



Ecology's Current Pollution Prevention Program

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P2 Planning Chemical Regulatory Lists

- Toxics Release Inventory list (approx. 600)
- Montreal Protocol list (approx. 75 greenhouse gases)
- Hazardous Waste Lists
 - Some lists of specific chemicals...
 - ...but mainly not specifically named. Instead: "ignitable," "corrosive," reactive," etc


CAS Number	Chemical Name	TRI sample
115-28-6	Chlorendic acid	0.1
90982-32-4	Chlorimuron ethyl [Ethyl-2-[[[(4-chloro-6-methoxyprimidin-2-yl)amino]carbonyl]amino]sulfonyl]benzoate]	1.0
7782-50-5	Chlorine	1.0
10049-04-4	Chlorine dioxide	1.0
79-11-8	Chloroacetic acid	1.0
532-27-4	2-Chloroacetophenone	1.0
4080-31-3	1-(3-Chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride	1.0
106-47-8	p-Chloroaniline	0.1
108-90-7	Chlorobenzene	1.0

A sample of the list of “hazardous substances” for the federal Toxics Release Inventory and the state pollution prevention planning law.



Pollution Prevention Planning

- >2640 pounds of hazardous waste/year and/or TRI reporters required to plan
- ~ 600 current planning facilities
- Submittal of plan is mandatory, implementation is voluntary
- Annual Progress Reports and Five-Year Plan updates required



Source Reduction

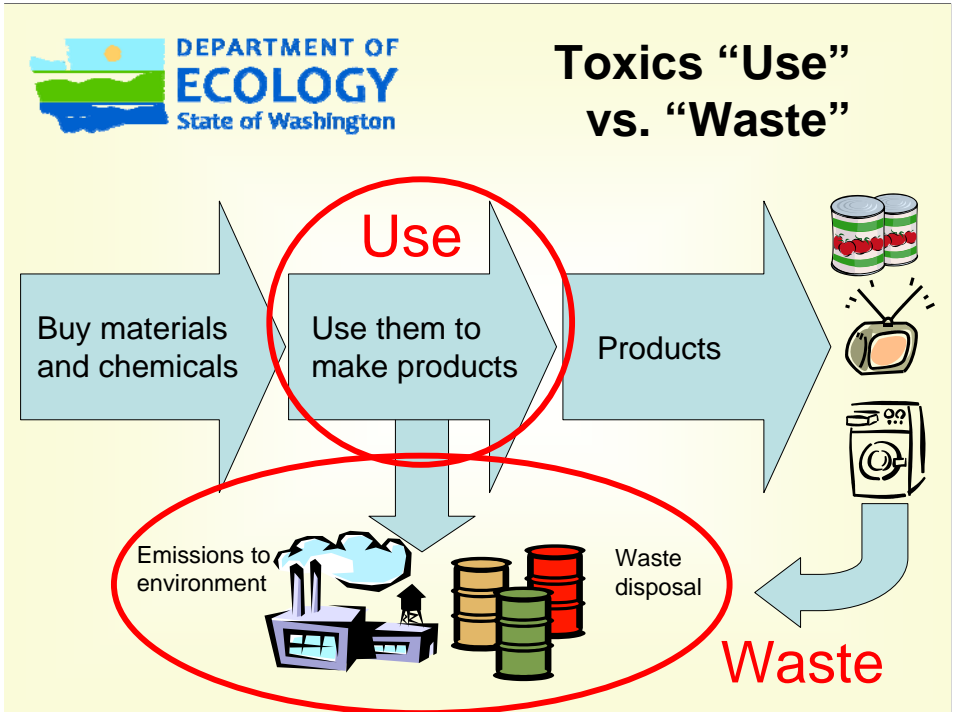
Reuse

Recycle

Treatment/ Disposal

Hazardous Waste Hierarchy

- Established in RCW 70.95C





- 1997—Environmental Management System Alternative to P2 Planning
 - Based on feedback from industry
 - ~ 50 facilities participating
- Participants: Boeing, U.S. Navy, Hexcel, Canyon Creek Cabinets, City of Seattle Parks Dept, Seattle City Light, Frito-Lay, etc.

Goal 12 Create a Facilities Services Hazardous Waste Manual.

