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Pollution Prevention Opportunity Assessment for Facilities Maintenance Team (FMT) Paint Shop

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Prepared by
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Abstract

This Pollution Prevention Opportunity Assessment (PPOA) was conducted for Sandia National Laboratories/California Facilities Maintenance Team Paint Shop Operations in August and September 2002. The primary purpose of this PPOA is to provide recommendations to assist Paint Shop personnel in reducing the generation of waste and improving the efficiency of their processes. This report contains a summary of the information collected and analyses performed and recommends options for implementation. The Sandia National Laboratories Pollution Prevention staff will continue to work with the Paint Shop to implement the recommendations.

Acknowledgements

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Executive Summary

The Facilities Modification Team (FMT) Paint Shop provides Sandia National Laboratories/ California (SNL/CA) with maintenance and special project support for all types of painting activities. Paint Shop personnel are concerned about waste they generate and have implemented numerous waste reduction measures. However, even with this reduction, the Paint Shop remains one of the largest generators of hazardous waste at SNL/CA. This Pollution Prevention Opportunity Assessment (PPOA) was conducted to provide recommendations for possible waste reduction measures primarily for hazardous and California-regulated waste streams. The PPOA team consisted of personnel from Environmental Compliance, Waste Management, Pollution Prevention (P2) and FMT. This interdisciplinary team was responsible for evaluating processes and waste streams and generating the P2 opportunities identified in this report.

The largest waste streams generated from the Paint Shop include solvents, paints, and materials contaminated with paint and solvents such as empty cans, paint stir sticks, and rags. The PPOA team evaluated waste stream data and potential waste reduction ideas for feasibility, applicability, and return on investment. Based upon this evaluation, five opportunities were selected for more in depth cost-benefit analysis. When implemented, these opportunities will reduce the generation of hazardous waste, reduce regulatory liability and reporting requirements, reduce personnel exposure to hazardous materials, improve operating efficiency, and provide a reasonable payback period on the initial investment in new equipment.

Opportunity 1: Solvent Distillation Unit/Paint Gun Washer

Opportunity 2: Parts Wash Rack

Opportunity 3: Specification Modifications

Opportunity 4: Work Control Changes

Opportunity 5: Reduction or Elimination of Latex Paint Discharges to the Sump

Acronyms and Abbreviations

BAAQMD	Bay Area Air Quality Management District
FMT	Facilities Modification Team
FY	Fiscal Year
IDT	Interdisciplinary Team
P2	Pollution Prevention
PPE	Personal Protective Equipment
PPOA	Pollution Prevention Opportunity Assessment
ROI	Return on Investment
SNL/CA	Sandia National Laboratories/California
SNL/NM	Sandia National Laboratories/New Mexico
VOC	Volatile organic compound

1.0 Introduction

The Pollution Prevention (P2) staff of Sandia National Laboratories/New Mexico (SNL/NM) conducts pollution prevention opportunity assessments (PPOAs) for Sandia organizations. The goal of a PPOA is to identify practical, cost-effective strategies to do one or more of the following:

- Reduce overall resource use
- Reduce or eliminate the generation of waste
- Reduce waste volumes and toxicity
- Increase purchasing of environmentally preferable material
- Reduce energy and water consumption
- Reduce the line organization's operational costs
- Reduce regulatory liability
- Reduce personnel exposure to hazardous material

The completed PPOA is presented to the organization for implementation. The P2 staff will assist with implementation as much as possible through technical and administrative support and identifying funding options when necessary.

This PPOA was conducted for the Facilities Modification Team (FMT) Paint Shop at Sandia National Laboratories/California (SNL/CA) in August and September of 2002. A preliminary assessment (*Initial Data Gathering and Opportunity Identification [Tasks 1 and 2*], SAND-2002-8476) of all waste generators at SNL/CA determined that Paint Shop operations generate a significant amount of hazardous waste. A second PPOA has been completed on Organization 8513, Maintenance Engineering, which is the parent organization to FMT.

The primary purpose of this PPOA is to identify and recommend strategies and technologies to eliminate or reduce the hazardous waste streams generated by Paint Shop operations. For the purposes of this report, the term "hazardous waste" refers to both waste defined as hazardous by the Resource Conservation and Recovery Act as well as the State of California Environment Department.

The process used to perform this PPOA is outlined in Figure 1. This report contains a summary of the information collected, the analyses performed, and recommended options for implementation. P2 staff members from both SNL/NM and SNL/CA will work closely with the Paint Shop to implement these options.

The PPOA team consisted of staff members from P2, the Paint Shop, Facilities Planning and Engineering (Organization 8512), and Environmental Operations (Organization 8516). This interdisciplinary team was responsible for evaluating processes and waste streams and generating the P2 opportunities identified in this report. Information was collected through interviews with facility personnel, site visits, evaluation of waste disposal and purchasing databases, and data collected to meet air emissions permit requirements.

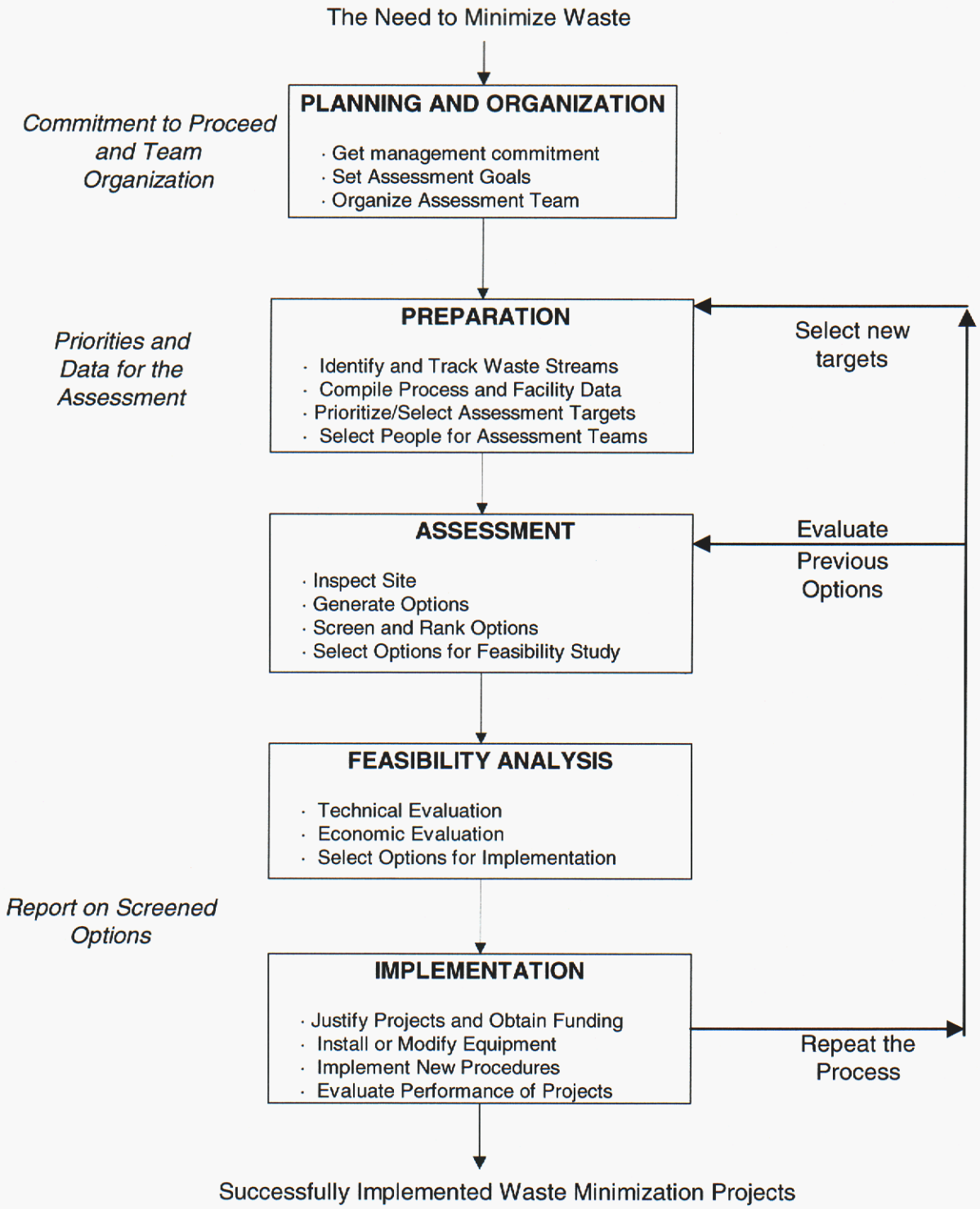

Figure 1. PPOA Process Diagram.

Alternatives identified through discussion and brainstorming with key personnel were then screened based upon feasibility and practicality. Finally, a cost-benefit analysis was performed on the selected alternatives to determine the costs and return on investment (ROI) for implementation.

2.0 Facility Description

Sandia established its California site in 1956 to support weapons engineering with its across-the-street neighbor Lawrence Livermore National Laboratory. SNL/CA employs slightly more than 1,000 persons, and its facilities consist of 60 buildings on 413 acres. The current fiscal year (FY) budget for SNL/CA is more than $152 million.

Work performed at SNL/CA focuses on manufacturing-related research including microelectronics, nano-technologies, combustion research, materials synthesis and processing, materials characterization, process simulation, engineering theory and design, prototype fabrication, and demonstration techniques. Applications include welding technologies, semiconductor fabrication, sensors, high-performance metals, ultra-hard ceramic coatings, and computational modeling and analysis.

The Paint Shop is part of the FMT (Organization 8513-1), which is under the Maintenance Engineering Department (Organization 8513). FMT provides maintenance services to existing SNL/CA structures and grounds. The Paint Shop is located in Building 963 and has the following capabilities:

- A permitted spray booth for spray painting all types of metal and wooden objects
- Brush and roller painting of existing buildings and structures
- Painting striping on site roadways and parking areas
- Sign painting
- Research and development testing and painting of parts for various weapons programs

The Paint Shop staff consists of three full-time employees. Figure 2 presents the Paint Shop layout.

3.0 Assessment Methodology

This PPOA is the first in a series of assessments to be performed at SNL/CA. A preliminary assessment (*Initial Data Gathering and Opportunity Identification [Task 1 and 2]* SAND2002-8476) ranked various SNL/CA organizations according to potential waste reduction opportunities. Criteria included high waste-generation rates, high probability for success, ease of implementation and potential for "green" purchasing, and energy reduction. The Paint Shop was targeted for further assessment based upon the quantities of waste generated and the likelihood that P2 opportunities could be easily implemented. A second PPOA is in process on other operations in the Maintenance Engineering Department (Organization 8513).

