greenUP!

Metal

Manufacturers & Finishers

Green Certification

Part of a cooperative Agreement
Form the U.S. EPA

Training and Technical Assistance
By
Zero Waste Enterprises, LLC

Acknowledge Course Sponsors

greenUP!

NEVADA
Industry Excellence
"YOUR STRATEGIC GROWTH PARTNER"

P2 NATIONAL POLLUTION PREVENTION ROUNDTABLE

LA SANITATION environment
CITY OF LOS ANGELES

Schedule – Wednesdays 9am-10:30am (PT)

Introduction to Metal Finishing Environmental Certification

Week 1: Introduction - "Finding the Hidden Profits in Environmental Stewardship"

Week 2: Success Stories - "Real World Examples from the Metal Manufacturing Industry "

Successful Metal Manufacturing Environmental Practices

Week 3: Best Management Practices for Metal Finishing

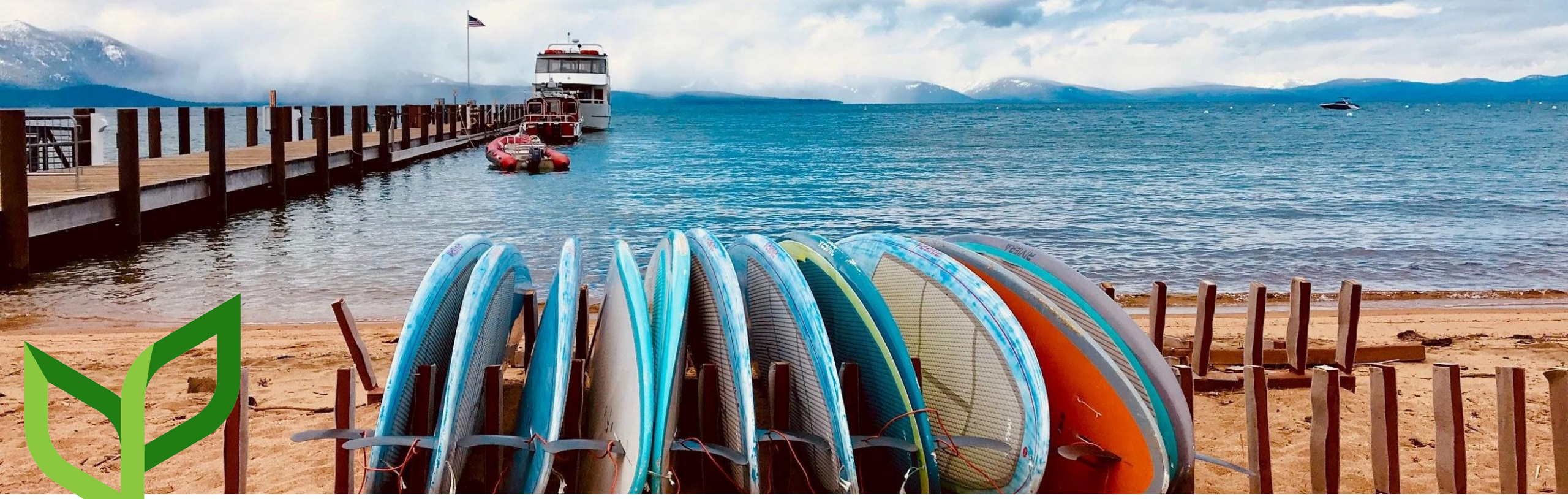
Week 4: Best Management Practices for Cutting Fluids and other issues - "More Metal Manufacturing Best Management Practices"

Lean and Environmental Training for Metal Finishing

Week 5: Solvent Issues - "Safer Alternatives in Solvent Applications for Metal Processing"

Week 6: Lean Manufacturing Techniques – Using Lean Manufacturing to uncover opportunities.

Week 7: Lean Practices and Success Stories



PROTECT ENVIRONMENT.

Conserve natural resources and protect air and water quality.

SAVE MONEY.

Reduce energy, water, and waste for cost savings and improved efficiency.

BUILD LOW-CARBON ECONOMY.

Alternatives to drive-alone commutes lower carbon emissions.

IMPROVE EMPLOYEE WELLNESS.

Non-toxic cleaning supplies protect employee health.

GAIN A MARKETING EDGE.

Attract 70% consumers that support support green businesses.

Instructor
Thomas Vinson

Zero Waste Enterprises,
In Partnership with greenUP!

As part of a cooperative agreement with

The United States Environmental Protection Agency's
Source Reduction Grant 2021

greenUP!

Course 1: Introduction

- Who we are
- Why we are here
- Benefits of Participation
  - Manage/Reduce Regulatory Burden
  - Eliminate Risks
  - Improve profitability

Course 1: Introduction

- Course Overview
  - A sample of our training
  - Core courses
  - Electives
- Customize Your Training
  - Self paced/Live Hybrid
  - Custom courses based on needs

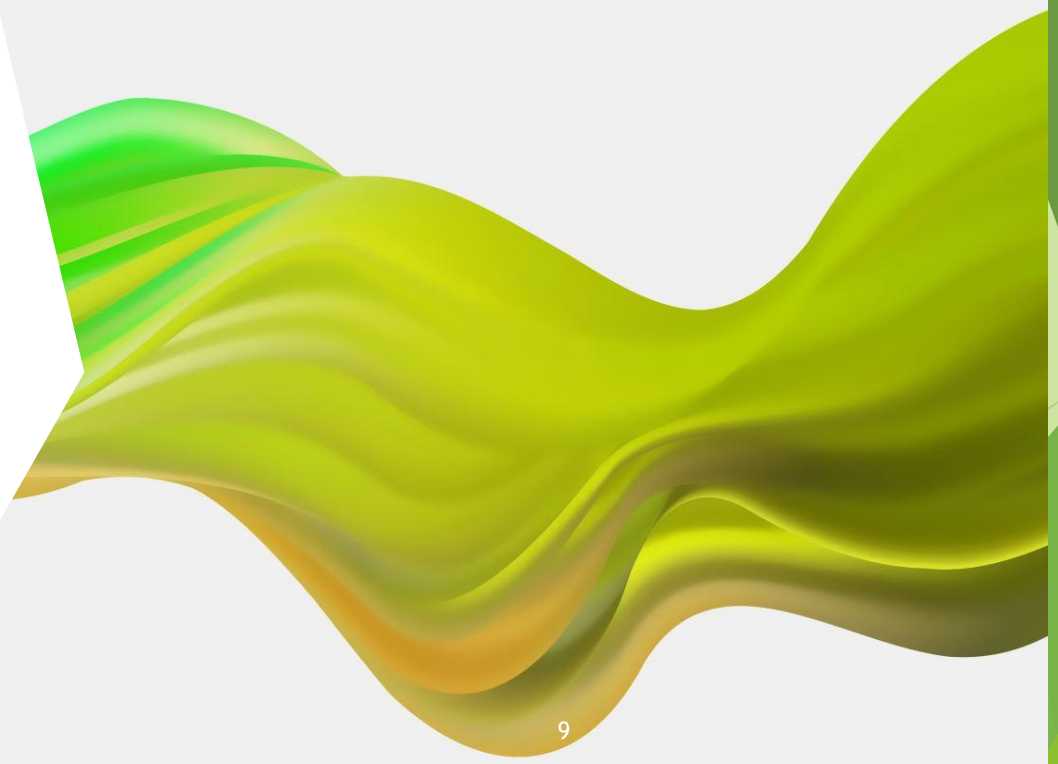
Over $5,000 Worth
of
Training at

NO COST to you.

Introduce Yourself!

- Name
- Title
- Company
- Type of industry

Why Are We Here?



