TOXICS REDUCTION PROGRAM

2022 Annual Report

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DEPARTMENT OF ECOLOGY
State of Washington

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INTRODUCTION

After more than two years navigating through historic societal and economic changes, we continue to adapt and find ways to support business and industry as they minimize and eliminate toxic chemical and dangerous waste impact.

2022 marked another successful year in which our technical assistance providers collaborated with Washington businesses. We helped identify and implement pollution prevention (P2) opportunities that resulted in positive, concrete benefits that led to:

- Reduced dangerous waste and toxic chemical use.
- Improved worker and consumer safety.

In addition to the environmental and health benefits generated by P2 practices, businesses saved significant costs by adopting more efficient processes, reducing liability, and taking advantage of our pollution prevention grant funding.

In this report, we highlight some of the program's accomplishments from 2022, including:

- **Pollution Prevention Plans**—we engaged with more than 500 businesses to help them develop and submit their P2 plans.
- **Technical assistance**—we provided direct, non-enforcement support to businesses at no cost, reducing:
  - » Annual costs
  - » Toxic chemical use
  - » Hazardous waste generated
  - » Toxic chemical emissions released
  - » Water and energy use
  - » Solid waste generated
- **Pollution Prevention grants**—we received federal grant funding to work on several new projects with partnering organizations and agencies. We also achieved significant milestones on our 2018 and 2020 P2 Grant award projects.
- **Environmental Justice initiative**—we examined our work in or adjacent to overburdened communities by using data and tools, and incorporated an emphasis on advancing environmental justice for our 2022 P2 grant projects.

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OUR **IMPACT**

Our team helps businesses develop and submit P2 plans that meet regulatory requirements (WAC 173-307[1]). These plans are intended to achieve the greatest reduction of toxic chemical use and dangerous waste generation at a facility in economical and technically feasible ways.

In 2022,[2] businesses that prepared P2 plans reported saving approximately **$6 million** in costs thanks to P2 solutions such as:

- Reducing toxic chemical use
- Reducing hazardous waste generation
- Recycling
- Improving operational efficiency
- Reducing water and energy use
- Reducing air emissions releases
- Upgrading equipment

Technical assistance

This past year, we:

- Engaged with **511 businesses**
- Visited **151 facilities**
- Identified P2 opportunities during **49 visits**
- Implemented P2 projects during **6 visits**

Our P2 projects, including P2 Grant projects, led to Washington businesses reducing:


$421,805 in annual costs


144,170 pounds of toxic chemicals used


162,848 pounds of hazardous waste generated


319.96 metric tons of CO2 emitted


17,500 gallons of water used per year


43,200 pounds of solid waste


360,993 kilowatts of electricity

1 https://app.leg.wa.gov/WAC/default.aspx?cite=173-307
2 Numbers reflect reductions and savings achieved in 2021 that were reported by Washington state businesses in 2022.

Technical assistance site visits

Figure 1 shows the number of businesses that prepared P2 plans by county and our technical assistance visits in 2022 by city.