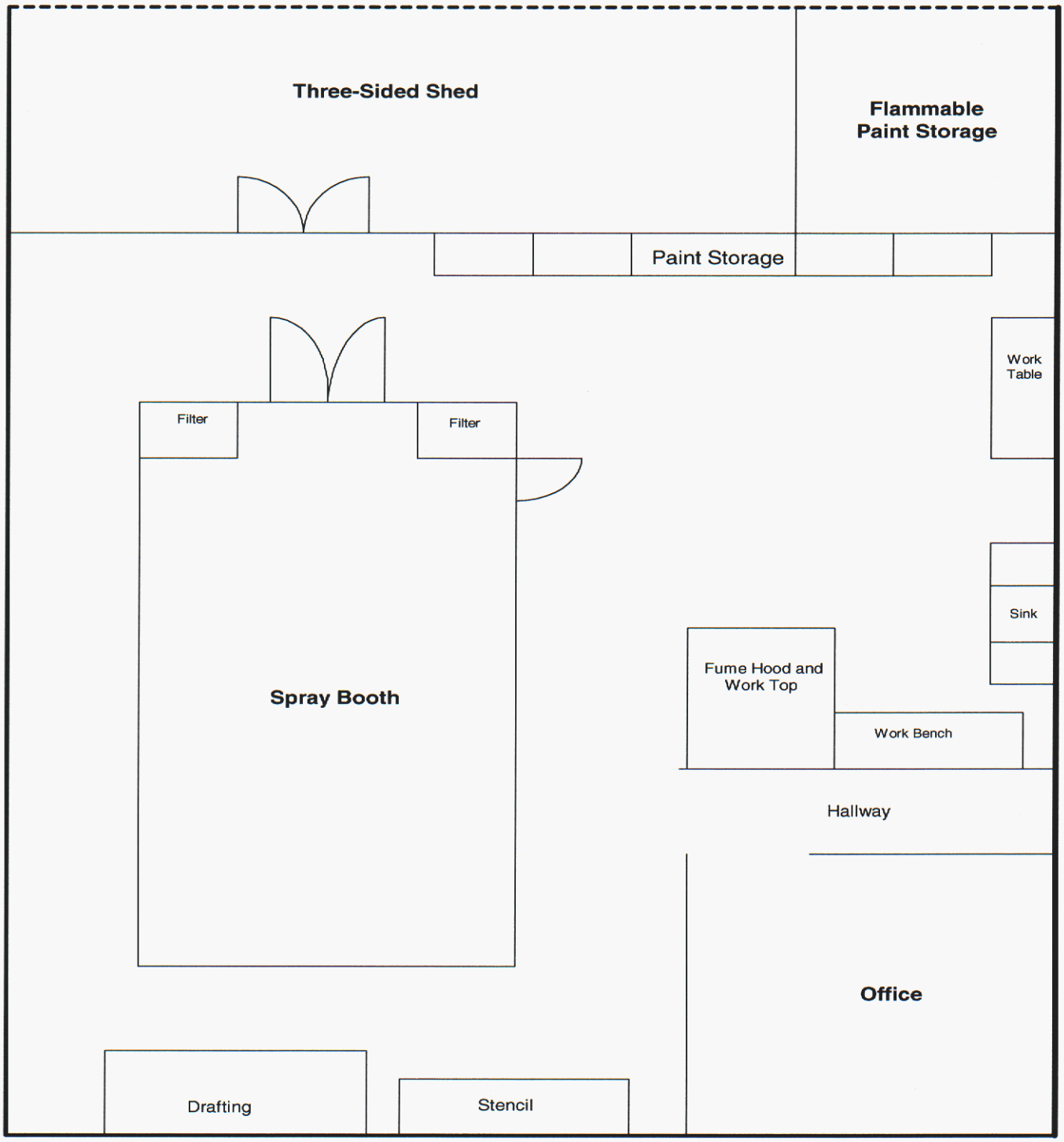

Figure 2. Paint Shop Layout.

As depicted in Figure 1, the major steps of a PPOA include planning, preparation, assessment, feasibility analysis, and implementation. For this PPOA, the planning and preparation portion involved reviewing information from the initial assessment and identifying major waste streams generated by Paint Shop operations. Waste data for FY 2000 and 2001 and the first two quarters of FY 2002 were evaluated.

The assessment phase consisted of a four-day site visit by a member of the SNL/NM P2 staff. During the visit, extensive interviews and discussions were held with personnel from the Paint Shop, FMT (Organization 8513-1), Facilities Planning and Engineering (Organization 8512), and Environmental Operations (Organization 8516). Site tours were conducted encompassing all Paint Shop operations and activities. This phase focused on clarifying how waste is generated and encouraging personnel to share ideas about P2 opportunities.

The information from the assessment was compiled and descriptions of waste volumes and the accompanying processes refined. Additional sessions to gather information on the purchase and use of materials were conducted on the phone and via e-mail.

An important fact discerned during this assessment was that Paint Shop personnel, with extensive guidance from the Lead Painter, are extremely conscientious and aware of the waste generated by shop processes. They constantly seek and implement P2 measures. In many cases, the staff had already evaluated the shop operations and implemented P2 opportunities based upon technical merit and the potential for waste reduction.

Because Paint Shop activities are heavily regulated by the state of California air emissions requirements, valuable information was gleaned from the data gathered to meet the requirements of air permit reporting, including rates of solvent use for each process.

Once P2 opportunities were identified, each one was evaluated according to criteria that included technical feasibility, regulatory issues, and ROI. Both vendors and SNL/CA compliance personnel were consulted. The options that were satisfactory from a technical and regulatory standpoint were then analyzed for potential ROI. This is discussed in more detail in the cost-benefit analysis (Attachment 1).

This report will be presented to FMT management staff for implementation. Although the implementation phase is not included in this report, it is a key part of the process. P2 personnel from SNL/NM and SNL/CA will assist Paint Shop management staff and personnel with implementation wherever possible. FMT will be expected to request funding for P2 opportunities and to take the lead on purchasing, installing, and operating new equipment. P2 personnel will also evaluate various funding sources and obtain funding when available. In addition, P2 staff will provide technical and regulatory assistance on an administrative level.

4.0 Waste Streams

At SNL/CA, the two most costly and frequently generated wastes are known as "hazardous" and "California regulated." For the purposes of this report, these types of waste will be referred to collectively as hazardous waste. These wastes are tracked via database from the point of

generation to disposal. The database contains extensive information on each waste container including generating organization, contact, weight, and waste category. Generators are charged for the waste they generate. The charges vary from $1.00 to $28.00 per kilogram depending upon the volume and types of waste. Waste costs in this report are estimated based upon current disposal costs and may not reflect actual charges.

A waste stream can be defined as a waste with consistent characteristics that is generated from a specific process. The primary hazardous waste streams generated from Paint Shop activities include solvents and materials contaminated with solvent-based paint, latex sump waste, and outdated or surplus paint. The Paint Shop waste streams cost nearly $30,000 a year for disposal. Waste generated from the Paint Shop accounts for 30 percent of Department 8513's total waste (see Figure 3) and about 50 percent of the total disposal costs. For these reasons, a separate PPOA was completed for the Paint Shop.

4.1 Paint Shop Processes and Wastes

Figure 4 lists waste streams generated from Paint Shop processes and illustrates the comparative volume of each waste stream. This PPOA considered potential waste reduction ideas for each of these waste streams. The most effective ideas were created for the five waste streams that together comprise 89 percent of the Paint Shop's total waste. Figure 5 shows the average annual quantities in kilograms of these top five waste streams. Figure 6 shows the average annual costs associated with those quantities. The top five waste streams are:

- Latex Paint
- Latex Sump Waste
- Solvents
- Solvent-Based Paint
- Solvent-Contaminated Debris

After a close evaluation of waste generating processes, it is clear that because of the extensive guidance from the Lead Painter, Paint Shop employees are extremely conscientious about reducing waste generation. They reuse empty paint cans wherever possible. They also reuse stirring sticks until they become unwieldy. They decant and reuse solvent after cleaning equipment whenever possible. They are careful to order just enough paint to reduce disposal of expired paint.

4.1.1 Latex Paint and Latex Sump Waste

Latex paint and latex sump waste are the two waste streams that make up the highest volume of waste at the Paint Shop. Latex painting comprises about 80 percent of the Paint Shop's work, which accounts for it being a large waste stream. Together, these waste streams comprise approximately $14,000 annually in disposal costs. The latex paint waste stream consists of expired or otherwise unusable paint. Its causes are administrative. The latex sump waste stream is generated during the clean-up phase of painting operations (Figure 7).

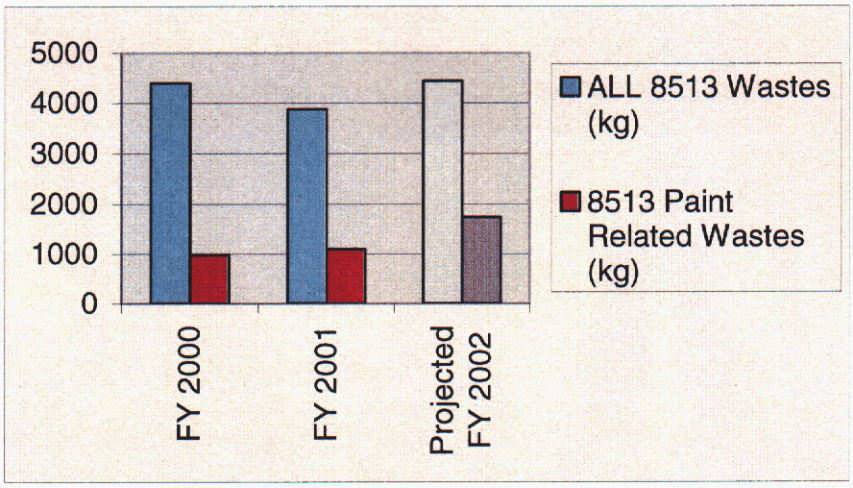

Figure 3. Comparison of Paint Waste With Other Waste Generated from Organization 8513.