Task Create a draft manual that covers issues such as proper hazardous waste management as well as BMPs for paint waste management, water disposal (and stormwater protection), and other topics.

Task Finalize and publish this manual for use by Facilities Services. Identify key FS representatives for “buy-in”.

Goal 13 Account for all spent photographic fixer and silver recovery; manage silver program to encourage owners of photocopiers to go digital”.

Task Use MyChem database and waste database, searching for fixer chemicals, to find all photographic systems.

Task Encourage photo processor operators to “go digital”, especially on the K wing group in the Health Sciences Building. This is a high priority but has been confounded by lack of ownership of the machines (they are mostly older machines and shared by a number of

Sample Environmental Management System report: tracking tasks and progress toward goals



Cleaner Production Challenge
A Voluntary Resource Conservation Effort
Final Report

A project which chose its participants on the basis of high waste amounts instead of high toxicity substance use.



People-on the phone and visiting—are rated the most helpful in surveys of our clients.

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Cabinet maker goes green and saves some green, too

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G.L.

Think. Plan.

NORTHWA

Lean & Green: The Dept of Ecology and Washington Manufacturing Services partnered to run three successful pilot tests of finding environmental wastes as well as the traditional lean manufacturing wastes.



Successful Technical Assistance Tools

- TREE (Technical Resources for Engineering Efficiency) Team
 - Multi-media collaboration with local air agencies, Water Quality Program, local sewer and water
- Since 1998 TREE has made suggestions to help companies annually save...
 - \$2.4 million
 - 206 million gallons of water
 - 229,000 pounds of hazardous waste

Pollution Prevention Plan

Facility Name: **Ace Galvanizing**
 Industry Type: Hot Dip Galvanizing
 NAIC Code: 332812
 EPA ID# or CRK#: IRF409005654
 Base Year: 2001

Description of Products and Services

Ace Galvanizing is a Hot-Dip galvanizing job shop, which means that all the material to be galvanized is fabricated by Ace's customers; Ace itself does not fabricate any items for resale. The company has two facilities, a 5-acre site in the South Park area, and a smaller facility in the Fremont area. The South Plant consists of one lay-down yard in the south end of the site where items to be galvanized are unloaded and stored, a second lay-down yard where material is stored after galvanizing, 2 warehouses, one production building with an enclosed tank farm on it's west side, and a "Pickle & Oil" deoxidation production line at the northwest corner of the site. The North Plant consists of two connected buildings, and one yard where both processed and unprocessed items are stored.

Based on site activities, Ace Galvanizing falls under the Standard Industrial Classification (SIC) of 3479 (Coating, Engraving, & allied services). Under the new North American Industry Classification System (NAICS), Ace is covered under the code 332812 (Metal coating, engraving & allied services). Typically, the facility operates 24 hours per day, 5 days per week, and maintains a staff of approximately 50 people.

Production Factor for APR (base year 1995) = 1.02

Production Level

Units	2001	2002	2003	2004	2005	2006
Tons of steel galvanized	14,269	15,997	13,088	16,469	14,828	0
Ratio	1.00	1.12	0.92	1.15	1.04	0.00

Previous Accomplishments

Sample Pollution Prevention Plan (start of first page only)

HAZARDOUS SUBSTANCES USED

Product Name	Ingredients (LBS)			2001	2002
UBZ7910	CAS #	%		324390	158211
	7440-39-3 BARIUM	20			
	N982 ZINC CMPNDS	15	- +		
ALP101	CAS #	%		65644	71176
	N982 ZINC CMPNDS	35			
	N040 BARIUM CMPNDS	40	- +		
UBZ7931	CAS #	%		60542	70963
	N982 ZINC CMPNDS	19			
	N040 BARIUM CMPNDS	16	- +		
BC4746S	CAS #	%		46805	56624
	N078 CADMIUM CMPNDS	20			
	N040 BARIUM CMPNDS	15	-		
	N982 ZINC CMPNDS	5	- +		

Sample P2 Plan: Keeping track of toxics ("hazardous substances" in the law)

Opportunity Rodine Acid Inhibitor [TOP](#) [Help](#)

Describe the opportunity: Acid inhibitors allow acid to dissolve oxidized iron while interfering with the reaction with the base metal. By doing this, we should be able to pickle more pounds of steel for each pound of sulfuric acid used. We have actually been using this for several years, increasing the amount of Rodine Acid Inhibitor each year.