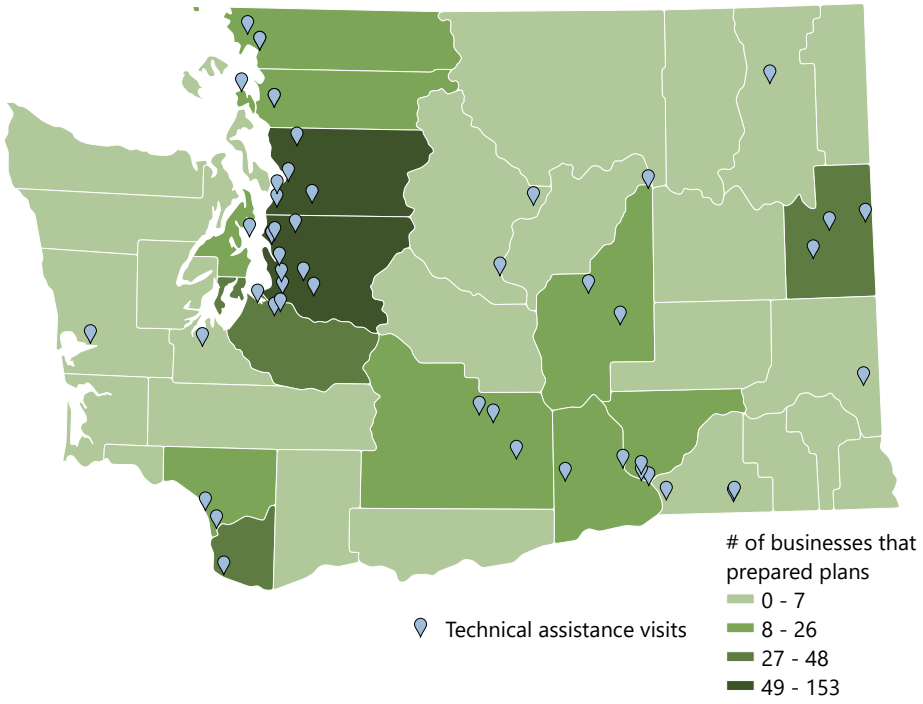

Figure 1. Map of Washington state showing P2 plans prepared by county and technical assistance visits by city completed in 2022.

Environmental health disparities

In 2021, the Legislature passed the Healthy Environment for All Act (HEAL Act)—the first statewide law to create a coordinated and collaborative approach to environmental justice. This is a historic step towards eliminating environmental and health disparities in communities of color and low-income populations.

As one of the seven state agencies covered by the HEAL Act, Ecology is required to meet standards of practice to demonstrate advancement in this area, such as using cumulative environmental health impact data in our decision making.

We created Figure 2 by using data the Washington State Department of Health compiled to compare communities across the state for environmental health disparities.[3] They used various indicators divided into four themes:

- **Environmental Exposures**: Diesel emissions, ozone concentration, proximity to heavy traffic roadways, and toxic releases from facilities.

3 https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map

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- **Environmental Effects**: Lead risk from housing and proximity to hazardous waste treatment, storage, and disposal facilities, Superfund sites, Risk Management Plan facilities, and wastewater discharge.
- **Sensitive Populations**: Death from cardiovascular disease and low birth weight.
- **Socioeconomic Factors**: Limited English proficiency, no high school diploma, poverty, people of color, transportation expense, unaffordable housing, and unemployed.

These indicators are threat and vulnerability factors that create a cumulative risk defined as an environmental health disparities (EHD) score. The EHD score represents communities experiencing a disproportionate share of environmental health burdens that will need assistance to reach equitable outcomes, with a higher score indicating higher risk.

