphatics.
Blood Dyscrasias	a blood disorder such as anemia (i.e., a condition in which the blood is deficient in red blood cells, in hemoglobin, or in total volume).
Boiler	means an enclosed device using controlled flame combustion and having the following characteristics <ul style="list-style-type: none"><li>(i) The unit has physical provisions for recovering and exporting energy in the form of steam, heated fluids, or heated gases;</li><li>(ii) The unit's combustion chamber and primary energy recovery section(s) are of integral design (i.e., they are physically formed into one manufactured or assembled unit);</li><li>(iii) The unit continuously maintains an energy recovery efficiency of at least 60 percent, calculated in terms of the recovered energy compared with the thermal value of the fuel;</li><li>(iv) The unit exports and utilizes at least 75 percent of the recovered energy, calculated on an annual basis (excluding recovered heat used internally in the same unit, for example, to pre-</li></ul>

heat fuel or combustion air or drive fans or feed-water pumps); and

(v) The unit is one which the Regional Administrator has determined on a case-by-case basis, to be a boiler after considering the standards in 40 CFR 260.32.

Burner	means the owner or operator of any boiler or industrial furnace that burns hazardous waste fuel for energy recovery and that is not regulated as a RCRA hazardous waste incinerator.
Carcinogenicity	the state of a substance or agent producing or inciting cancer.
Chemical	means any element, chemical compound, or mixture of elements and/or compounds.
Chemical name	means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazardous evaluation.
Combustible liquid	means any liquid having a flashpoint at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.
Common name	means any designation or identification such as code name, code number, trade name, brand name, or generic name used to identify a chemical other than by its chemical name.

Compressed gas

means:

- (i) a gas or mixture of gases having, in a container, an absolute pressure exceeding 40 pounds per square inch (psi) at 70°F (21.1°C); or
- (ii) a gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C); or
- (iii) a liquid having a vapor pressure exceeding 40 psi at 100°F (37.8°C) as determined by ASTM D-323-72.

Disposal

means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into on on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

Container

means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

Distributor

means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

Employee

means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.

Employer	means a person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.
EPA Identification Number	means the number assigned by EPA to each generator, transporter, and treatment, storage, or disposal installation.
Explosive	means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.
Exposure/exposed	means that an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact, or absorption, etc.), and includes potential (e.g., accidental or possible) exposure.
Flammable	<p>means a chemical that falls into one of the following categories:</p> <ul style="list-style-type: none"><li>(i) “aerosol, flammable” means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;</li><li>(ii) “gas, flammable” means:<ul style="list-style-type: none"><li>(a) a gas that at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent (13%) by volume or less; or</li><li>(b) a gas that at ambient temperature and pressure, forms a range of flammable mixture with air wider than 12 percent (12%) by volume, regardless of the lower limit.</li></ul></li></ul>

(iii) "liquid, flammable" means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent (99%) or more of the total volume of the mixture;

(iv) "solid, flammable" means a solid, other than a blasting agent or explosive as defined in §190-109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

## Flashpoint

means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (see American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.245 - 1979 (ASTM D55-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(ii) Pensky-Martens Closed Tester, (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7 - 1979 (ASTM D93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids,

or that have a tendency to form a surface film under test; or

(iii) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D3278-78)). Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

Foreseeable emergency

means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

Generator

means any person, by site, whose act or process produces hazardous waste identified or listed in 40 CFR Part 261.

Hazardous chemical

means any chemical which is a physical hazard or a health hazard.

Hazard warning

means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the hazard(s) of the chemical(s) in the container(s).

Hazardous waste

means a hazardous waste as defined in 40 CFR 261.3.

Hazardous waste fuel

means hazardous waste and any fuel that contains hazardous waste that is burned for energy recovery in a boiler or industrial furnace that is not subject to regulation as a RCRA hazardous waste incinerator. However, the following hazardous waste fuels are subject to regulation as used oil fuels:

- (i) Used oil fuel burned for energy recovery that is also a hazardous waste solely because it



exhibits a characteristic of hazardous waste identified in Subpart C of 40 CFR Part 261; and

(ii) Used oil fuel mixed with hazardous wastes generated by a small quantity generator subject to 40 CFR 261.5.

#### Health hazard

means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes.

#### Identity

means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

#### Industrial boiler

means a boiler located on the site of an installation engaged in manufacturing process where substances are transformed into new products, including the component parts of products, by mechanical or chemical processes.