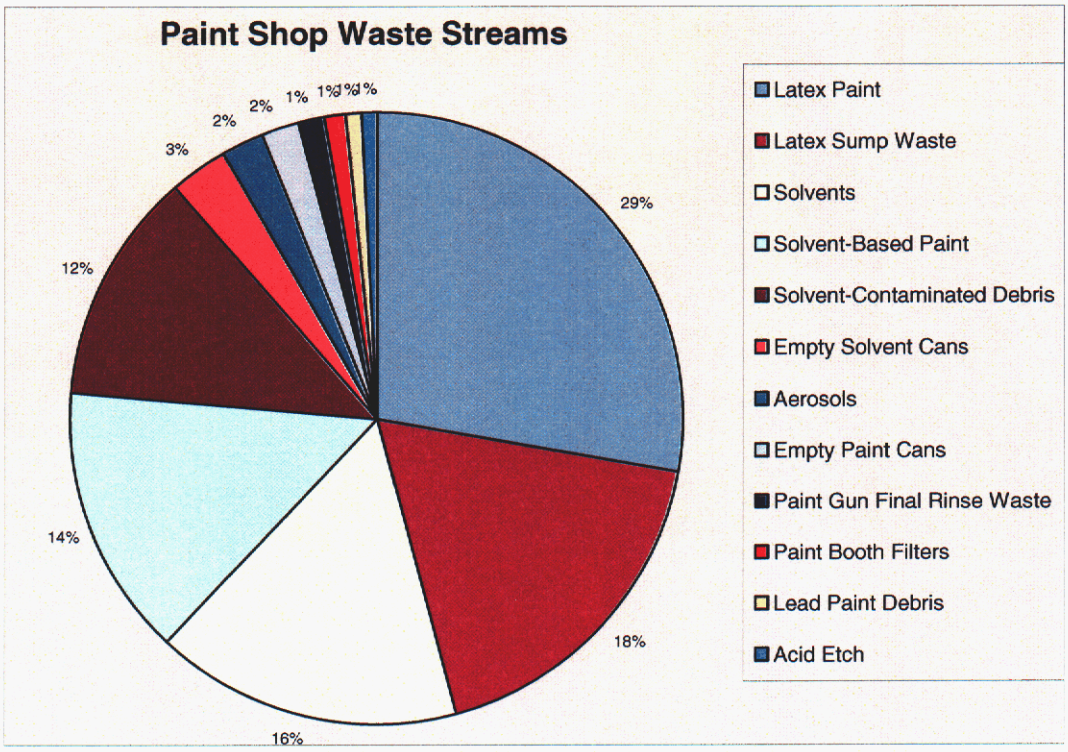

Figure 4. Paint Shop Waste Streams.

Figure 5. Quantities of Top Five Paint Shop Waste Streams.

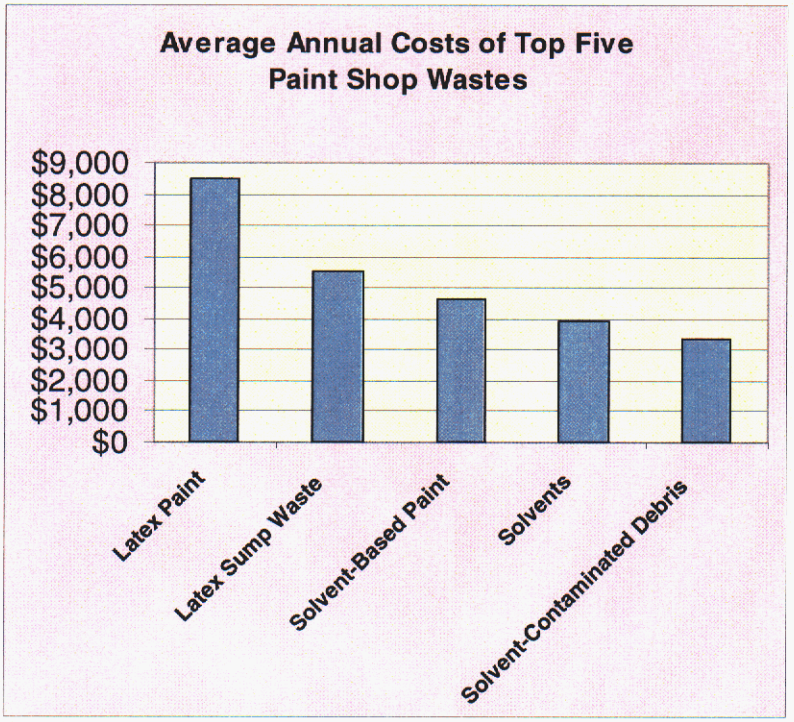

Figure 6. Average Annual Disposal Costs.

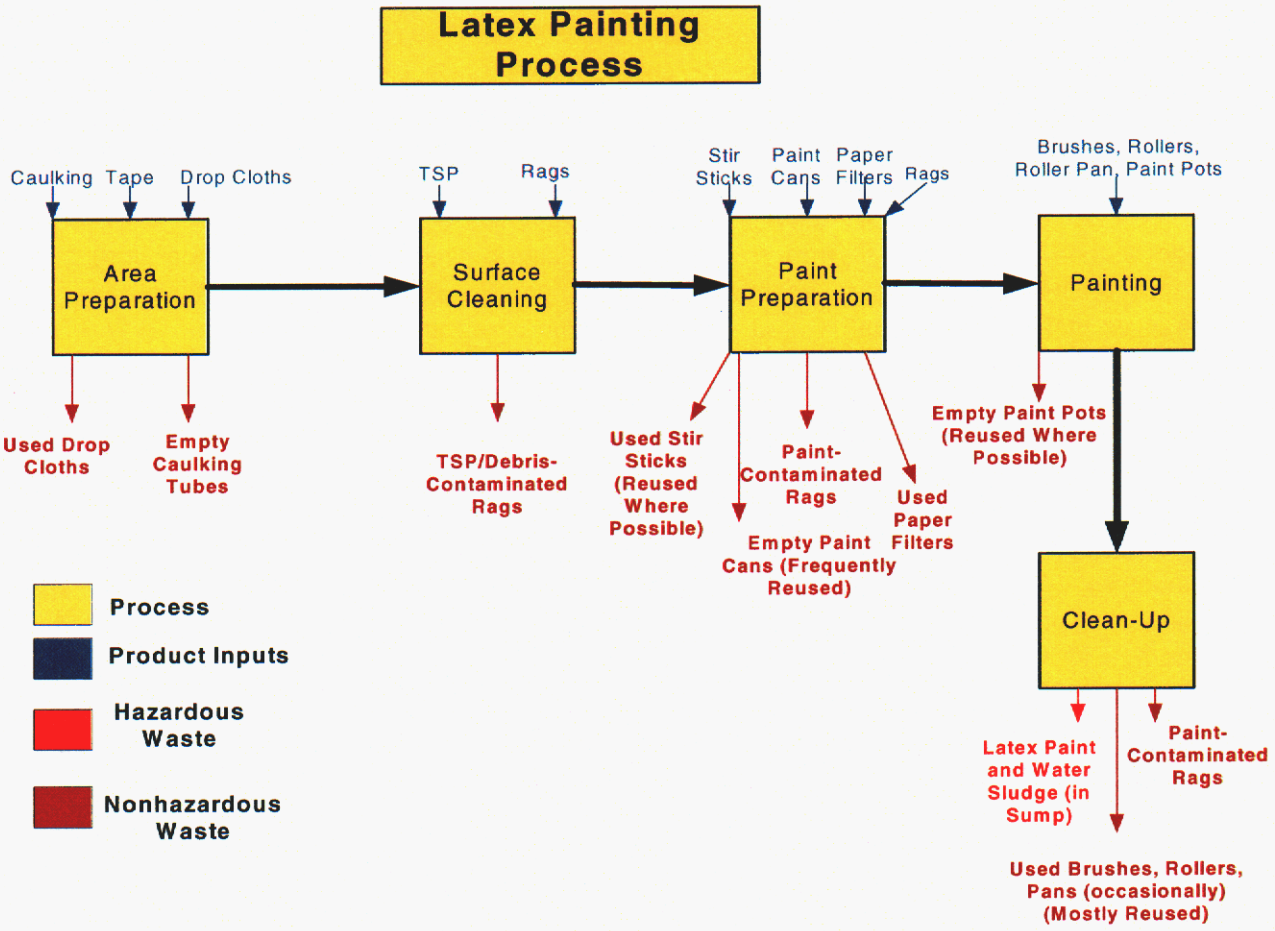

Figure 7. Latex Painting Process.

4.1.1.1 Latex Paint Waste

The administrative causes of the latex paint waste stream stem from three different issues. The first issue is a requirement that on-site construction contractors leave several gallons of paint matching the job they have completed. The reasoning behind this is to have the paint on hand in case repairs or maintenance are required. In reality, this paint often becomes outdated and unusable before it can be applied and therefore must be discarded.

The second cause results from frequent specification changes. Based upon both customer requirements and regulatory changes, the specifications for paint are often changed. These changes include color, quality, and volatile organic compound (VOC) content. It is difficult to predict when these changes might occur, but when they do, any paint in stock that does not meet the specifications becomes obsolete and must be disposed of. Paint Shop personnel are extremely cognizant of the possibility of changes and using "just-in-time" ordering principles has significantly reduced this waste stream.

The third cause of latex paint waste arises from conflicting work priorities. For example, the painters may be set up to complete a paint job in a certain building. Then, because of a sudden change of priorities, they may be required to direct their attention to another job of a different nature. This requires them to remove all preparations they have made for the current job and clean their materials before they can move to the new job, which generates additional waste that would not have been created had they continued on the original job.

4.1.1.2 Latex Sump Waste

The only hazardous waste generated from latex painting is from the clean-up process. Equipment, including brushes and rollers, is cleaned in the Paint Shop sink that is directly plumbed to a settling tank/separator system. Residues from paint, primer, and prep materials go into the sediment collection system, which consists of two 300-gallon bays. These bays are located underground on the west end of Building 963. The volume is recorded and checked periodically. When it reaches a predetermined level, the water and sludge mixture is removed from the tanks. Although the sludge accounts for only 6 to 10 cubic inches of the volume, the entire mixture is disposed of as hazardous waste. This process generates approximately 212 kilograms of waste annually at a cost of $5,500. This cost is expected to more than triple in 2003 due to increased regulatory requirements.

4.1.2 Solvent Waste Streams

Waste streams generated from solvent-based painting operations consist of solvent-based paint, solvent-contaminated debris, and spent solvent. These three waste streams collectively cost nearly $12,000 to dispose of annually.