Business and Environment

All businesses rely on resources from the environment

Utilizing the resources efficiently is one way to improve your business performance

Challenges a Business Faces

- Compliance with environmental inspections and regulations
- Managing Risks
  - Hazardous materials
  - Safety
  - Regulatory Risks
- Marketplace competitiveness
  - Customer expectations
  - Rapidly changing economy

A Good Environmental Program Will:

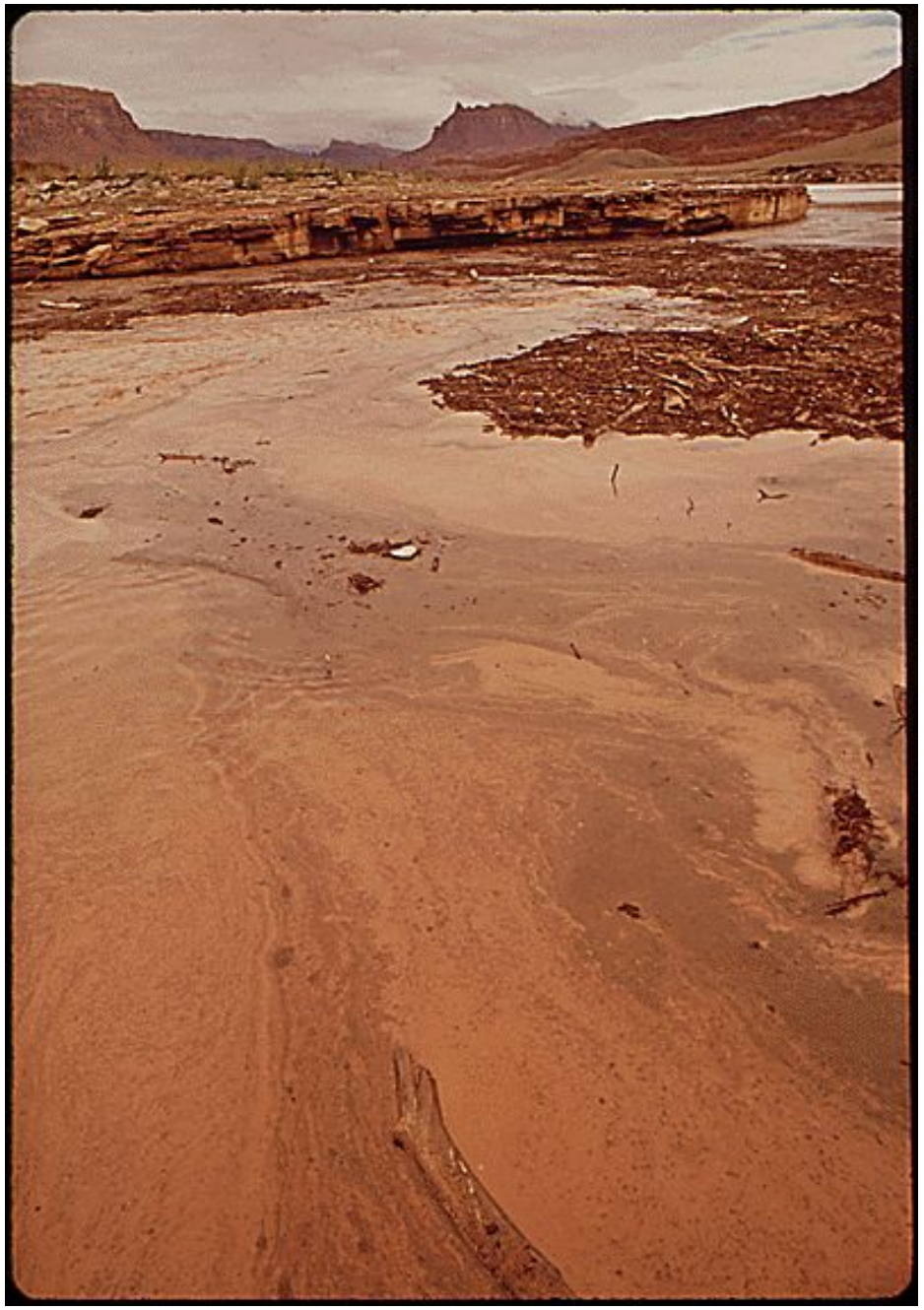
- Save Money
  - Yes, save,
  - even make money
- Lower Your Risk
- Help you Achieve Your Goals
  - Improve operating efficiency (Lean)
  - Improve employee morale
  - Enhance public image

Beyond Compliance

Compliance issues as a business opportunity

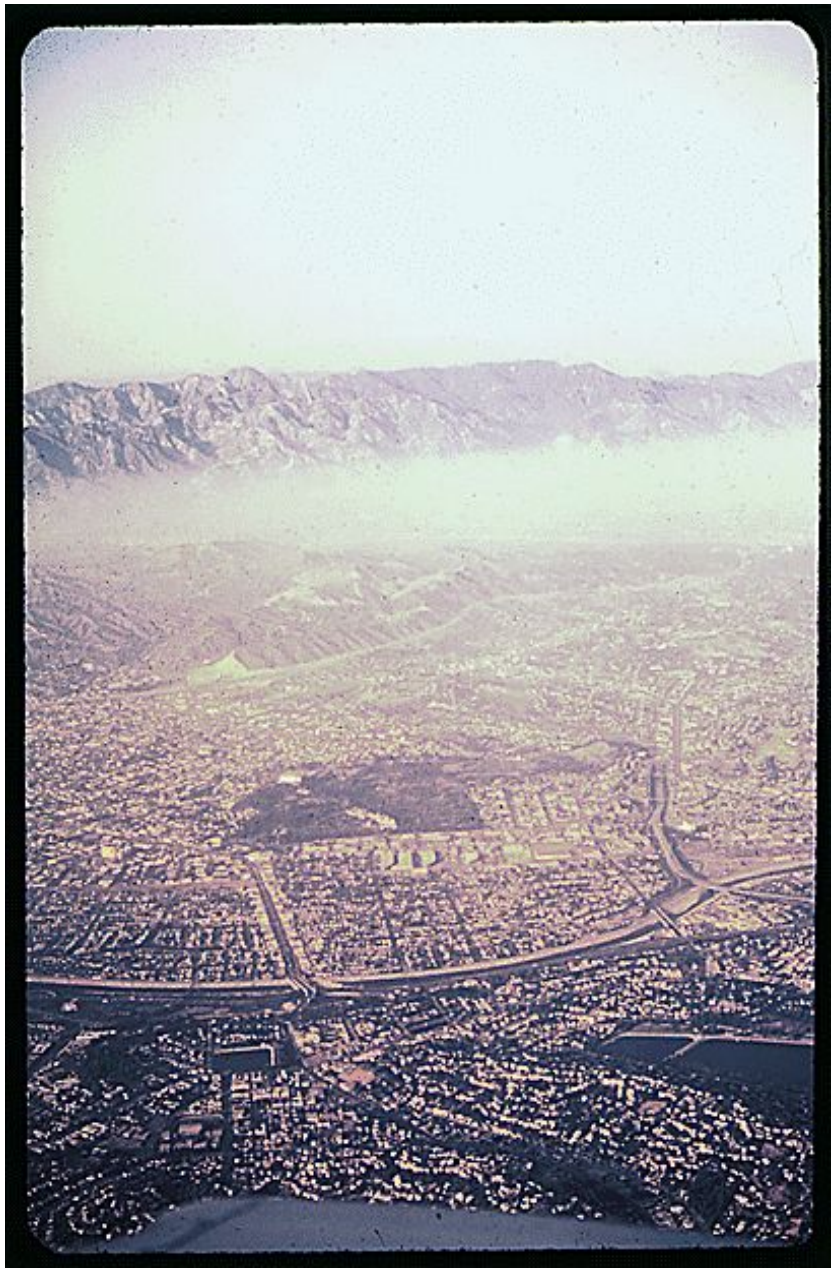
"Born in the wake of elevated concern about environmental pollution, EPA was established on December 2, 1970 to consolidate in one agency a variety of federal research, monitoring, standard-setting and enforcement activities to ensure environmental protection. Since its inception, EPA has been working for a cleaner, healthier environment for the American people."

Epa.gov/history



Oil in water of this *canyon near Lake Powell, Utah, is the result of an oil spill on the San Juan River* more than 200 miles away.