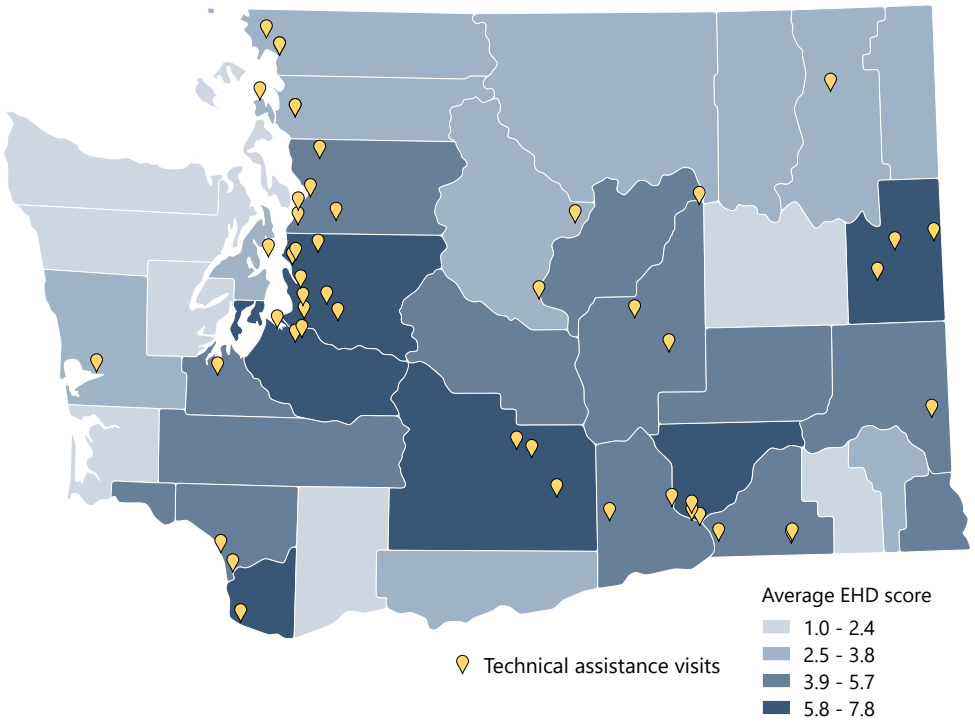


Figure 2: Map of Washington state showing average EHD score by county and technical assistance visits by city completed in 2022.

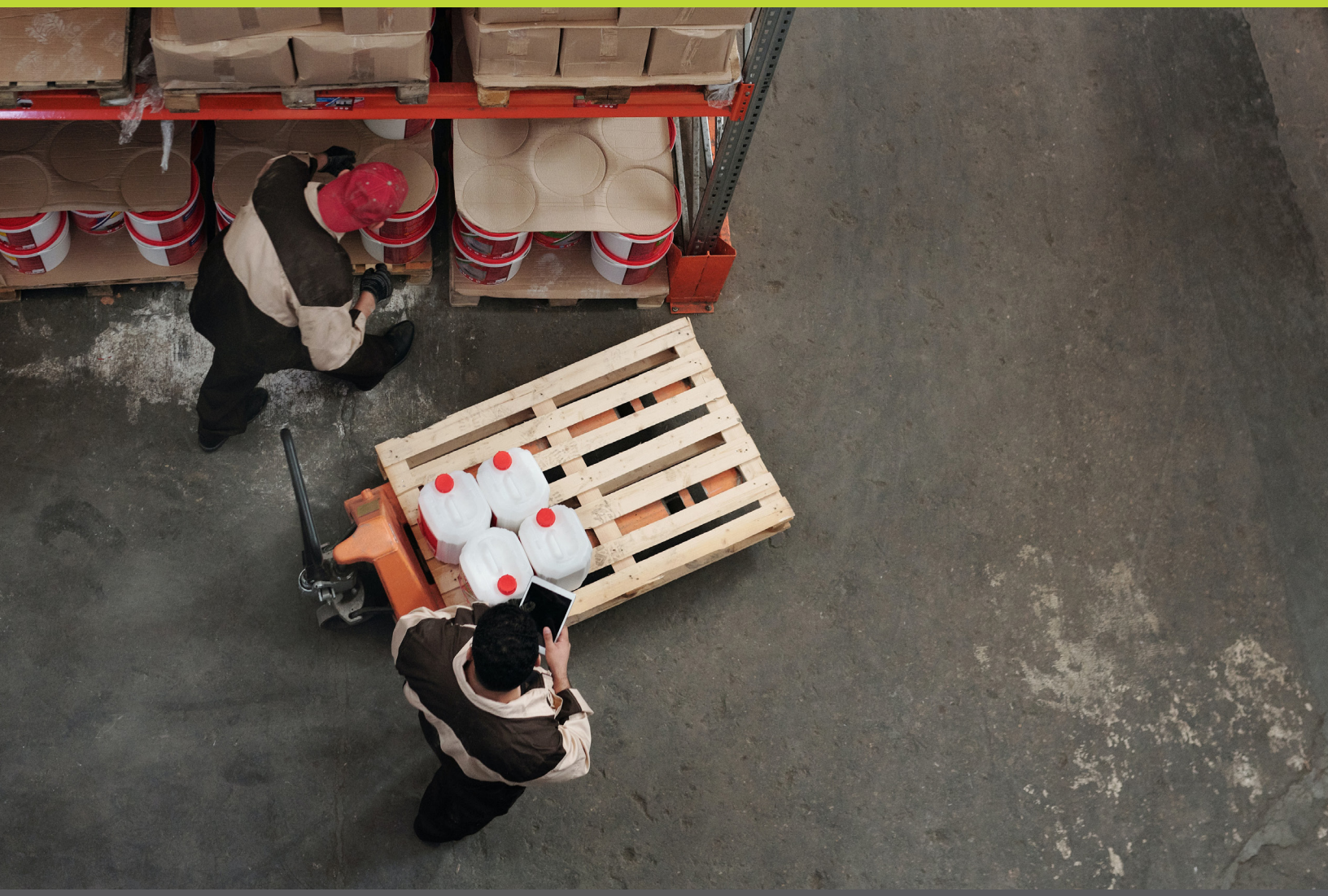
Figure 2 shows the average EHD score by county and our technical assistance visits in 2022 by city.[4] We use this map to guide and support our planning process, to help us prioritize our technical assistance visits to facilities that prepare P2 plans and generate hazardous waste.