Four different processes generate solvent-based paint waste:

- The paint spray booth
- Job site painting

- Roadway marking and striping

- Administrative issues that include overstocking, changes in specifications, and conflicting work priorities

Virtually all solvents and paints used in spray booth operations contain VOCs. This is an important consideration because VOCs are highly implicated in the creation of air pollution. These chemicals rapidly "volatilize" or disperse into the atmosphere when exposed to air. Because of this, materials used in the spray booth are subject to strict air emissions requirements contained in a permit issued by the Bay Area Quality Management District (BAAQMD). The permit requires detailed record keeping of all materials used so that emissions can be calculated, which is an expensive and time-consuming process for both the painters and SNL/CA air quality personnel. Labor, as well as air emissions, could be greatly reduced by decreasing the quantities of solvents used.

The painting process used in the spray booth is depicted in Figure 8. This process generates two major waste streams. Liquid solvent (the largest single solvent waste stream) results from cleaning spray guns, which are moved from the spray booth to a cleaning bench fitted with a laboratory-style hood. The surface of the bench, composed of stainless steel, is sloped toward a drain in the center. As the guns are cleaned, solvent and waste paint are collected from the drain in a container beneath the bench top. The solids are allowed to settle and the solvent is reused for as long as possible. Although solvents are decanted from the collection container and used as long as possible, both the sediments and spent solvents eventually require disposal as hazardous waste.

The second largest solvent waste stream, known as solvent-contaminated debris, involves rags, stir sticks, masking material, and containers. Rags are the largest component of this waste stream and are generated in large quantities during surface preparation (known as wipe cleaning) of metal substrates. Solvent is used to clean and degrease the metal prior to painting. Often, a second solvent application is required to remove any film. The solvent is applied and removed with rags.

All materials used in these processes including brushes, rollers, rags, drop cloths, edge taping, caulking, and personal protective equipment (PPE) are considered hazardous waste. Small parts, usually associated with weapons work, are painted in the spray booth. Larger, stationary substrates are painted in the field.

Field operations involving solvent-based painting (Figure 9) are not as common as spray booth operations and usually involve spray painting. As with the spray booth operations, solvent and solvent rags are the largest waste streams.

Road marking and striping, carried out approximately four to five times a year, generates relatively large quantities of solvent. Approximately 5 gallons of solvent are generated from cleaning the striper after every job.

Administrative causes of waste are similar to those discussed for latex paint (see Section 4.1.1.1).

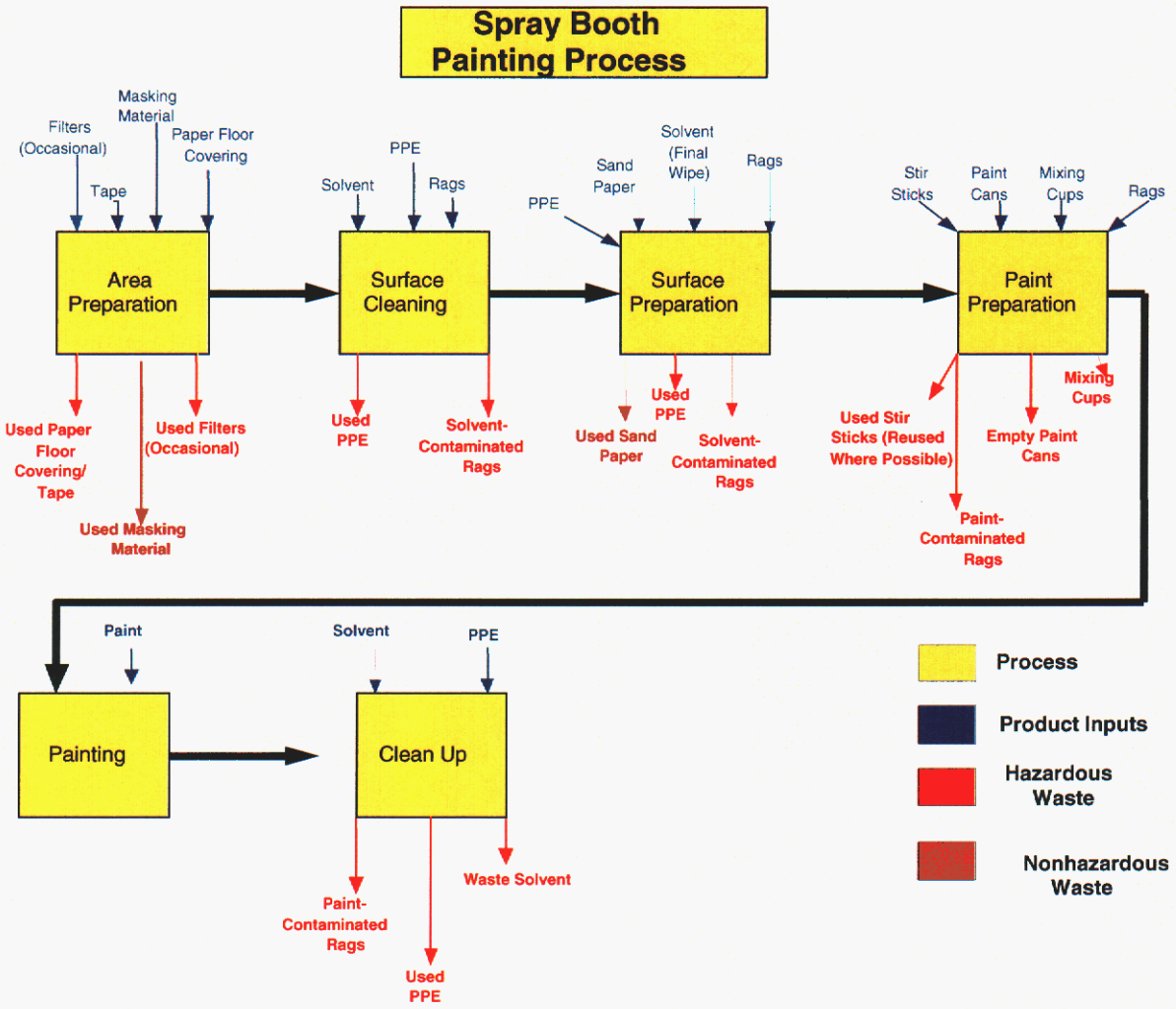

Figure 8. Spray Booth Painting Process.

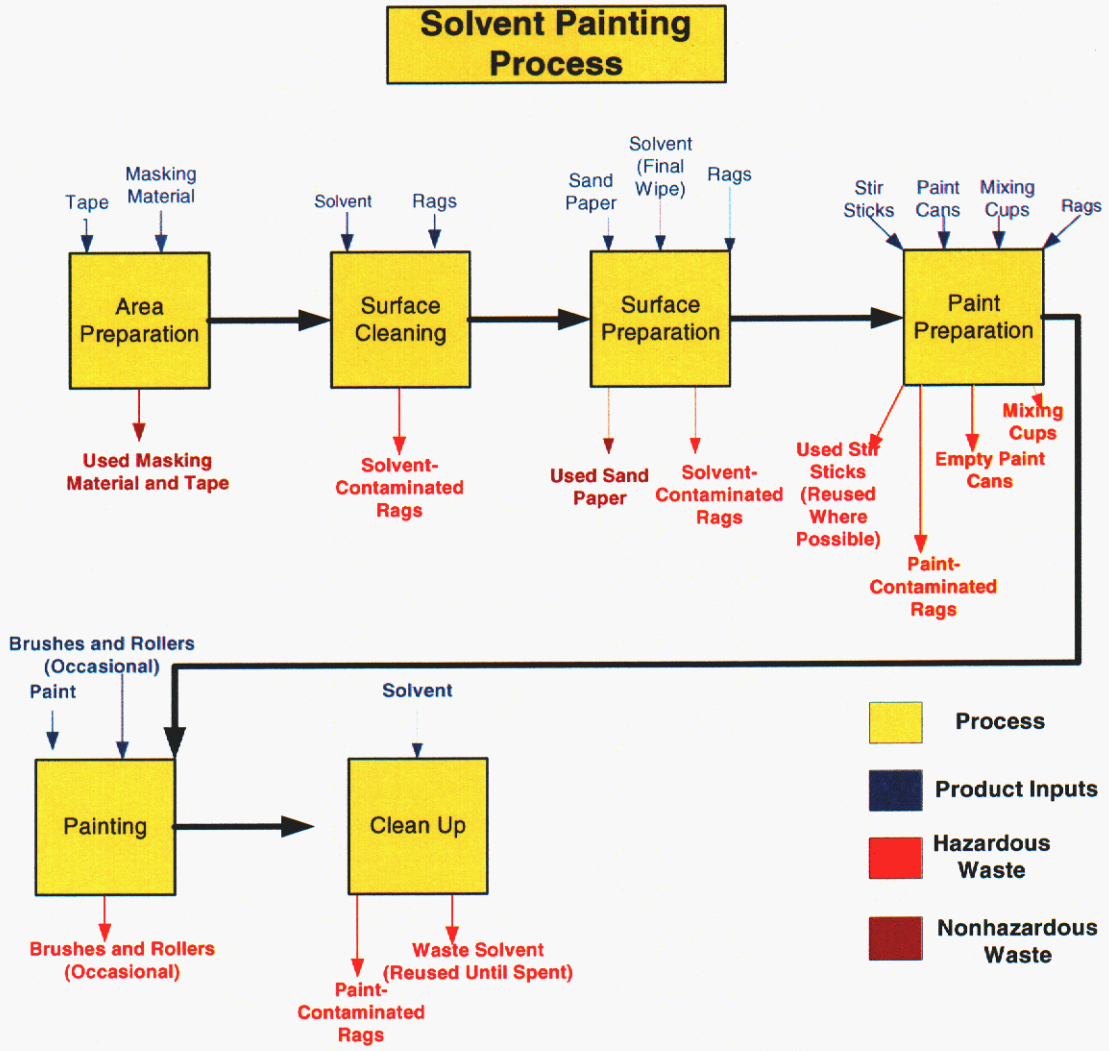

Figure 9. Solvent-Based Painting Process.