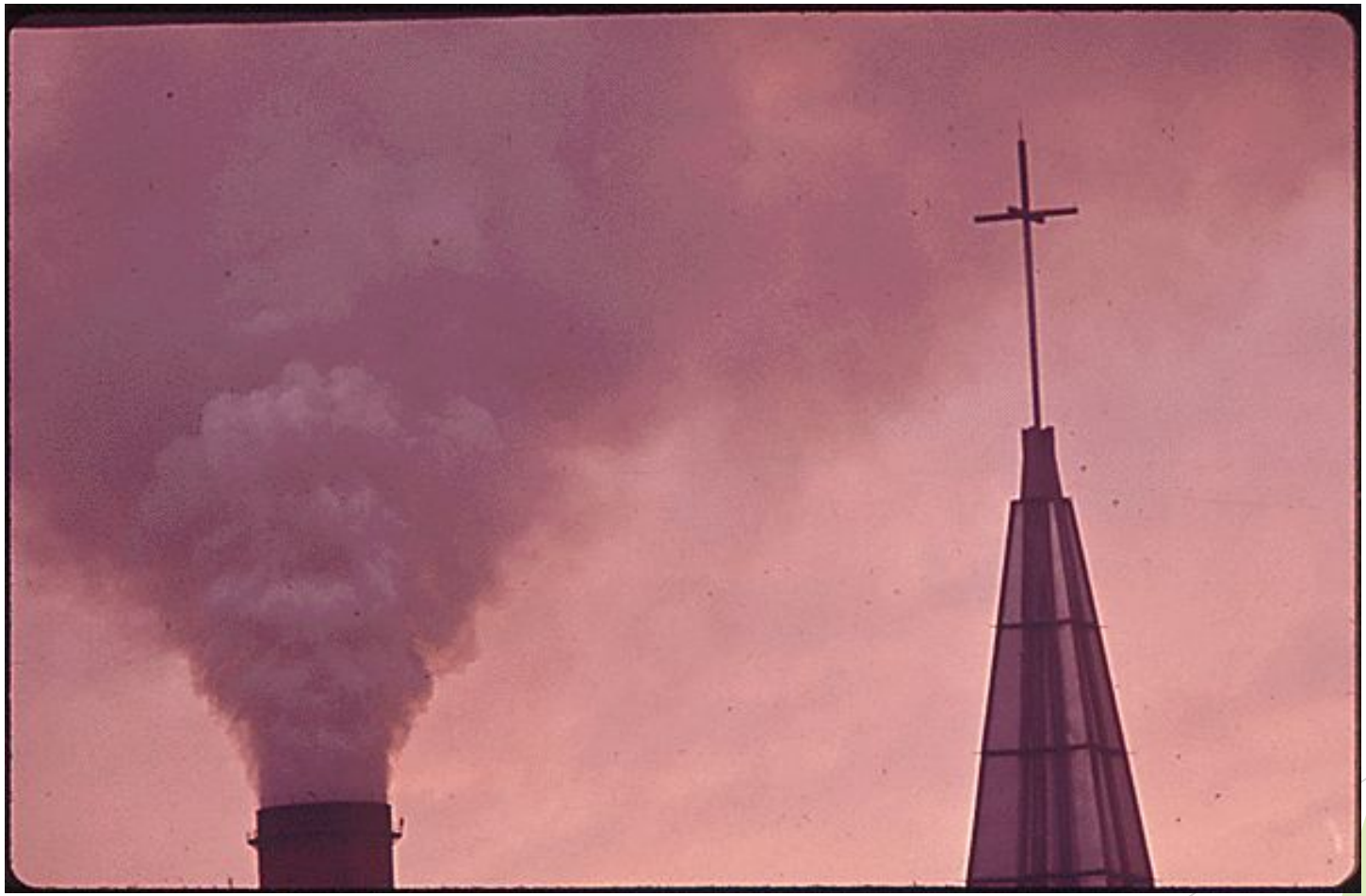
October 1972; photo by David Hiser



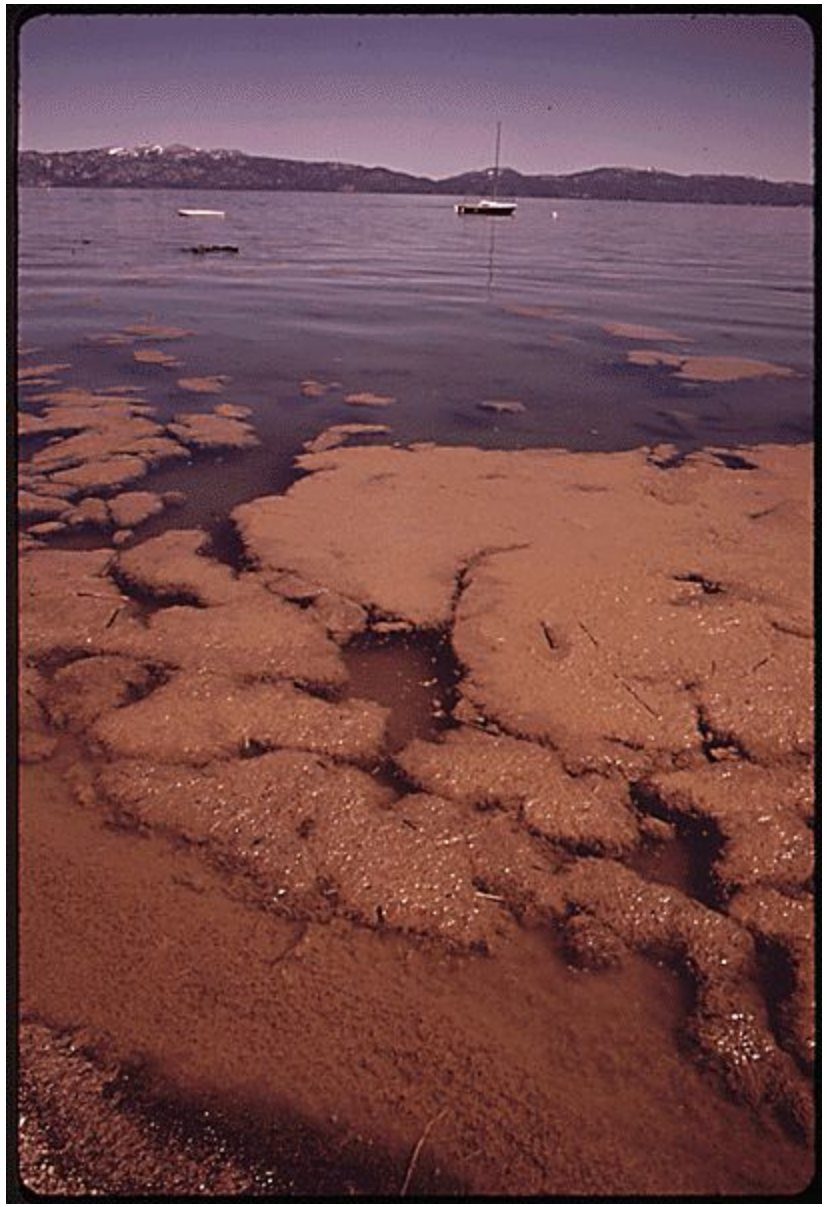
Smog

May 1972; photo by Gene Daniels

Aluminum plant smokestack

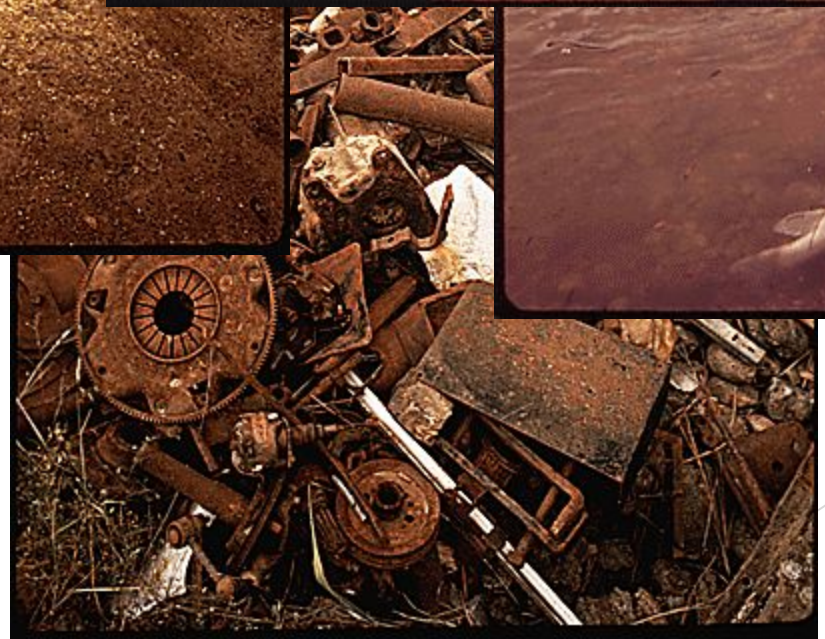


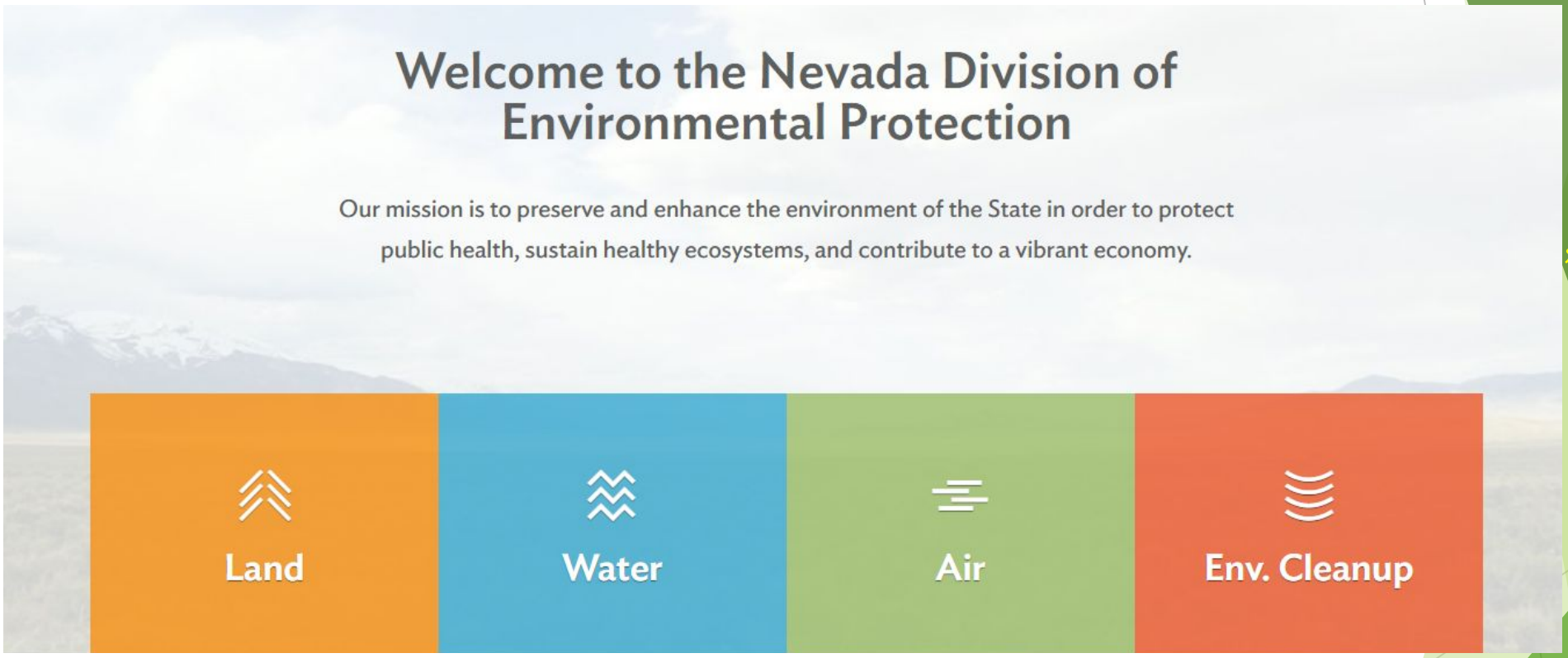
March 1973 ; photo by John Messina



Algae along shore near Lake Tahoe, Nevada

May 1972; photo by Belinda Rain