#### Industrial furnace

means any of the following enclosed devices that are integral components of manufacturing processes and that use controlled flame combustion to accomplish recovery of materials or energy: cement kilns, lime kilns, aggregate kilns (including asphalt kilns), phosphate kilns, coke ovens, blast furnaces, smelting furnaces, refining furnaces, titanium dioxide-chloride process oxidation reactors, methane reforming furnaces, pulping liquor recovery furnaces, combustion

	devices used in the recovery of sulfur values from spent sulfuric acid, and other devices as the Administrator of EPA may add to this list.
Label	means any written, printed, or graphic material, displayed on or affixed to containers of hazardous chemicals.
Liver Atrophy	a decreasing in size or wasting away of the liver.
Mutagenicity	the property of a chemical that causes the genetic characteristics of an organism to change in such a way that future generations are permanently affected.
Mixture	means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.
Off-specification used oil fuel	means used oil fuel that does not meet the specification provided under 40 CFR 279.11.
Organic peroxide	means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.
Oxidizer	means a chemical other than a blasting agent or explosive as defined in §1910.109(a), that initiates or promotes combustion in other material thereby causing combustion either of itself or through the release of oxygen or other gases.
Physical hazard	means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.
Pyrophoric	means a chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

Recycling	means if a material is used, reused, or reclaimed (40 CFR 261.1(c)(7)).
Source reduction	means any activity that reduces or eliminates the generation of hazardous or solid waste at the source, usually within a process (e.g., product substitution, process changes, housekeeping).
Storage	means the holding of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed of, or stored elsewhere.
Teratogenicity	a state, or relating to, causing developmental malformations and monstrosities.
Transportation	means the movement of hazardous waste by air, rail, highway, or water.
Transporter	means a person engaged in the off-site transportation of hazardous waste by air, rail, highway, or water.
Treatment	means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste nonhazardous, or less hazardous; safer to transport, store or dispose of; or amenable for recovery, amenable for storage, or reduced in volume. Such term includes any activity or processing designed to change the physical form or composition of hazardous waste so as to render it non-hazardous.
Trade secret	means any confidential formula, patent, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it.

Used oil	means any oil that has been refined from crude oil, or any synthetic oil, that has been used, and as a result of such use, is contaminated by physical or chemical impurities.
Unstable (reactive)	means that a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure, or temperature.
Waste minimization	<p>means the reduction, to the extent feasible, of hazardous waste that is generated or subsequently treated, stored or disposed of. It includes any source reduction or recycling activity undertaken by a generator that results in either:</p> <ul style="list-style-type: none"><li>(i) the reduction of total volume or quantity of hazardous waste; or</li><li>(ii) the reduction of toxicity of the hazardous waste, or both, so long as such reduction is consistent with the goal of minimizing present and future threats to human health and the environment.</li></ul>
Water-reactive	means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

## Abbreviations and Acronyms

AD	Estimated average electric demand
AD	area x depth
ANSI	American National Safety Institute
ASTM	American Society of Testing and Materials
BLM	Bureau of Land Management
BMP	Best management practices
Btu	British thermal unit
C <sub>1</sub>	Conversion factor: 0.03413 therms per kWh
CAA	Clean Air Act
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESQG	Conditionally-Exempt Small Quantity Generator
CFC	Chlorofluorocarbon
CES	Community Energy Services Recycling, Riverton, Wyoming
CFR	Code of Federal Regulations
CSU	Colorado State University
CWA	Clean Water Act
DEQ	Department of Environmental Quality
DOT	United States Department of Transportation
ECS	Energy cost savings
EFF <sub>e</sub>	Efficiency of existing electric heater
EFF <sub>g</sub>	Efficiency of gas-fired heater
EMS	Environmental Management System
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-know Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
HazCom	OSHA Hazard Communication
HMTCA	Hazardous Materials Transportation Act
ICM	Integrated Crop Management
IPM	Integrated Pest Management
kW	kilowatt (1,000 watts)
kWh	kilowatt-hours
lb/A	pounds per acre
IUPAC	International Union of Pure and Applied Chemists
LED	Light emitting diode
LEPA	low-energy precision application
LEPC	Local Emergency Planning Committee