5.0 Pollution Prevention Ideas and Opportunities

After evaluating the waste stream data, a list of potential waste reduction ideas was developed. The ideas identified and evaluated are summarized below:

- Idea 1: Solvent Distillation Unit/Paint Gun Washer
- Idea 2: Parts Wash Rack
- Idea 3: Reduction or Elimination of Latex Paint Discharges to the Sump
- Idea 4: Specification Modifications
- Idea 5: Work Control Changes
- Idea 6: Use of Nonhazardous Solvents
- Idea 7: Use of Plastic Road Stencils Instead of Painting
- Idea 8: Use of a Bag Filter to Reduce Latex Paint Solids Being Released from the Paint Shop Sink to the Sewer System

Ideas 6, 7, and 8 were rejected for the following reasons:

- Idea 6, using non-hazardous solvents, was considered in order to reduce the solvent waste stream for wipe cleaning and other uses. It was rejected based on lack of effectiveness. A bench scale test of a non-hazardous solvent demonstrated that cleaning times were much longer and the substrates were not cleaned adequately. Another potential application of non-hazardous solvents could be cleaning of brushes and equipment. However, a nonhazardous solvent would be contaminated with solvent-based paint and still yield a hazardous waste. Another drawback is that nonhazardous solvents cannot be recycled.

- Idea 7, using plastic road stencils instead of painting, was considered in order to reduce solvents generated from this process during clean up. This idea was rejected based upon feasibility and cost. Using plastic stencils requires a large operation to effect economies of scale with respect to the purchase of the equipment. SNL/CA paints road striping only at infrequent intervals each year.

- Idea 8, using a bag filter, was eliminated after discussing the prospect with FMT plumbers. It was determined that bag filters do not work well with gravity flow, and a pump would have to be installed to provide appropriate flow rates. Simply eliminating the practice of washing paint containing heavy metals down the sink would eliminate the need for the filter.

Ideas 1 through 5 were selected for additional investigation and became five opportunities recommended for implementation. A cost-benefit analysis (see Attachment 1) was performed for Opportunities 1 and 2, which involve capital equipment purchases. Each opportunity is

discussed in Chapter 6, and all five opportunities are recommended for implementation. These opportunities show annual cost savings with quick payback periods and significant reductions in hazardous waste, air emissions, material purchases, and employee exposure to hazardous materials.

6.0 Description and Analysis of P2 Opportunities

6.1 Opportunity 1: Solvent Distillation Unit/Paint Gun Washer

An on-site distillation unit would recycle all solvents used in the Paint Shop. Recycling provides a number of benefits including:

- Extending solvent life and thus reducing purchases of virgin solvent
- Reducing waste generation
- Decreasing air emissions
- Producing significant ROI and life-cycle cost savings

A paint gun washer is an apparatus that attaches to the paint guns used in the spray booth. It provides closed-loop cleaning and is more efficient than cleaning by hand. The benefits of a paint gun washer include:

- Improved paint gun cleaning efficiency
- Reduced employee exposure to hazardous solvents
- Decreased emissions of VOCs

Current annual average disposal costs for spent solvent amount to approximately $4,000. A distillation unit/paint gun washer combination would reduce the waste generated by approximately 75 percent, reducing costs by $3,000 per year. Approximately 69.5 gallons of solvent are purchased each year at a cost of $260.60. These costs would also be reduced by approximately 75 percent showing an annual savings in purchase costs of nearly $200. The ROI is estimated to be approximately 70 percent.

Attachment 2 includes general information on solvent distillation as well as vendor information. There are regulatory issues associated with the distillation and storage of solvent. According to conversations with SNL/CA Environmental Operations personnel, recycling solvent is not considered to be treatment of hazardous waste. However, certain labeling and storage requirements must be met. Therefore, it is crucial to ensure this project is approved through the Interdisciplinary Team (IDT) to ensure all regulatory requirements will be met prior to purchasing the equipment.

6.2 Opportunity 2: Parts Wash Rack

The Parts Wash Rack, a closed-loop, aqueous spray system, would replace the current method of cleaning metal parts by hand in preparation for painting. This system features a single-stage cleaning process using hot, pressurized water. All water is collected, filtered, and recycled. The

system contains an oil separator and filter unit that will remove oil and particulate matter from the water. Attachment 3 provides equipment information on the Parts Wash Rack.

Benefits of purchasing this equipment include:

- Decreasing the quantity of waste disposal (85 percent reduction)
- Reducing material purchases
- Reducing PPE purchases
- Reducing employee exposure to hazardous materials
- Eliminating solvent emissions from the Paint Spray Booth
- Significantly reducing labor
- Reducing reporting time necessary to meet air permit requirements

Another significant reason to purchase this equipment relates to new air regulations soon to be promulgated by the BAAQMD that will virtually prohibit use of all solvents currently in use in the spray booth. Purchase of the new equipment will allow SNL/CA to easily comply with these new regulations.

Wastewater will occasionally be generated from the water recycling unit. SNL/CA Environmental Operations personnel have tentatively stated that this water will not contain regulated constituents and can therefore be disposed of in the city sewer. The water will have to be sampled prior to release. Even if the water is disallowed from release to the sewer, an annual disposal cost will be minimal. As mentioned in the discussion of the solvent distiller (see Section 6.1), it is recommended that, prior to purchase, this equipment be evaluated by the IDT.

6.3 Opportunity 3: Specification Modifications

This opportunity could significantly reduce two of the largest waste streams generated by the Paint Shop: latex and solvent-based paint. It involves a simple proposal to make two modifications to SNL/CA's construction specifications and includes:

- Reducing the types and colors of paint called for in the specifications
- Eliminating the requirement that contractors leave extra paint on site

Currently, 75 different colors of paint are used, which could easily be reduced to 25. These simple specification changes would not only reduce waste but would also free up valuable storage space in the Paint Shop.

Eliminating the requirement that contractors leave paint after their jobs are completed would significantly reduce this waste stream. Currently, paint that is left behind by contractors has to be disposed of because it becomes outdated. Contractors can simply provide the paint codes for the paint.

The Lead Painter estimated that approximately 85 percent of the latex and solvent-based paint waste streams could be eliminated with these specification modifications. Currently, these waste

streams generate 43 percent of the Paint Shop's waste streams. Reducing these waste streams equates to an annual savings of more than $11,000.

6.4 Opportunity 4: Work Control Changes

As described in Chapter 4 of this report, unplanned changes in work priorities cause unnecessary generation of waste. Although it is difficult to estimate how often these priorities change, it can be estimated that approximately 10 kilograms of waste are generated for each mid-stream change. This waste costs SNL/CA approximately $280 in disposal costs. Although a relatively small dollar amount, it should be considered as a factor when priorities are being re-evaluated.

6.5 Opportunity 5: Reduction or Elimination of Latex Paint Discharges to the Sump

As stated in Section 4.1.1.2, waste from the latex sump is one of the top five waste streams in both quantity and cost.

The recommendation for this waste stream involves the following measures:

- Eliminate the sump and plumb the Paint Shop sink directly to the sewer system.
- Use liners in paint buckets to reduce the amount of paint waste being washed down the sink. The liners could be removed at the end of a job, allowed to dry and discarded (see Attachment 4).
- Place a mesh screen in the bottom of the sink to capture the solid paint waste (skins). Remove, dry, and dispose of the skins as sanitary solid waste. Dispose of wastewater through the sanitary sewer.
- Eliminate all paints containing lead, barium, zinc, chromium, and copper pigments. If this is not possible, ensure that after using these paints, the equipment is not cleaned in the sink.
- Collect paint that is not to specifications in a drum for recycling.

7.0 Conclusion

The five opportunities identified in this report can significantly reduce the cost and waste generation rates for the Paint Shop. Given the significant potential for ROI on the equipment investments (Opportunities 1 and 2), it is recommended that the opportunities be implemented after evaluation by the IDT. Opportunities 3 and 4 involve changes in administrative operations and procedures that could be adopted by FMT effective immediately. Because the Paint Shop staff is cognizant of the waste generated and alert to opportunities to reduce it, Opportunity 5 represents modifications to Paint Shop processes that the staff could easily put into operation. In addition, by implementing these five recommendations, FMT will reduce its regulatory liability and reporting requirements while achieving improved operating efficiency and worker safety for the Paint Shop staff.

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ATTACHMENT 1

Cost-Benefit Analysis

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Option:Solvent Distillation/Paint Gun Washer

Worksheet 1: Operating and Maintenance Annual Recurring Costs

Expense Cost Items	Before (B) Annual Costs		After (A) Annual Costs
Equipment			
Purchased Raw Materials and Supplies	261		62
Process Operation Costs:			
Utility Costs			
Labor Costs			
Routine Maintenance Costs for Processes			
Process Costs			
Other			
Subtotal	$261		$62
PPE and Related Health/Safety/Supply Costs			
Waste Management Costs:	4000		1000
Waste Container costs			
Treatment/Storage/Disposal Costs			
Inspection/Compliance Costs			
Subtotal	$4,000		$1,000
Recycling – Material Collection/Separation/Preparation Costs:			
Material and Supply Costs			
Operations and Maintenance Labor Costs			
Vendor Costs for Recycling			
Subtotal	$0		$0
Administrative/Other Costs			
Total Annual Cost:	$4,261		$1,062

Worksheet 2: Itemized Project Funding Requirements (One-Time Implementation Costs)

Category	Cost $
INITIAL CAPITAL INVESTMENT	
Design	
Purchase	$4,000
Installation	
Other Capital Investment (explain)	
Subtotal: Capital Investment = (C)	$4,000
INSTALLATION OPERATING EXPENSES	
Planning/Procedure Development	
Training	
Miscellaneous Supplies	
Startup/Testing	
Readiness Reviews/Management Assessment/Administrative Costs	
Other Capital Investment (explain)	
Subtotal: Installation Operating Expenses = (E)	$0
All company adders (G&A/PHMC Fee, MPR, GFS, Overhead, taxes, etc.)	
Total Project Funding Requirements = (C + E)	$4,000
Useful Project Life (L) (Years)= 10	Time To Implement (M 3
Estimated Project Termination/Disassembly Cost (if applicable) (D) =	
RETURN ON INVESTMENT CALCULATION	
ROI = (B – A) – [(C + E + D)/L] x 100 =	69.98%

O&M Annual Recurring Costs		Project Funding Requirements	
Annual Costs, Before (B) =	$4,261	Capital Investment (C) =	$4,000
Annual Costs, After (A) =	$1,062	Installation Op Expenses (E) =	$0
Net Annual Savings (B – A) =	$3,199	Total Project Funds (C + E) =	$4,000

Solvent Distillation/Gun Washer

Worksheet 3: Estimate Basis

INITIAL CAPITAL INVESTMENT

Equipment and installation costs are based upon an estimate by a distillation system distributor.