Welcome to the Nevada Division of Environmental Protection
Our mission is to preserve and enhance the environment of the State in order to protect public health, sustain healthy ecosystems, and contribute to a vibrant economy.
Land
Water
Air
Env. Cleanup

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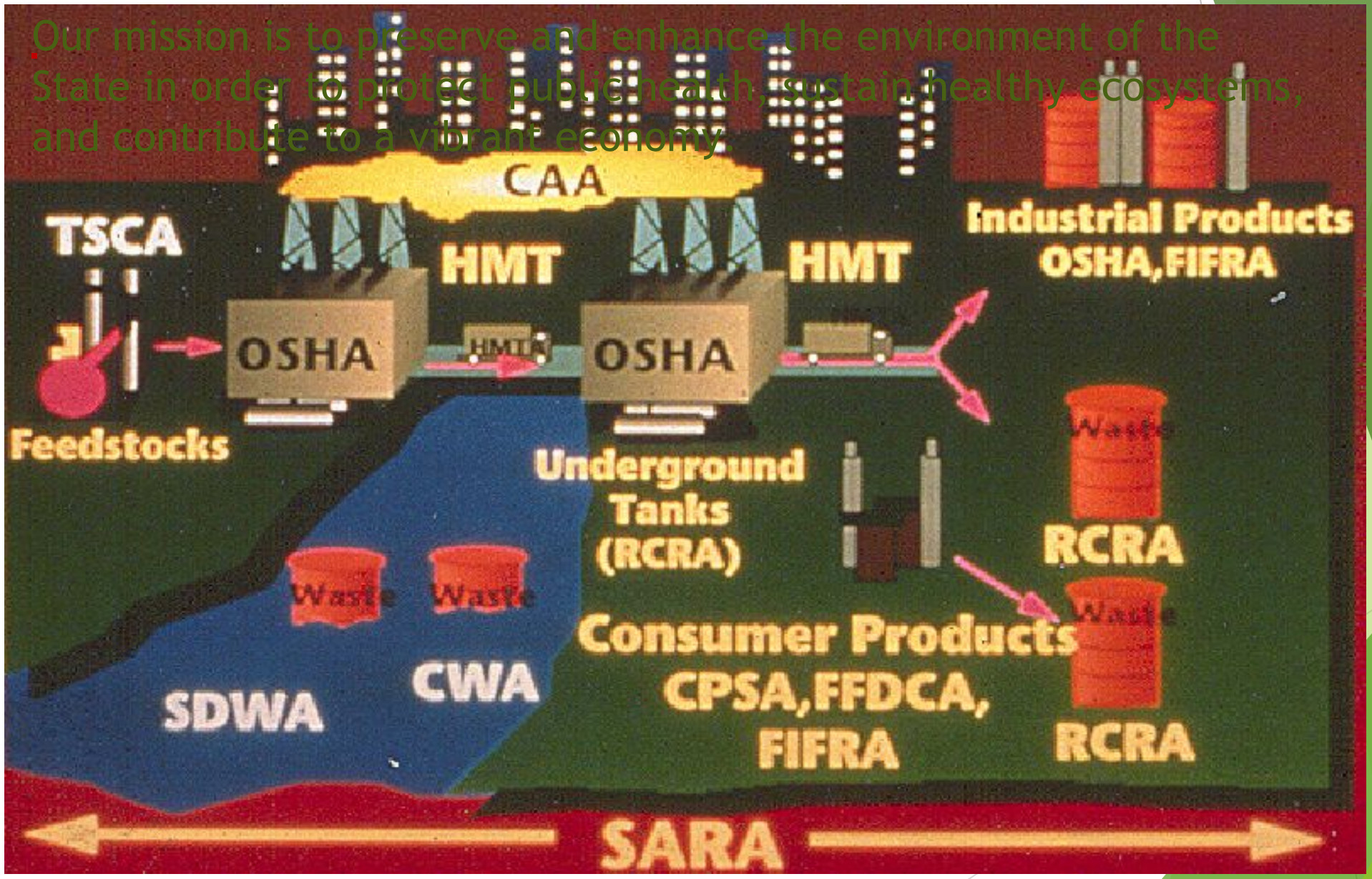