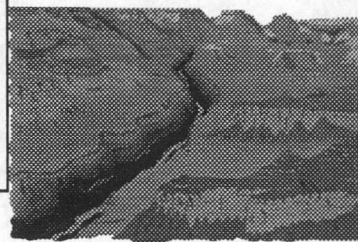
LQG	Large Quantity Generator
M	Mega (one million)
MM Btu	Million Btu
MSDS	Material Safety Data Sheet
N	Nitrogen
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standard for Hazardous Air Pollutant
NFPA	National Fire Protection Association
NO <sub>3</sub>	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Society
OSHA	Occupational Safety and health Administration
PCB	Polychlorinated biphenyl
POTW	Public Owned Treatment Works
ppm	Parts per million
psi	Pounds per square inch
Q	Estimated heating load in kWh per year
QT	flow x time
RCRA	Resource Conservation and Recovery Act
PPA	Pollution Prevention Act
SDWA	Safe Drinking Water Act
SERC	State Emergency Response Commission
SIC	Standard Industrial Classification Code
SIP	State Implementation Plan
SPCC	Spill Prevention, Control and Countermeasure Plan
SQG	Small Quantity Generator
TSCA	Toxic Substance Control Act
TQM	Total Quality Management
UCD	Average electric demand rate (dollars per kW)
UCE	Average electric energy rate per kWh (in dollars)
UCG	Average gas rate (in dollars per therm)
UL™	Underwriter's Laboratory
USDA	United States Department of Agriculture
UST	Underground Storage Tank
VOC	Volatile organic compound
WQDP	Water Quality Demonstration Project

## Pollution Prevention and Environmental Assistance

This Environmental Management tool kit was prepared especially for those national parks within the National Park Service Intermountain Field Area. Please see the other supporting document for an integrated approach to your environmental management program and the achievement of the goals of **Park Environment 2000 Initiative!**

**Environmental Management for the National Park Service: A Tool Kit for Environmental Management** is designed to guide you through the 14 most common waste streams at national parks and identify management reduction possibilities.

### ENVIRONMENTAL MANAGEMENT FOR THE NATIONAL PARK SERVICE

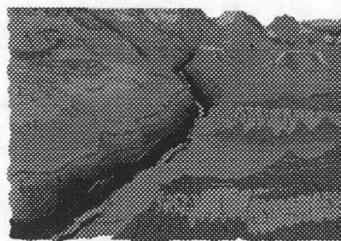


Part 1 of the Environmental Management

Environmental Protection Agency Region VIII  
NPS Intermountain Field Area Office  
Partnership Project

EPA

### NATIONAL PARK SERVICE ENVIRONMENTAL RESOURCE MANUAL

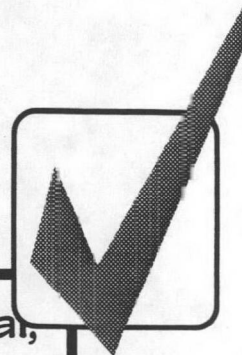


Resource Manual for Environmental Management

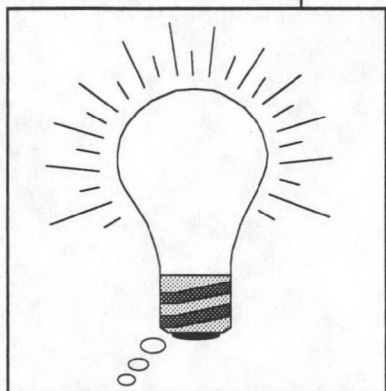
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EPA

**The National Park Service Environmental Resource Manual** will provide you with quick references to products and equipment suppliers and service providers. Remember, make all choices keeping in mind the principles of source reduction.



**There are many sources for technical, compliance, and financial assistance. Use them to your advantage!**



Pollution prevention contacts at EPA's regional offices.

Professional and trade associations.

Trade journals and environmental publications.

Local and regional universities specializing in pollution prevention.

Technical consultants and non-profit assistance.

Department of Energy and Small Business Administration.

Federal, state, and special topic pollution prevention clearinghouses and on-line databases.

**Your best source for all forms of assistance and referral are pollution prevention programs at the local, state, and federal level. They are there to assist you in decreasing your environmental footprint. Use them!**



**This environmental management tool kit is a part of a series that has been prepared for a variety of organizations and is available to support local, state, and federal source reduction programs.**

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Recom is a small business that has been advancing the concept of pollution prevention since the 1980s. Recom works with organizations of all sizes, from all industries, offering pollution prevention programs, environmental management systems, and technical assistance. As a part of an integrated outreach program, Recom offers federal and state agency policy development and program integration, as well as training.



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