INSTALLATION AND STARTUP

EXISTING TECHNOLOGY

Material costs are based upon and estimate based upon solvent usage data tracked for the Air Permit. Usage for the gun washer is approximately 22.5 and other solvent used excluding wipe cleaning are estimated at 47 gallons per year for a total of 69.5 The average cost of the solvent is approximately $3.75 per gallon. Waste management costs are based upon the average annual generation rate of solvent waste.

PROPOSED P2 TECHNOLOGY

According to the manufacturer's estimate as well as estimates in P2 information, solvent distillation units can be expected to reduce solvent purchases as well as waste by about 75 percent.

COST SAVINGS, COST AVOIDANCE, AND RISK REDUCTION

Cost savings are based reduced purchases of solvent and waste generation.

Project Title	Option:Solvent Distillation/Paint Gun Washer		
Implementation Cost ($)	4,000	**Year Initiated**	2004
Project Life (years)	10		

Annual Expenditures

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Sum	Present Value in 2004
Base Case:													
Annual cost	4,261	4,261	4,261	4,261	4,261	4,261	4,261	4,261	4,261	4,261	4,261	46,871	$40,240
													$0
													$0
													$0
Total Base Case	**4,261**	**4,261**	**4,261**	**4,261**	**4,261**	**4,261**	**4,261**	**4,261**	**4,261**	**4,261**	**4,261**	**46,871**	**$40,240**
											Net Present Value in 2004, Base Case		**$40,240**
P2 Project:													
Implementation cost	4,000											4,000	$4,000
Annual cost	1,062	1,062	1,062	1,062	1,062	1,062	1,062	1,062	1,062	1,062	1,062	11,682	$10,029
Decommissioning Cost											-		$0
													$0
Total P2 Project	**5,062**	**1,062**	**1,062**	**1,062**	**1,062**	**1,062**	**1,062**	**1,062**	**1,062**	**1,062**	**1,062**	**15,682**	**$14,029**
											Net Present Value in 2004, P2 Project		**$14,029**

Results Summary:

Life Cycle Savings (NPV Base Case - NPV P2 Project) = $26,211

Life Cycle Cost Savings per $ Invested = 655%

Real Discount Rate 3.2%

Option: Parts Wash Rack

Worksheet 1: Operating and Maintenance Annual Recurring Costs

Expense Cost Items	Before (B) Annual Costs		After (A) Annual Costs
Equipment			
Purchased Raw Materials and Supplies	321		
Process Operation Costs:			
Utility Costs			
Labor Costs	$6,000		$120
Routine Maintenance Costs for Processes			
Process Costs			
Other			
Subtotal	$6,321		$120
PPE and Related Health/Safety/Supply Costs	1600		
Waste Management Costs:	3372		1056
Waste Container costs			
Treatment/Storage/Disposal Costs			
Inspection/Compliance Costs			
Subtotal	$4,972		$36
Recycling – Material Collection/Separation/Preparation Costs:			
Material and Supply Costs			
Operations and Maintenance Labor Costs			
Vendor Costs for Recycling			
Subtotal	$0		$0
Administrative/Other Costs			
Total Annual Cost:	$12,893		$1,092

Worksheet 2: Itemized Project Funding Requirements (One-Time Implementation Costs)

Category	Cost $
INITIAL CAPITAL INVESTMENT	$30,095
Design	
Purchase	
Installation	
Other Capital Investment (explain)	
Subtotal: Capital Investment = (C)	$30,095
INSTALLATION OPERATING EXPENSES	
Planning/Procedure Development	
Training	
Miscellaneous Supplies	
Startup/Testing	
Readiness Reviews/Management Assessment/Administrative Costs	
Other Capital Investment:Utility Hookups	$3,000
Subtotal: Installation Operating Expenses = (E)	$3,000
All company adders (G&A/PHMC Fee, MPR, GFS, Overhead, taxes, etc.)	
Total Project Funding Requirements = (C + E)	$33,095

Useful Project Life (L) (Years)=	10	Time To Implement (Months)=	6
Estimated Project Termination/Disassembly Cost (if applicable) (D) =			

RETURN ON INVESTMENT CALCULATION	
ROI = (B – A) – [(C + E + D)/L] x 100 =	25.66%

O&M Annual Recurring Costs		Project Funding Requirements	
Annual Costs, Before (B) =	$12,893	Capital Investment (C) =	$30,095
Annual Costs, After (A) =	$1,092	Installation Op Expenses (E) =	$3,000
Net Annual Savings (B – A) =	$11,801	Total Project Funds (C + E) =	$33,095

Parts Wash Rack

Worksheet 3: Estimate Basis

INITIAL CAPITAL INVESTMENT
The cost is based upon the lowest estimate from two manufacturers. They have both stated there will be no installation cost.

INSTALLATION AND STARTUP
This is an estimate of the cost to bring water and power to the parts washer unit.

EXISTING TECHNOLOGY
Material costs are based upon estimate given by Scott Keith based upon solvent usage data tracked for the Air Permit. Usage for wipe cleaning is approximately 10.8 gallons per year with average cost of the solvent is approximately $3.75 per gallon. Material costs also include purchase of rags ($125 per bag, 3 bags per year, 75 percent used for wipe cleaning). Safety and health costs include purchase of PPE for personnel engaged in wipe cleaning (40 parts cleaned per year multiplied by $40.00 per job for PPE.) Reduced labor costs were included in this calculation since they are significant. Each part currently takes 3 hours to clean. The same part can be cleaned with the parts washer in 10 minutes. Waste management costs are based upon 75 percent of solvent contaminated debris disposal costs.

PROPOSED P2 TECHNOLOGY
The estimate is based upon cleaning with hot water only. It assumes that 10 gallons or 36 kg of sludge will be generated from the parts washer each year.

COST SAVINGS, COST AVOIDANCE, AND RISK REDUCTION
Cost savings are based upon the reduced purchases of wipe cleaning solvents and disposal of solvent debris.

Project Title	Option: Parts Wash Rack
Implementation Cost ($)	33,095
Project Life (years)	10
Year Initiated	2004

Annual Expenditures

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Sum	Present Value in 2004
Base Case:													
Anual cost	12,893	12,893	12,893	12,893	12,893	12,893	12,893	12,893	12,893	12,893	12,893	141,823	$121,759
													$0
													$0
													$0
Total Base Case	**12,893**	**12,893**	**12,893**	**12,893**	**12,893**	**12,893**	**12,893**	**12,893**	**12,893**	**12,893**	**12,893**	**141,823**	**$121,759**
											Net Present Value in 2004, Base Case		**$121,759**
P2 Project:													
Implementation cost	33,095											33,095	$33,095
Annual cost	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	12,012	$10,313
													$0
Total P2 Project	**34,187**	**1,092**	**1,092**	**1,092**	**1,092**	**1,092**	**1,092**	**1,092**	**1,092**	**1,092**	**1,092**	**45,107**	**$43,408**
											Net Present Value in 2004, P2 Project		**$43,408**

Results Summary:

Life Cycle Savings (NPV Base Case - NPV P2 Project) = $78,351

Life Cycle Cost Savings per $ Invested = 237%

Real Discount Rate 3.2%

ATTACHMENT 2

Equipment Information on Solvent Distillation Unit and Paint Gun Washer

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Fact Sheet: Considerations for Selecting a Distillation Unit for On-Site Solvent Recycling

Office of Waste Reduction Services
State of Michigan
Departments of Commerce and Natural Resources
December 1991
#9005A
Rev. 2/93

Organic solvents used in commercial and industrial processes can be costly. They can also be detrimental to the environment when improperly disposed. A reduction in the amount of solvents used - or recycling spent solvent - is a profit-enhancing business strategy. After exploring all source reduction options for reducing the amount of spent solvent generated, including the use of non-solvent substitutes or reducing the amount of solvent loss during use, many solvent users recycle their spent solvent as a way to reduce procurement and disposal costs.

Small solvent recycling units are now available and are economically feasible for businesses that generate spent solvent. These "distillation units" or "stills" boil the spent solvent and condense the vapors into a clean liquid solvent for reuse in the same or a different process. Businesses can choose to recycle solvents by on-site distillation or by employing an outside solvent recycling service. Consider the following factors when determining whether to purchase a still to recycle spent solvent on site.

Initial Considerations

The first question is whether on-site solvent recycling will yield a usable product. Can the recycled solvent be used successfully within the company? Using a still will only be practical if the recycled solvent has a composition that will enable it to be:

a. Used in the initial process
b. Used in another in-house process or
c. Sold to another solvent user.

In many cases, blends of solvents are used in cleaning processes. Simple distillation of solvent blends often yields products that differ in composition from the original blends. The recycled solvents may be satisfactory for some cleaning processes, but may not be usable for the original process.

In other cases, such as with 1,1,1 dichloroethane, the solvent may break down and become acidic during use, which affects the ability to recycle the solvent. Distillation does not return this solvent to its original composition. Normally, make-up solvent must be added to replace that lost in evaporation and in the still bottoms.

This replacement solvent will usually keep the acid stabilizer level at the proper percentage. In some applications, stills cannot effectively handle mixed spent solvents having a range of boiling

points. It is therefore necessary to keep different types of spent solvents segregated. In these cases, employees must be trained to avoid mixing solvents.

A special consideration for some printing and painting processes is whether the ink, paint, or lacquer being used contains nitrocellulose. Because nitrocellulose burns readily at elevated temperatures and decomposes exothermically in a gaseous state, special precautions must be taken when recycling solvents containing the material. The distillation of these materials requires special operational (vacuum) and monitoring equipment (temperature measurement and control) as well as backup safety system (water quench). It is of the utmost importance that the equipment manufacturer's system and recommendations be investigated carefully to ensure that a safe "nitrocellulose package" is included.

Equipment Considerations
Before buying a still, ask the supplier the following questions:

1. Will the unit distill the solvent without the need for a vacuum? Vacuum units are generally more expensive than units operated under standard pressure, but they do offer advantages. Vacuum units can provide a safer environment because the equipment operates at lower temperatures, reduces the creation of odors (sulfur) and avoids possible exothermic reactions (nitrocellulose).

2. Will the supplier distill a sample of the spent solvent with the proposed still system and provide a gas chromatograph of the recycled solvent? This will enable you to evaluate the quality of the distilled product and determine what percentage of the waste can be recovered.

3. How efficient will the distillation process be? If the material that will be distilled contains low solids, the efficiency of recovery will be high. On the other hand, high solids content may form "insulation" between the solvent and the heat source, which will reduce the efficiency of the recovery. The inclusion of an internal boiler scraping mechanism will avoid this "insulation" effect and maintain high system efficiency.