Environmental Regulations

- Confusing
- Voluminous
- Often not followed
  - Even with the best of intentions
  - The rules matter more than the results
- Interferes with Business

Common Regulatory Issues for Metal Manufacturing Sector

- Hazardous Waste (RCRA)
  - State and local authorities
  - Liability – you are responsible from cradle to grave
- Air emissions
  - Permit by rule or more depending on your area.
- Pretreatment Permits
  - Local authorities
- Clean-up
  - Company ending
- Changes in chemical use allowed
- Transportation
- Oil spills and leaks

EPA Compliance Guidance

Air

- Greenhouse Gas Reporting Program
- National Emission Standards for Hazardous Air Pollutants (NESHAP):
  - Benzene Waste Operations
  - Chromium Electroplating
  - Coke Ovens: Pushing, Quenching, & Battery Stacks
  - Coke Ovens (Charging, Top Side, and Door Leaks)
  - Degreasing Organic Cleaners (Halogenated Solvent Cleaners)
  - Electric Arc Furnace Steelmaking Facilities (Area Sources)
  - Ferromanganese and Silicomanganese Production (Ferroalloys, Major Sources)
  - Industrial Cooling Towers
  - Integrated Iron and Steel
  - Iron and Steel Foundries (Major Sources)
  - Lime Manufacturing
  - Metal Can (surface coating)
  - Metal Coil (surface coating)
  - Metal Furniture (surface coating)
  - Paper and Other Web (surface coating)

Water

- Iron and Steel Rulemaking Process: effluent guidelines.
- Metal Products and Machinery: effluent guidelines.
- Metal Molding and Casting (Foundries) Effluent Guidelines
- Nonferrous Metals Manufacturing Effluent Guidelines
- Metal Finishing Effluent Guidelines

Compliance

- Combustion Portal EXIT : compliance assistance center.
- Industrial Materials Recycling: Foundry Sand
- Metals Sector Compliance Assistance EXIT : including sector profiles and assistance centers.
- Mining and Mineral Processing Compliance Assistance Resources for the Gold and Copper Industrie

Related Technical Information

- AP 42 - Chapter 12: Metallurgical Industry - emission factors and process information for air pollution source categories.

https://www.epa.gov/regulatory-information-sector/metals-sector-primary-naics-331-and-fabricated-naics-332

- Certifications and Continuing Education credits
  - Environmental Regulatory Professional (ERP)
  - Master Certification (MC) for the Environmental Professional
  - Safety, Health and Environmental Professional (SHEP)
  - Specialist in Environmental Regulations (SER)

https://web-ded.uta.edu/wconnect/CourseStatus.awp?&Course=etihom

ENVIRONMENTAL TRAINING INSTITUTE
THE UNIVERSITY OF TEXAS ARLINGTON
ZERO WASTE NETWORK

Increasing Profits

“Every Waste is Hazardous; it is a hazard to the bottom line.”

George Freida,

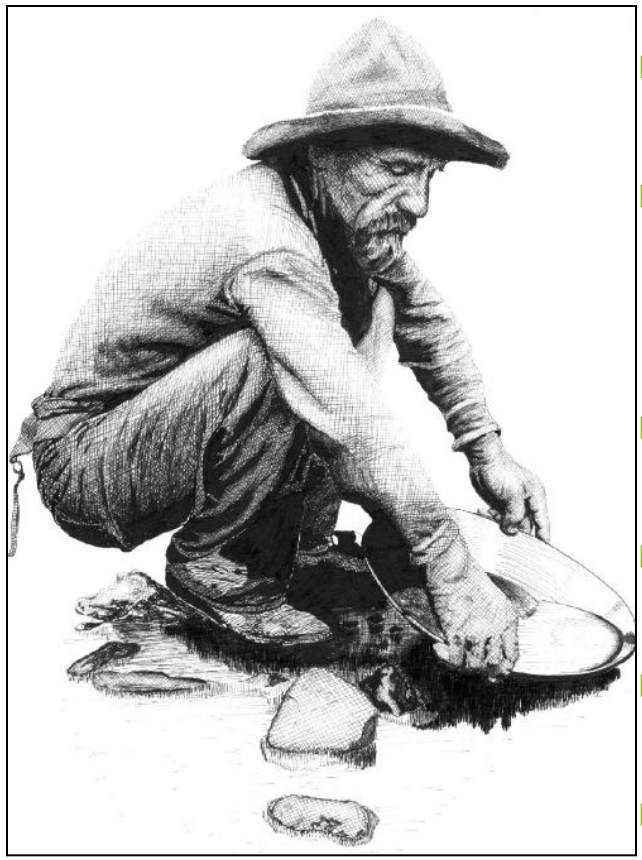
Quantum Chemicals

How much does “waste” really cost?

- It costs our company $200 to dispose of a 55-gallon drum of hazardous waste;
- Our solid waste disposal cost is just $60 a ton;
- Our wastewater disposal costs are only 10 cents per gallon; or
- The solvent in our parts cleaner is replaced every month for $50.

What other Costs?

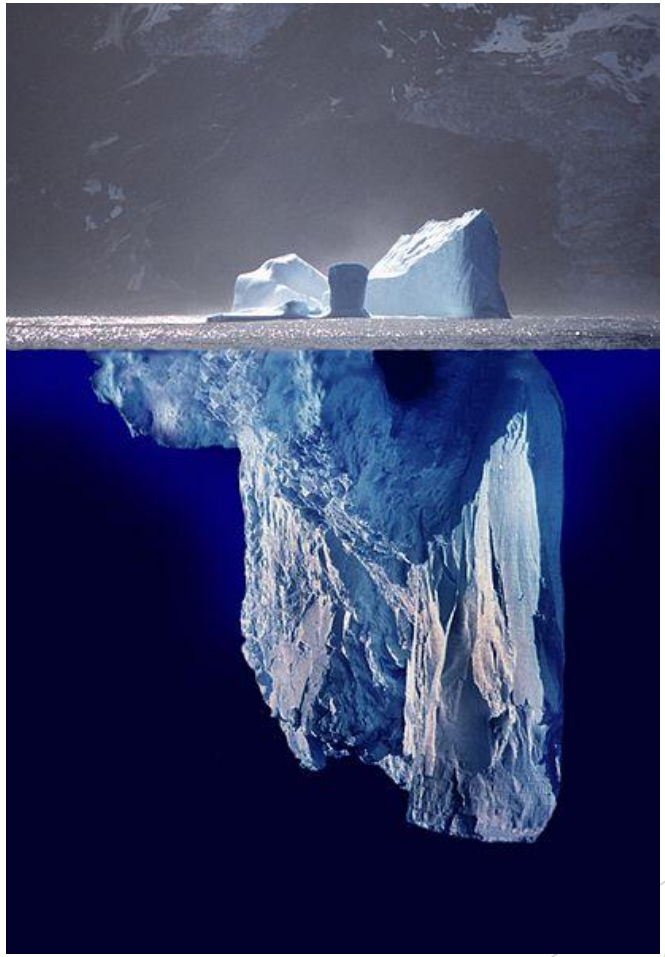
Hidden Costs



- Labor
- Personal protection equipment
- Workers' compensation
- Insurance
- Medical monitoring
- Training
- Reporting

Rule of (green) thumb

- Disposal costs are typically only about 15% of a waste's total costs.
- What about the other 85% ?
- Could hidden waste costs could be sinking your company's profit margins?