Targeted Hazardous Products/Wastes: Sulfuric acid consumption

Observations:

Year	Observations
2002	The Rodine acid inhibitor, along with some improvements in rinsing technique helped to lower our sulfuric acid consumption from 14 pounds of acid per ton pickled in 2001 to 11 pounds of acid per ton pickled in 2002.
2003	For 2003, sulfuric consumption increased to 15 pounds per ton pickled. This could be due to inconsistent application of the Rodine inhibitor, change in type of steel we are pickling, or an increase in the amount of zinc stripping in the acid tanks. This matter is under investigation at the present time.
2004	We switched to a different acid inhibitor late in 2004, but had to discontinue its use and switch back to Rodine in July 2005. The product we tried, "Soprin Ironsave" was apparently rendered ineffective by the fluoride ion build up in our acid tanks. This buildup is a consequence of reusing the same acid for so many years.
2005	Probably as a result, Acid consumption was up to 16 pounds of acid per ton of steel processed in 2004. The effects of our inhibitor experiment will probably carry over. Sulfuric acid consumption was down by a small amount in 2005, however normal consumption was up to 17 pounds of acid per ton of steel processed. We are back to using the Rodine inhibitor, and hope to see decreased consumption for 2006.

Sample P2 Plan: An "opportunity," or idea for change

MENT, RECYCLING, RELEASES OR OTHER RESOURCE

Resource or Release (State Units)	2001	2002
Used: LPG - Propane (gallons)	20463	14566
Used: #2 Diesel Fuel (gallons)	430	2738
Oil - motor, hydraulic, transmission, clutch 7 lift trucks x 3,500 hrs. (lbs)	289	263
Used: All motor fuel (pounds)	90911	84603
Pounds Fuel / Production Factor	90911	75538
Pounds Fuel / Production Factor as % of base year	100	83
Fuel Expenses (dollars)	29411	18918

Sample P2 Plan: some facilities use the plan to keep track of resource use (optional)

Not all of table is shown, for screen legibility.

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Air Land Water Toxics Waste

BY PROGRAM

- Air Quality
- Environmental Assessment
- Hazardous Waste & Toxics Reduction**
- HW Management
- Reducing Waste
- Reporting Requirements
- Hazardous Chemicals in Your Community
- Program Info
- Databases & Publications

Nuclear Waste
Shorelands
Solid Waste
Spills
Toxics Cleanup
Water Quality
Water Resources

FIND INFO ABOUT

- Core Services
- Laws & Rules
- Publications & Forms
- Public Records
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Hazardous Waste & Toxics Reduction

Forging partnerships to prevent pollution and manage waste.



Welcome to the redesigned Hazardous Waste and Toxics Reduction Program homepage. [Let us know](#) if you have any comments.

WORKING TOGETHER
Reducing hazardous substance use & waste

Toxics Reduction Advisory Committee (TRAC)
Find out about this advisory group that will recommend changes in P2 Planning, waste reduction and Planning Fees.

Ecology Lends a Helping Hand
Ecology is helping health care facilities improve the way they dispose of pharmaceutical waste.

Business & Industry | **Home & Neighborhood** | **Workers & Workplace**

HAZARDOUS WASTE MANAGEMENT REQUIREMENTS
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REDUCING HAZARDOUS WASTE & SUBSTANCES
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The Hazardous Waste and Toxics Reduction web site has materials and contacts for a broad range of groups.

Home | About Us | Environmental Education | Public Input | News | Employment

Air Land Water Toxics Waste

BY PROGRAM

- Air Quality
- Environmental Assessment
- Hazardous Waste & Toxics Reduction**
- Nuclear Waste
- Shorelands
- Solid Waste
- Spills
- Toxics Cleanup
- Water Quality
- Water Resources

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- Core Services
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Search Results

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Search results for: pollution prevention ◀ **Displaying results**

[Pollution Prevention Progress for 23 Washington Electroplating Facilities: An Industry ...](#)
... **Pollution Prevention** Progress for 23 Washington Electroplating ... to promote further implementation of **pollution prevention** by sharing what has been ... electroplating, facilities, hazardous waste, industry, **pollution**, **pollution prevention**, **prevention**, sector, waste ... <http://www.ecv.wa.gov/biblio/96426.html> - Document size: 8.0KB