4 This map summarizes EHD scores by county using data collected on the census track level and therefore does not illustrate the high degree of variance within a city.

POLLUTION PREVENTION **GRANT**

In 2022, the U.S. Environmental Protection Agency (EPA) awarded Ecology with a P2 grant to fund two-year projects that provide businesses with technical assistance to reduce or eliminate pollutants at the source, before they're created.

This funding opportunity allows us to engage in partnerships to help develop, adopt, and share pollution prevention solutions at businesses across the state. Under this grant, we'll place more emphasis on technical assistance projects that benefit communities located in areas with high EHD scores and build off the success of projects funded under the 2018 and 2020 P2 grant awards.



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2022 P2 GRANT SUCCESS STORIES

Green chemistry & safer alternatives assistance

The P2 grant helps facilitate partnerships between Ecology, universities, and organizations to meet the shared goal of promoting green chemistry and adopting safer alternatives in the chemical manufacturing industry.

Green chemistry is designing chemical products and processes to reduce or eliminate toxic chemical use and hazardous waste generation; it's a discipline that applies to all areas of chemistry.

In 2022, P2 grant funds helped increase collaboration and promote information sharing with companies, technical assistance staff, educators, and a network of strategic partners at six trainings and workshops. We leveraged partnerships with organizations such as the Toxics Use Reduction Institute[5] to create resources and a workshop to help businesses understand the hazards of halogenated solvents, and learn how to find safer alternatives to hazards in the workplace. You can find some of these resources on Ecology's safer alternatives to toxic chemicals webpage.[6]

The P2 grant also allows us to work with educational organizations in Washington—such as the North Central Education Service District[7] and the Washington Office of Superintendent to Public Instruction[8]—to develop and disseminate open access green chemistry lessons and courses, and connect teachers to national green chemistry organizations such as Beyond Benign.[9] These resources empower and prepare educators, students, and the future workforce to practice pollution prevention at the molecular level.

5 https://www.turi.org/
6 https://ecology.wa.gov/SaferAlternatives
7 https://www.ncesd.org/
8 https://www.k12.wa.us/
9 https://www.beyondbenign.org/

Automotive degreaser replacement program

Automotive shops use solvent-based degreasers that contain Hazardous Air Pollutants (HAPs), halogenated solvents, or carcinogens. These hazardous chemicals like methylene chloride, toluene, methanol, and others have short- and long-term health effects. Regular use and accidental spills of these hazardous products are also bad for the environment and require careful management and expensive disposal.

The P2 Grant allowed Ecology to kick off an automotive degreaser replacement program. This program allows auto shops to qualify for up to $10,000 in reimbursement costs for switching to safer alternatives, like EPA's Safer Choice products. So far, we've:

- Received 284 applications
- Visited 118 auto shops
- Issued a total of $346,208.64 to 65 auto shops

The program is on track to continue with primary support from our Product Replacement Program[10] and Pollution Prevention Assistance[11] partnership.