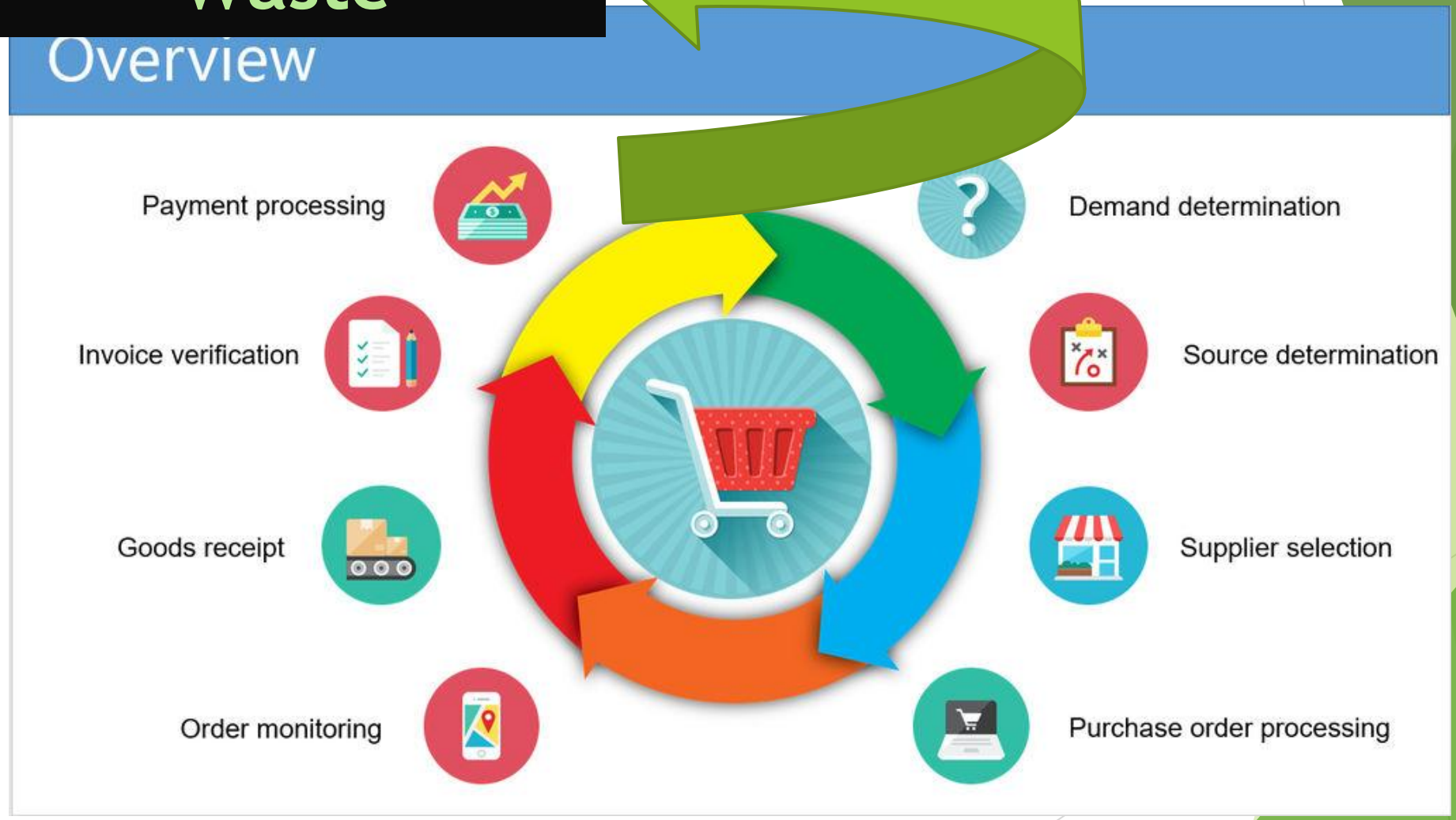


Some Hidden Operational Costs

- Storage space value
- Equipment cleaning
- Treatment
- Monitoring
- Paperwork
- Supply Chain Management

Supply Chain Management

Waste



Goodman®

Air Conditioning & Heating

- 800,000 lbs. Solid Waste
- 1200 tons CO2e
- $850,000 Saved

- **Saved $850,000 from Source Reduction**
- **Recycled 194,000 lbs of plastic film and saved $17,000 between cost avoidance and rebates**

Before

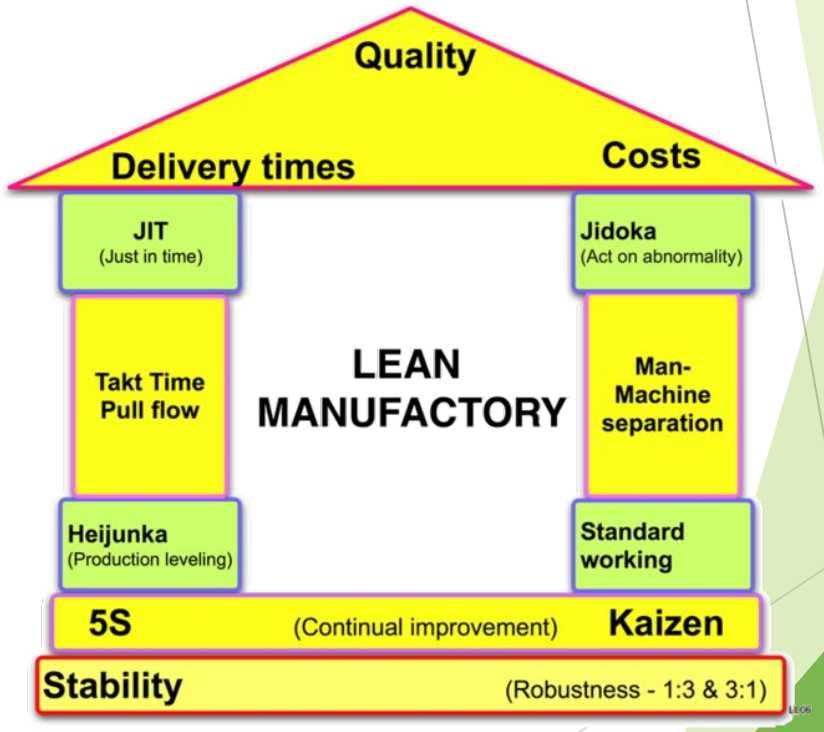
After

- **Consider**
  - **Transportation**
  - **Movement**

Lean: Quality at the Source

- **Lean: Every Step Leading to a Defect Adds to Costs.**

- Therefore, Any Wasted Material Costs Include:
  - Ordering
  - Storage
  - Handling
  - Disposal



Some Hidden Regulatory Costs

- ✔ Training
- ✔ Permit fees
- ✔ Consulting fees
- ✔ Potential fines and penalties for violations
- ✔ Remediation

Remediation – Company Ending

News Releases from Region 01

EPA recovers costs for cleanup work done at Fletcher's Paint Superfund Site, Milford, N.H.

02/15/2019

Contact Information:
John Senn (senn.john@epa.gov)
617-918-1019

- $3.2 Million for one site

Boston - The U.S. Environmental Protection Agency (EPA) today announced a cost recovery settlement with the General Electric Company (GE) for the cleanup of the Fletcher's Paint Works and Storage Facility Superfund Site in Milford, N.H.

GE was found liable for the cleanup and disposal of the PCB contamination at the Fletcher's Paint Superfund Site. As the Responsible Party, GE has agreed to pay $3.214 million to resolve all the outstanding site costs that the federal government incurred through the cleanup process.