4. Will any of the still's components deteriorate after extended use? Only stainless steel and Teflon fittings and gaskets will stand up to repeated use with some solvents.

5. What are the still operating costs? Make sure that labor costs, electricity and the cost of liners are included. Compare these costs with projected savings from reduced purchases of virgin solvent.

6. How will still bottoms be managed? Evaluate how easily still bottoms can be removed from the evaporation chamber and how much it will cost per drum for disposal (most still bottoms are handled as hazardous wastes through fuel blending programs or incineration). How does this cost compare with the costs of recycling the spent solvent at an off-site recycler or for disposal as a fuel?

7. Will you need to modify your present set-up to operate the still? How much area will the still occupy? Can the still be set up easily? Will a highly skilled worker be required to operate and maintain the system? Consider the costs associated with these questions.

8. Inquire about the following safety features:

   a. Does the unit shut down automatically:
      i. If there is a water failure?
      ii. If the pot temperature goes above a certain temperature?
      iii. If the water temperature in the condenser goes above a certain temperature?

   b. Is there a pressure relief valve in case the pressure goes above a certain level?

   c. Will the unit sense when all solvent has been distilled to prevent the process from "cooking the bottoms"?

   d. Are all electrical controls explosion-proof and made with Underwriter Lab-approved components?

   e. Does the unit have a feature that prevents opening the evaporation chamber until after it has cooled to a certain temperature?

9. Is the vapor that results from distillation cooled to a liquid by water or by air movement? Air-cooled fans with electric motors generally are not classified as explosion-proof. In addition, electric fans are not as effective as water in condensing solvent vapor.

10. Can the manufacturer offer a "complete system" that ensures a safe operation? Are storage tanks, level controls and vacuum receiver?

Regulatory Considerations

1. Is there a safe location for the still? Will the still give off fumes that require special ventilation? The still should be in a well-ventilated area, away from all sources of sparks and flames. The local fire department, building inspector and your insurance company should be consulted to ensure that all requirements are being met.

2. Generators of hazardous waste must comply with state and federal requirements. The solvent to be recycled and the solvent still bottoms must be managed in accordance with hazardous waste storage and container labeling requirements. Additionally, off-site disposal of the solvent still bottoms may require the generator to do the following:

   1. Obtain a USEPA generator identification number
   2. Use the Uniform Hazardous Waste Manifest (shipping paper)
   3. Ship wastes to a licensed hazardous waste facility
   4. Use licensed transporters to ship the wastes
   5. Maintain waste recorders
   6. Comply with training and contingency plan requirements.

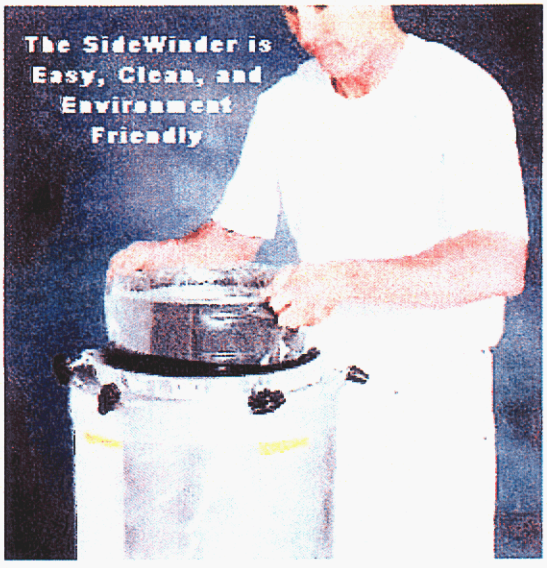
The determination of the specific hazardous waste management requirements that you must comply with is dependent upon the quantity of all hazardous wastes being generated and/or accumulated at your site.

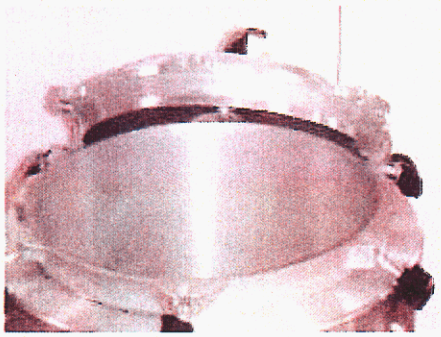
The considerations listed above should not be considered a complete list, but rather some of the more common points to evaluate.

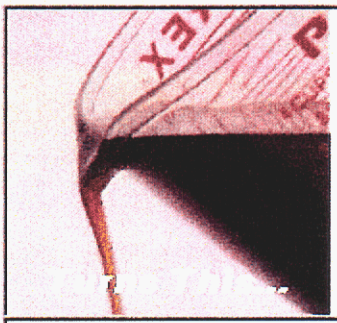
Samples of Vendor Information on Solvent Distillation Units/Paint Gun Washers

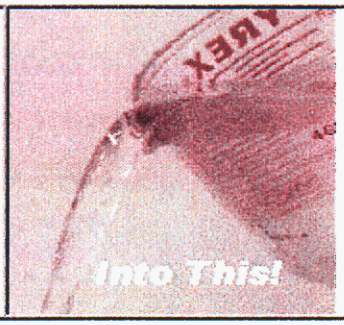
SIDEWINDER
MODEL M 7
SOLVENT RECOVERY SYSTEM

Sidewinder/Persyst Enterprises, Inc.
4695 Melvin Street
Las Vegas, NV 89115
ph (702) 362-9432
fax (702) 362-9440
e-mail persyst@worldnet.att.ne









Saves your business money and time every day with Sidewinder.

WHY?

Hazardous waste recycling is one of the few areas where national environmental goals, industries economic interests and public health and safety issues clearly coincide. For industry, the benefits include reduced costs, liabilities, and regulatory burdens associated with hazardous waste management. For the general public, waste minimization pays off in our improved environment.

Our nation has interests in minimizing the overall amounts of hazardous waste being transported on our highways and stored at hazardous waste sites. The EPA tailors rules and regulations to encourage on site recycling and reuse.

Of course, to dispose of hazardous wastes in any unlawful way is just foolhardy and a good way to risk heavy cleanup costs, stiff fines and possible jail time.

WHAT?

The Sidewinder Model M-2 Solvent Recovery System, made in the USA, has become Industry's number one choice because it's hassle free and saves dollars. Load it with dirty solvent, press the button, you're done. Self-monitoring, it turns off automatically and you have clean gun wash and cleanup solvents, ready for reuse.

The Sidewinder reduces the volume of hazardous materials on site and all but eliminates the need to transport liquid hazardous waste on our streets and highways.

Frequently asked questions

How long does it take to do a batch?

Typically, heat up time of an hour or two, and a gallon an hour, but it depends on many variables. What solvent? How dirty? Humidity and barometric pressure? Elevation? Latent heat characteristics, etc. The Sidewinder was designed to process 50 gallons a week, during a five-day workweek. If a user processes 50 gallons a week and his expense to buy plus legal disposal is a conservative $5.00 a gallon, the Sidewinder will pay for itself in 14-15 weeks. If time is a problem you need more units to put more money back in your pocket. Check with your accountant for the tax benefits.

What do I do with the waste left over?

We must tell you to treat the residue as hazardous waste until your local landfill and environmental officials tell you otherwise. But, now you are probably a small quantity generator. EPA likes what you're doing and will work with you. More lenient laws now apply to you. Continue to accumulate the small amount of residue in a 55-gallon drum. Once it is full and capped, you have at least six more months to have it hauled away.

Does it cost more to have the residue hauled away?

Not in real terms. Picture yourself generating a drum of waste a month at $150.00 without a Sidewinder. That's $5,400.00 every three years, right? With a Sidewinder you could generate in the neighborhood of a drum of residue at about $350.00 every three years.

I have some really old thinner on hand. Can I recycle it?

As often as not, people do not really know for sure what is in the old collection. If this is your case, take your lumps and dispose of the waste. This application is where we see the worst compatibility problems with old solvents and acids, water, nitrocellulose, corrosion, etc. Use a Sidewinder in your day-to-day processing and you won't accumulate this problem again.

Do I need a new five gallon can for each batch?

Where people are playing catch up and processing an old really dirty collection of waste you may wish to use a Sidewinder processing bag to line the cooking bucket. Typically people use a few dedicated cooking buckets for current day-to-day processing. In many cases the residue will begin to crumble like old pavement after several batches and can be crumbled and dumped out, however, most people prefer the convenience of the Sidewinder processing bag.

What about processing bags?

Many people find it convenient to use Sidewinder processing bags in their waste management programs. You must still use a bucket if you choose to use Sidewinder processing bags. Just place the Sidewinder processing bag in a clean open top metal bucket and fold down the sides

like lining a waste can. For best results when using Sidewinder processing bags, start with a clean open top metal bucket, bags will stick to dirty buckets containing paint or coatings residue.

What kind of warranty do I get?

One year limited warranty. Ask your dealer for a copy.

What about service after the warranty?

There are two PC boards, which can be unplugged and replaced. The heating assembly is also replaceable. The units are easily serviceable by any mechanical person.

What is nitrocellulose?

Nitrocellulose is an ester of cellulose and nitric acid. It is used as a component of many lacquers, inks, adhesives and cements. It becomes very unstable when heated and dry. It auto ignites at 275 F - 330 F in a violent, exothermic reaction to form a dense cloud containing potentially toxic levels of nitrogen oxides and carbon monoxide. It is extremely corrosive. Do not process nitrocellulose in your Sidewinder. It is dangerous and related damage is not covered by warranty.

What is the operating pressure?

The Sidewinder operates at the prevailing atmospheric pressure. It is not a pressurized device.

Do I need the Insulation Bonnet?

The Bonnet fits over the Sidewinder to minimize heat loss while its outer surface stays near room temperature. It is required for high boil temp solvents like mineral spirits. It is suggested for operating in cooler climates or for use as an added safety heat barrier. The energy saved in most cases can pay for the bonnet over the first year in use.

Do I have to shut it off?

No, the Sidewinder has control logic that monitors the process and turns itself off when finished.

How long have you been in business?

Happily, since 1988.

Can I turn it off?

Yes, push the button to turn off the red light. The Sidewinder will proceed with a shutdown cycle.

What does Class I, Division 1 hazardous location mean?