[Paint and Coatings Manufacturing Sector: A Pollution Prevention Assessment and Guidance](#)
... and Coatings Manufacturing Sector: A **Pollution Prevention Assessment and Guidance** ... from site visits, and future **pollution prevention** opportunities for this sector. It ... hazardous waste, paint, paint manufacturing, **pollution**, **pollution prevention**, **prevention**, reduction, sector, technical assistance, waste ... <http://www.ecv.wa.gov/biblio/98410.html> - Document size: 9.1KB

Example of pollution prevention publications. These two publications are compilations of ideas for reducing waste and complying with dangerous waste laws.

Offering Mistints and Off-Spec Products to Non-Profit Organizations

Schools, low-income developments, community projects and organizations often seek out material donations such as paint from businesses in the community.

Giving or Selling Overages on Custom Products to the Customer

Rather than keeping small overages of custom products, or trying to find another customer or use for them, many manufacturers are making an effort to give or sell small overages to the customer who ordered the product.

Using Re-Usable and Recyclable Containers

Some manufacturers actively pursue using recyclable containers for raw materials and finished product to reduce the generation of solid waste. (A common practice to some degree, it remains an area for future opportunity. See "Solid Waste" section, page 16).

Formulator Works With the Paint Maker

When manufacturing a new product for the first time, the formulator will work with the paint maker to limit the production of off-specification product.

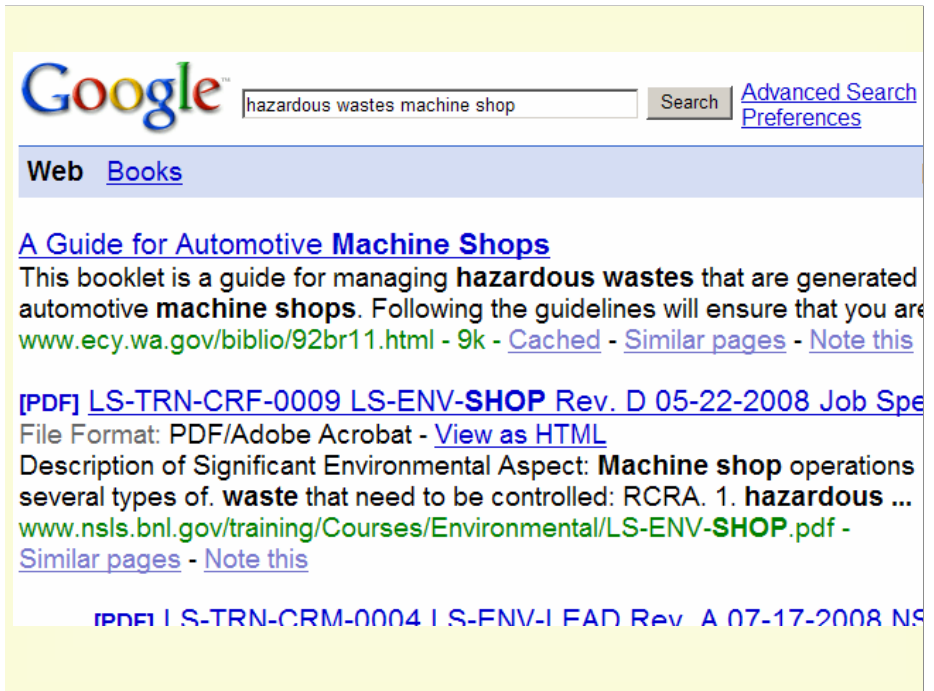
Clearly Indicating/Highlighting Formula Changes

To prevent producing off-spec products due to human error, manufacturers are taking steps to call attention to formula changes through highlighting or other indicators.

Using Re-Usable Bag, Metal, or Vortisieve Screens and Filters

A common practice for the reduction of solid waste from paint filtering is the use of re-usable rather than disposable filters.

Typical waste and toxics reduction opportunities list from an Ecology publication.