Rules of Thumb

- Labor
  - ✔handling & regulatory
  - ✔4x disposal costs
- Liability
  - ✔remediation & penalties
  - ✔10x disposal costs
  - ✔Company ending

Economics of Waste Reduction

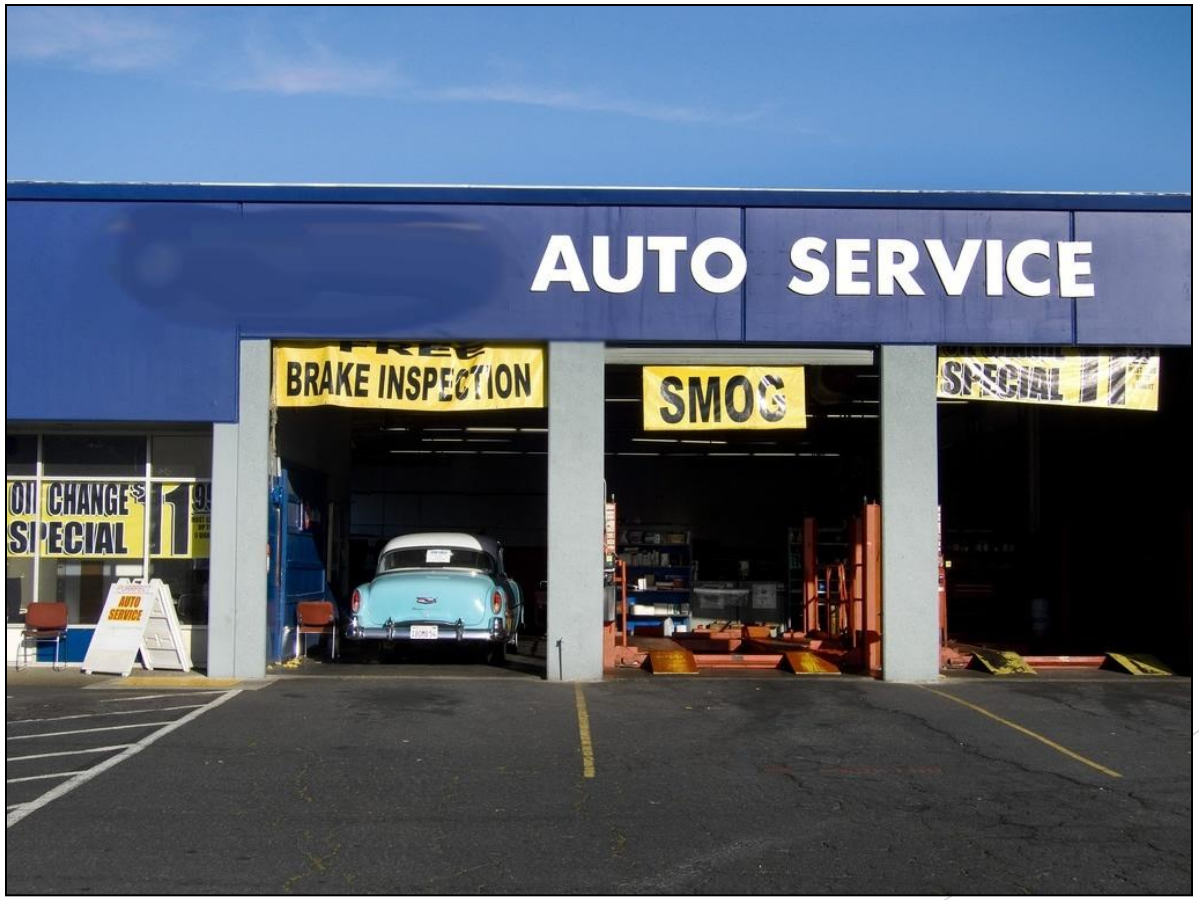
- Calculate the true cost of the waste
- Assign waste costs to business unit
- Estimate the benefits of a P2 project
- Calculate payback

How Much Detail?

- Cursory?
- Detailed?
- Full-cost accounting?

A: Enough to make a good business case.

A Tale of Two Service Bays



Basic Accounting

- Joe-Bob's Repair Bay
  - Hazardous solvent cost ($3.00/gal) X (1,500 gal/yr) = $4,500/yr
  - Disposal(4 drums/year) X $450/drum = $1,800/yr

Total costs $6,300/yr

- Fred's Repair Bay
  - Soap solvents($5.00/gal) X (300 gal/yr) = $1,500/yr
  - Disposal costs $500/yr

Total costs $2,000/yr

Financial Analysis

- Varies from company to company
- What is your payback period?
- Longer payback period if:
  - Environmental issues
  - Risk reduction

Full Cost Accounting

- Costs rather than outlays
- Hidden costs and externalities;
- Overhead and indirect costs;
- Past and future outlays;
- Costs according to lifecycle of the product

Costs vs. Outlay

- Outlay – A cost to access the material, product or service
- Costs – costs over a lifetime

- Example: A vehicle purchase is an outlay, but total cost is accrued over the lifetime.

Success Story: Overcoming Outlay Costs

CDC Coatings/Dickson Weatherproof Nail Co.

- Oil Recovery
- Reconditioned Lube Oil
- 1 Micron Filter
- Reusable Absorbent

Equipment Costs: $2,000
Wasted Lube Oil: $10,000

Weatherproof Nail (cont'd)

Filter & Reuse Lube Oil

- *$0/gallon disposal*
- *$5/gallon raw material costs*
- *$2,000 - filtration unit outlay*

Usage/year	Savings/year	Payback
500 gal	$ 2,500	10 months
2,500 gal	$12,500	2 months

Woodfold Manufacturing

Reductions	Source of Savings	Annual Cost Savings	Annual Time, Material, & Environmental Savings
Labor/Increased Capacity	New filter system	$3,800	Over 160 hours
Material	Avoided paint purchase (raw material) due to new paint container design	$1,440	48 gallons/year
Improved transfer efficiency		$34,664	136.3 gallons primer 854.1 gallons of lacquer
Emissions	Improved transfer efficiency	Not quantified	968 pounds VOCs 82 pounds hazardous air pollutants (HAPS)
Disposal	Booth Filters (longer life)	$954	50% reduction in filter material used
PVC scrap to recycler		$670	6 tons scrap PVC
Water	New flush /purge water methods	$4	2,600 gallons/year
Energy	Reduced use of evaporators due to improved water use	$3,300	120,000 kwh electricity
Total Cost Savings (Quantified as of 8/08)		$44,832	

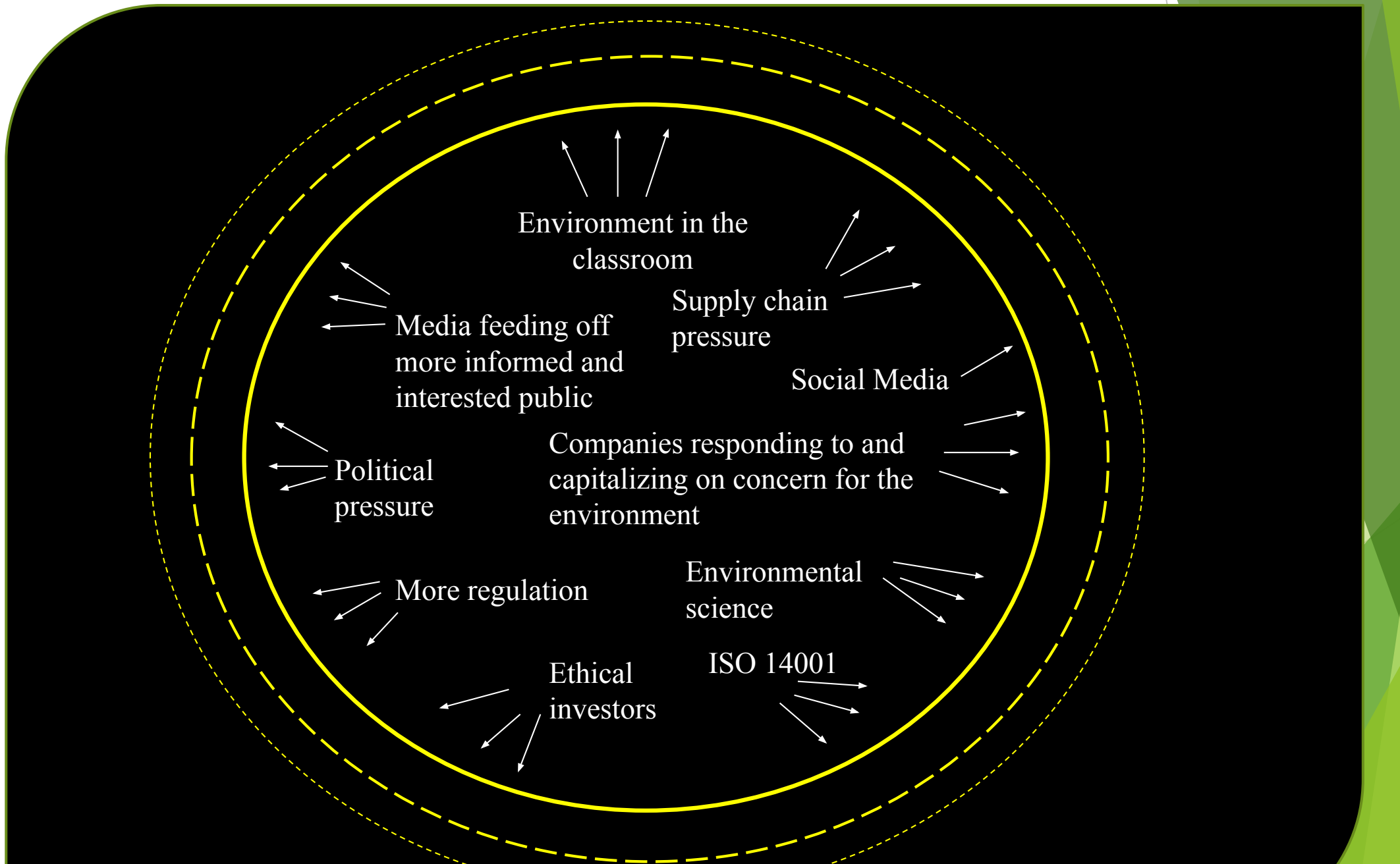
Table 2. Annual Cost, Time, Material, and Environmental Savings for Implemented Changes