10 https://ecology.wa.gov/AutoDegreasers
11 https://ecology.wa.gov/PPA

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Pollution Prevention in the Food and Beverage Industry

In 2020, the food and beverage manufacturing and processing industry accounted for about 5% of reported releases of toxic chemicals to the environment. This industry covers a range of industrial processes that lend themselves to a variety of pollution prevention solutions.

One area we focused on was cleaning processes, which require a large volume of water and use various types of chemicals. They are also very energy and labor intensive. We worked with JM Smucker—a fruits processing company in Yakima County—to design a clean-in-place system for their facility.

Clean-In-Place (CIP) systems are automated to clean pipes, processing vessels, tanks, spiral freezers, mixers, blenders, homogenizers, roasters, and associated fittings—without disassembling the process. This maximizes production time and minimizes other activities and costs associated with the cleaning process. Check out this video[12] to learn more about our collaborative partnership with JM Smucker.

We determined the CIP system would:

- Save $7,700 in annual costs due to improved operational efficiency
- Reduce 20,000 pounds of toxic chemicals per year
- Save 2,500 gallons of water per day

We also provided technical assistance to six different food and beverage facilities across the state to identify improvement opportunities to existing refrigeration systems and wastewater treatment processes.

Our recommendations resulted in:

- $46,000 in annual cost savings due to improved operational efficiency
- 120,000 pounds of reduced toxic chemical use per year
- 15,000 gallons of water saved per day
- 50% decrease in refrigerant leaks

12 https://www.youtube.com/watch?v=Ct2xj4NTEy0

Energy efficiency audits

We partnered with a consulting firm to conduct energy efficiency audits at two facilities in the food and beverage industry. The energy audits at both sites identified activities that would:

- Save $84,600 in costs
- Reduce 293 metric tons of CO2 emitted

These activities range from changing refrigeration control settings to upgrading the warehouse lighting infrastructure.

Our partners in the energy efficiency industry focus on tackling energy waste in the most energy-intensive sectors of our economy. Their research and technical assistance in the food and beverage industry identified a variety of low-cost changes to operational systems in areas like refrigeration, lighting, compressed air, and ventilation. Other energy efficiency opportunities resulted in capital savings that would achieve significant reductions over time, such as installing new equipment.

Our P2 grant funds allowed us to learn from these experts and build an energy savings culture to create lasting change.

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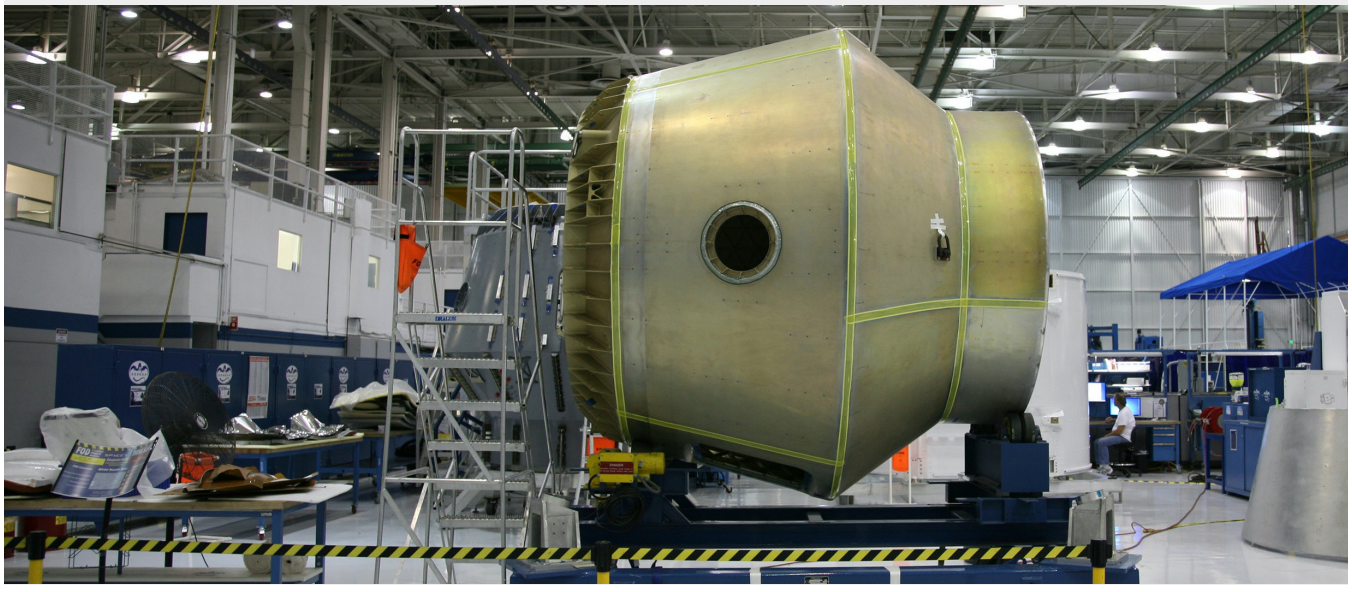
Washington Applied Sustainability Internship