If a recycler is not certified by a Nationally Recognized Testing Laboratory for use in a normal location, it did not pass the vapor concentration test for normal locations (U.S Fire Code requires that a solvent distillation unit must be used only in locations in accordance with its listing) you must build a special room to house the potentially "hazardous" unit. Look around your shop. Do you have normal or weird special classified lighting? Do you have normal or weird looking electrical outlets and switches on the wall? Do you use normal electrical devices (drill motors, coffee pots, air compressors, welders, etc.) or special devices marked Class I, Division 1? If everything is normal, get a Sidewinder Model M-2 Recycler, certified by UL for use in normal locations.

What kind of maintenance is there?

Maintenance is simple. Check the clean solvent outlet tubes for obstructions before each batch. Keep the unit and its operating area clean and clear of debris. Follow the periodic maintenance schedule in the owner's manual.

Can I use a plastic bucket?

No, it will melt and make a big mess.

Can I change the temperature myself?

There is limited customer adjustability. Always consult the factory prior to making any adjustments.

Do I need a bigger machine?

We've discovered that to double the machine size in order to process 100 gallons a week, would more than double the cost to the customer for the larger unit. If you need to process more than 50 gallons a week, two machines is the cost effective answer.

Can I move the Sidewinder to another location?

The unit must be bolted to the floor and hard wired. If moving the unit is required, be sure it is empty of solvent. If the unit must be tipped on its side, be sure the electrical box and refrigeration grille are up and the logo face panel and on/off button are face down.

Is the recycled solvent as good as the new?

I can tell you yes. Better yet, let your dealer show you. You be the judge.

Can you list the solvents I can process?

With all the many solvents available for use and their many different brand names, it is impractical to attempt to list them all here but here are some example: alcohols, aliphatic petroleum, aromatics, esters, ketones, terpenes and compounds of lacquer thinners with boiling

temperatures from 130° F to 388 ° F, used in painting and coatings applications cleanup, are commonly processed in the Sidewinder. If you discuss your needs with your dealer or the factory you will find it is easier to tackle your individual situation.

What about chlorinated solvents?

Many users are satisfactorily processing chlorinated solvents. You should be aware, however, that this is an area where additional maintenance cost could be incurred because of potential acid and corrosion problems.

How much does it cost to do a batch?

Five to six cents an hour here locally, less than 50 cents.

How many amps? Volts?

110-120 volts, about 11amps 60 Hz, single phase. We advise using a dedicated circuit whenever possible.

Can I put it outside?

The Sidewinder is not intended for outdoor use. The Sidewinder should be in a covered area, protected from rain and direct sunlight. Operating the unit in a cold environment will result in slower processing. Operation in a hot environment could allow some of your clean solvent to evaporate. The Sidewinder is designed for use in ambient temperature from 50° F (10° C) to 95° F (35°).

Can I cook water?

The Sidewinder was designed to recycle solvents, which have different characteristics and properties than water.

What happens if I mix solvents?

The mixture you put in dirty is the blend that you will get back clean.

Is it EPA approved?

EPA is not in the business of approving or certifying any commercial equipment. They are in the business of protecting the environment by enforcing laws with heavy fines and cleanup cost to violators. They give advise to the waste generator and offer many educational publications. They do endorse "in house" recycling for dirty solvents, because this minimizes hazardous waste.

Hercules Two Gun Washer with Timer

Automatically cleans two gun / two cups in one minute and, on average, uses just 5 gallons of solvent per month; reducing solvent costs by 75 to 90 percent.

Equipped with industrial duty high-volume diaphragm pumps.

75% to 90% waste minimization Herkules Paint Gun Washers normally require five gallons of a mid to high grade solvent every four to six weeks, reducing solvent and hazardous waste disposal.

Being both enclosed and automatic, Herkules Paint Gun Washers limit not only VOC emissions but also direct skin contact with harsh cleaning solvents.

Cleans guns (siphon, gravity and pressure), accessories, cups, stirrers, filters, pressure pot (up to 2 quart capacity or 13.5" high), paint hoses and 5-gallon cans.

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ATTACHMENT 3

Equipment Information on Parts Wash Rack

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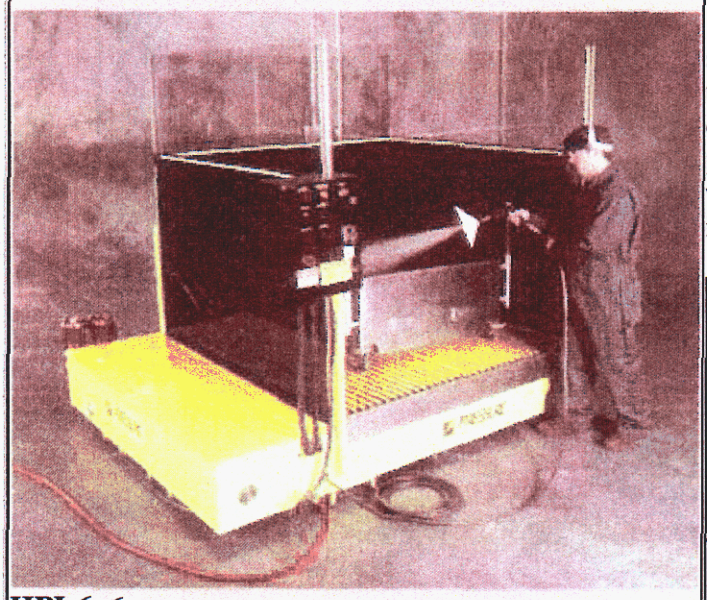
PRESSURE ISLAND
The Next Generation in Cleaning®

Heavy Duty System



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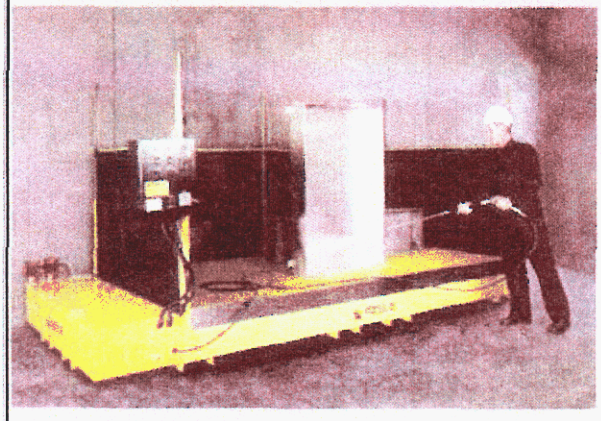
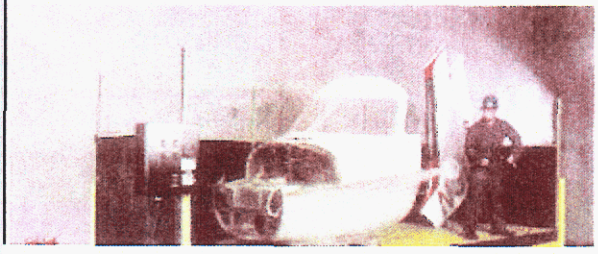
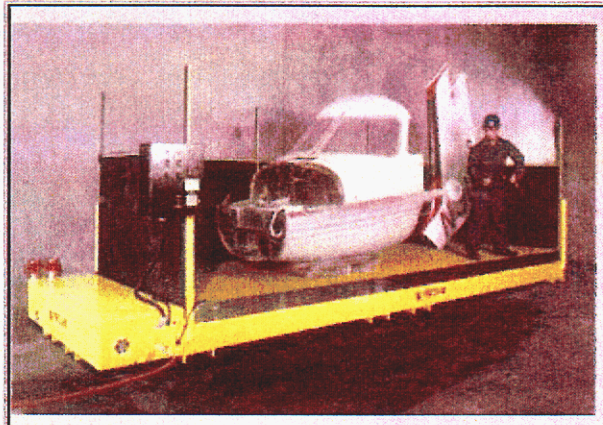


HPI-6x12



This heavy-duty system is ideal for cleaning small to medium size parts. The system eliminates time consuming hand cleaning while improving cleaning quality and efficiency. Its steel frame and powder coated finish provide a rugged construction with a durable finish including the highest quality industrial components.

Material of Construction	Steel frame and base, stainless steel tank, extruded aluminum posts, polypropylene/polycarbonate side walls
Material Finish	Powder coated
Footprint Dimensions	6 ft. wide by 6 ft. deep/12 ft. wide by 6 ft. deep/18 ft. wide by 6 ft. deep
Work Area Dimensions	6 ft. wide by 6 ft. deep/12 ft. wide by 6 ft. deep/18 ft. wide by 6 ft. deep
Wall Height	6 feet
Approximate Weight	1800 lbs./3000 lbs./4500 lbs.
Load Capacity	200 lbs. per sq. ft.
Capacity of Reservoir	100 gallons
Pumps	1000 psi diaphragm pump @ 2.2 gpm
Standard Filter	Single 10 micron 8" x 30" filter housing
Heat	Two 10-KW heaters



HPI-6x18

Floor Decking	Pultruded fiberglass
Power Requirements	480 VAC, 3- phase, 60 amps

3345 Edison Way

Menlo Park, CA 94025

Toll Free: (888) DE-GREASE (334-7327)

ATTACHMENT 4

Equipment Information on Paint Can Liners

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The Paint Dawg is a multi-liner system in a paint bucket. 24 disposable liners are pre-packed to fit snugly inside each unit. The liners pull out one at a time, leaving a clean bucket that is ready for use.

The liners are constructed of .8-mil polyethylene. They are impervious to most paints and solvents currently used in the industry. To remove left over paint from **the Paint Dawg**, simply pull the liner out, snip a corner of the bag, and squeeze paint back into the original container.

Once the bag has dried it may be disposed of in any trash receptacle. With the Paint Dawg unnecessary cleanup time is eliminated as well as conserving resources and preventing spills

3 sizes are available (each size has 24 liners)

The Paint Pup: 5 quart

The Paint Dawg: 2 gallon

The Big Dawg: 5 gallon

- Change colors fast
- Paint without access to water
- Keep a clean "5" handy at all times
- Strain paint in less than a minute
- Keep that residential re-paint tidy
- Eliminate buckets cluttering the jobsite, hard or office

Paint Dawg multi-liner buckets are the most cost effective liner-system available guaranteed to save you valuable time and money.

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Distribution:

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1		1050	Anastasia Richardson, 3124
1		9221	Laurie Farren, 8516
3		9631	Scott Keith, 8513-1
1		9631	Marion C. Armijo, 8513-1
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1		9221	Lee Gardizi, 8516
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1		9902	Robert Clevenger, 8513