Managing Risks

Risk Management

- The 2015 Revisions to ISO standards encouraged risk based thinking. This demonstrates the power of risk management as a business tool

Forces Driving Interest in Environment



Environmental Education

- **Awareness and sensitivity** to the environment and environmental challenges
- **Knowledge and understanding** of the environment and environmental challenges
- **Attitudes** of concern for the environment and motivation to improve or maintain environmental quality
- **Skills** to identify and help resolve environmental challenges
- **Participation** in activities that lead to the resolution of environmental challenges

Source: EPA Education Program:
components of environmental education

Supply Chain

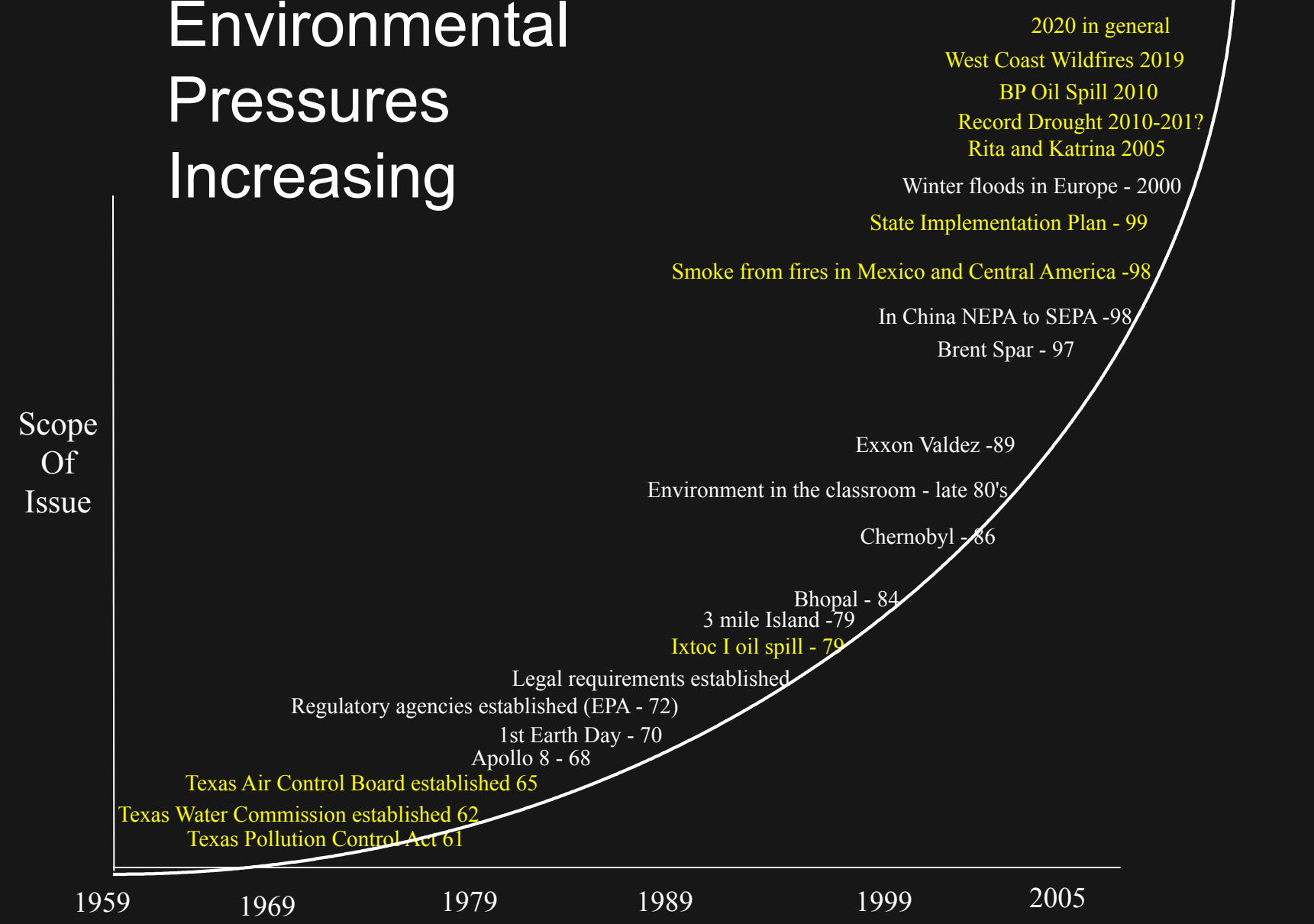
Original Equipment Manufacturers often require their suppliers to be certified under ISO 14001.

Lack of awareness by a supplier can cause critical problems that aren't recognized until it is too late.

Sony's Christmas Surprise!

- 1.3 million PlayStation®2's Blocked from European Market
- Cadmium
  - 0.01% of the Supply Chain
  - Required audit of 3000 factories
  - $130 million Replacement Costs
- Other Losses
  - Market Share
  - Public Perception

Environmental Pressures Increasing



What is the big environmental issue this year?

Disaster Management

- Plant Shut Down Strategy
- Storage areas
- Types and impact of toxic chemicals
- Sewage and wastewater treatment

Public Attitudes on the Environment

- NIMBY – “Not in my backyard”
- NOTE – “Not over there either”
- BANANA – “Build Absolutely Nothing Anywhere Near Anything”
- CAVE – “Citizens Against Virtually Everything”
- NOPE – “Not On Planet Earth”

Public Perception

- What does your site look like from the fenceline

Homeland Security

https://www.dhs.gov/cisa/chemical-security

Chemical Facility Anti-Terrorism Standards

CFATS is a DHS regulatory program focused on security at high-risk chemical facilities to ensure they have security measures in place to reduce the risks associated with certain hazardous chemicals.

Ammonium Nitrate Security Program

The ANSP is a proposed regulatory program that seeks to reduce the likelihood of a terrorist attack involving the misuse of ammonium nitrate by creating a registration program for purchasers and sellers.

Chemical Sector Security Events

CISA sponsors events throughout the year to engage with stakeholders, exchange security-related information, and share best practices about chemical security.

Chemical Sector Resources

The Chemical Sector-Specific Agency provides institutional knowledge and specialized expertise to collaboratively develop, coordinate, and implement voluntary programs to

Security and Environment

Water Treatment: Chlorine Gas

- ✔ Acutely toxic for 20 miles
- ✔ Travels 2 miles in 10 minutes
- ✔ Switch to sodium hypochlorite

Islamic State 'using chlorine gas' in roadside bombs

Iraqi officials have shown the BBC videos that they say confirm Islamic State militants are using chlorine gas in some crude home-made bombs.

Chemical weapons experts believe that the use of chlorine is intended to have a psychological impact on Iraqi soldiers and civilians.

The BBC's Ahmed Maher reports from Baghdad.

12 Mar 2015

Share

Next course:

- Real World Examples
- How to find your solution
  - Process Mapping
  - Lean
  - Management Systems