The screenshot shows a Google search interface. The search bar contains the text "hazardous wastes machine shop". To the right of the search bar is a "Search" button and links for "Advanced Search" and "Preferences". Below the search bar, there is a "Web Books" section. The top result is titled "A Guide for Automotive Machine Shops" and is a PDF document. The description of the document states: "This booklet is a guide for managing hazardous wastes that are generated automotive machine shops. Following the guidelines will ensure that you are...". Below the title and description, there are several links: "www.ecy.wa.gov/biblio/92br11.html - 9k - Cached - Similar pages - Note this", "[PDF] LS-TRN-CRF-0009 LS-ENV-SHOP Rev. D 05-22-2008 Job Spe", "File Format: PDF/Adobe Acrobat - View as HTML", "Description of Significant Environmental Aspect: Machine shop operations several types of. waste that need to be controlled: RCRA. 1. hazardous ...", "www.nsls.bnl.gov/training/Courses/Environmental/LS-ENV-SHOP.pdf - Similar pages - Note this", and "PDF | S-TRN-CRM-0004 | S-FNV-I FAD Rev A 07-17-2008 NS".

High Google results indicate a widely-popular and linked-to publication.

Medical Industry Waste Prevention Round Table

MIRT

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TOPICS:

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[Green Construction](#)

Bringing together professionals in the medical industry and government to exchange ideas on innovative practices and technologies to prevent and reduce waste - lab, solid, and hazardous - and conserve natural resources and energy.

"The information provided by MIRT has been invaluable as far as reducing waste and taking some of the mystery out of the whole process."

- Don Kilgore, Inland Northwest Health Services, Spokane

"Cost Savings - 50% reduction in the volume of lab waste, better price on batteries. Saved time and expense trying to get answers."

- Bill Montgomery, St. Joseph's Hospital - Bellingham

"Because of the information we learned... we are doing a hospital-wide inventory to determine what mercury-containing products we have so we can phase (them) out"

Ecology participates in many industry groups. A recent focus has been on the health care industry. Mercury reduction best practices, among many others, are shared in this group.



Interagency Resource for Achieving Cooperation

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About Us

Some Background Information:

The Interagency Resource for Achieving Cooperation (IRAC) was formed in 1992 to help resolve regulatory issues between and amongst regulatory agencies by developing consensus for resolving their specific regulatory concerns. Today, IRAC continues to provide a structure for regulators from numerous agencies to share their diverse perspectives as they work together resolving regulatory conflicts, gaps or overlaps. Through IRAC Workgroups our members have successfully introduced new legislation and have brought changes to local, state and national regulations and codes.

Our Purpose:

To provide a process and the tools for government agencies to develop, modify or clarify regulations protecting human health and the environment in the King County region.

Our Goals:

To facilitate opportunities for regulators to network with other regulators. To enable governmental agencies to speak with one voice while providing clear environmental and regulatory direction which best meets the needs of the region.

IRAC's Advisory Committee is currently made up of representatives from the following agencies:

- [Environmental Protection Agency](#)
- [Port of Seattle](#)
- [Puget Sound Clean Air Agency](#)
- [Seattle Public Utilities – Surface Water Quality](#)
- [King County Department of Natural Resource & Parks – Solid Waste](#)
- [King County Department of Natural Resource & Parks – Hazardous Waste](#)
- [Northshore Fire Department](#)
- [Washington State Department of Ecology](#)
- [Washington State Department of Labor & Industries](#)

Intergovernmental work groups provide one coordinated response to issues.

Survey sent to planners	1995	1998	2002 N=40
How helpful was the planning process?	3.3	3.4	3.5
Hours to prepare plan	100	66	17
How helpful was Ecology staff?	4.2	4	4.5
How many P2 opportunities do you expect to implement?	Not asked	2.8	2.7
Do you expect to save money through implementation?	Not asked	Not asked	2.6

First three questions:

1 = Not at all, 3 = Somewhat, 5 = Very

Last two questions:

1 = None, 3 = Some, 5 = Lots



Specialty Products, Inc

As a result of our technical assistance in developing and implementing their first Pollution Prevention Plan:

Eliminated m-xylene

'Non-cancer human health impact' factor = 0.42 kg-toluene equivalent/kg

Ecotoxicity factor = 1.92 kg 2,4-D/kg

Replaced it with dimethyl adipate (dibasic ester)

'Non-cancer human health impact' = zero

Ecotoxicity factor = zero.

Example of technical assistance by Ecology staff: reformulation of solvent using values from EPA's TRACI model.