The Washington Applied Sustainability Internship (WASI) program is a collaboration between the Washington Sea Grant program and Ecology to help businesses and industry prevent pollution and produce measurable environmental improvements. During last year's 10-week paid summer internship program, two college interns worked with Washington businesses to research safer fire suppression foam alternatives in the aerospace industry and implement a recycling program at one of the nation's leading hospitals.

The WASI interns provided recommendations that resulted in the following successes.

Aerospace Industry

- An assessment of aqueous film forming foam (AFFF) firefighting alternatives that meet production requirements while complying with state, local, and building requirements.
- An implementation plan to remove and install PFAS-free foam.
- A cost benefit analysis for switching out current foam with PFAS-free foam, projecting reductions of:
  - $50,000 in annual costs
  - 4,170 pounds of toxic chemical use
  - 100,080 pounds of hazardous waste generated



Medical Industry

- Established a recycling program for sterile polypropylene blue wrap waste from operating rooms, including logistics for collection, storage, transport, and management.
- A communication plan and educational material for rollout of the program.
- An investigation into future recycling contracts that include vendor responsibilities and product stewardship.
- Recycling 19,200 pounds of blue wrap that resulted in reducing:
  - » $3,769 in annual costs
  - » 19,200 pounds of solid waste
  - » 44 cubic yards of landfill space
  - » 7.95 metric tons of CO2
  - » 126,448 kilowatts of electricity
- The following projected reductions by replacing blue wrap with rigid sterilization containers:
  - » $24,000 in annual cost savings
  - » 24,000 pounds of solid waste
  - » 55 cubic yards of landfill space
  - » 19.01 metric tons of CO2
  - » 234,545 kilowatts of electricity

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Lean and Green

Our continued partnerships with Impact Washington and Lean Environment Inc. has led to significant pollution prevention achievements at Romac Industries Inc., a steel fittings manufacturing facility in Bothell.

During phase 1, we provided training on lean and green principles to help Romac decrease waste generation, maintain product consistency, and increase worker safety. This service helped launch an ambitious project to re-engineer their existing stainless-steel ammonium bifluoride passivation process.

In 2021, Romac began phase 2, which resulted in the following 2022 reductions:

- 54,472 pounds of dangerous waste generated from the passivation room
- $25,000 in costs

We estimate that after the project is complete, results will include:

- 98% reduction in dangerous waste generation
- 200% increase in line capacity
- $100,000 in annual cost savings
- 50% reduction in labor costs
- Improved safety for line operators
- Significant reduction in energy use

These real-world achievements earned Romac a Multimedia Award[13] from the National Pollution Prevention Roundtable and set an excellent example for other businesses around the country in the metal fabrication sector.

13 https://www.p2.org/2022-MVP2-Awards

QUESTIONS? CONTACT US!

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