

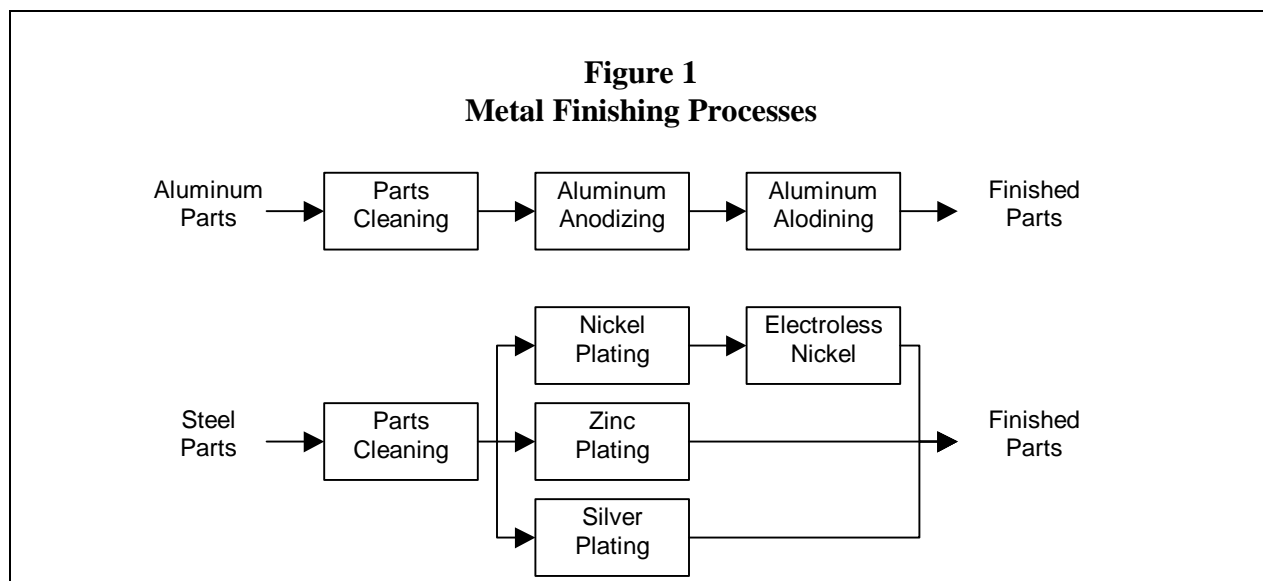
POLLUTION PREVENTION AT SPECIFIC PLATING COMPANY

Specific Plating has dramatically reduced its sewer discharges of copper and nickel. The company's pollution prevention efforts include both modifications of industrial processes and improved waste handling and treatment techniques. The Palo Alto Regional Water Quality Control Plant (RWQCP) has strongly supported and encouraged implementation of projects like those implemented by Specific Plating.

Specific Plating is a small metal finishing company that employs 6 to 8 people. At Specific Plating, parts are plated with metals such as copper, nickel, zinc, silver, and gold. Additionally, Specific Plating offers anodizing and alodining of aluminum parts. Because Specific Plating handles specialty projects, all work is performed manually and parts plated vary widely in sizes, shapes and substrate materials.

Waste-Generating Activities

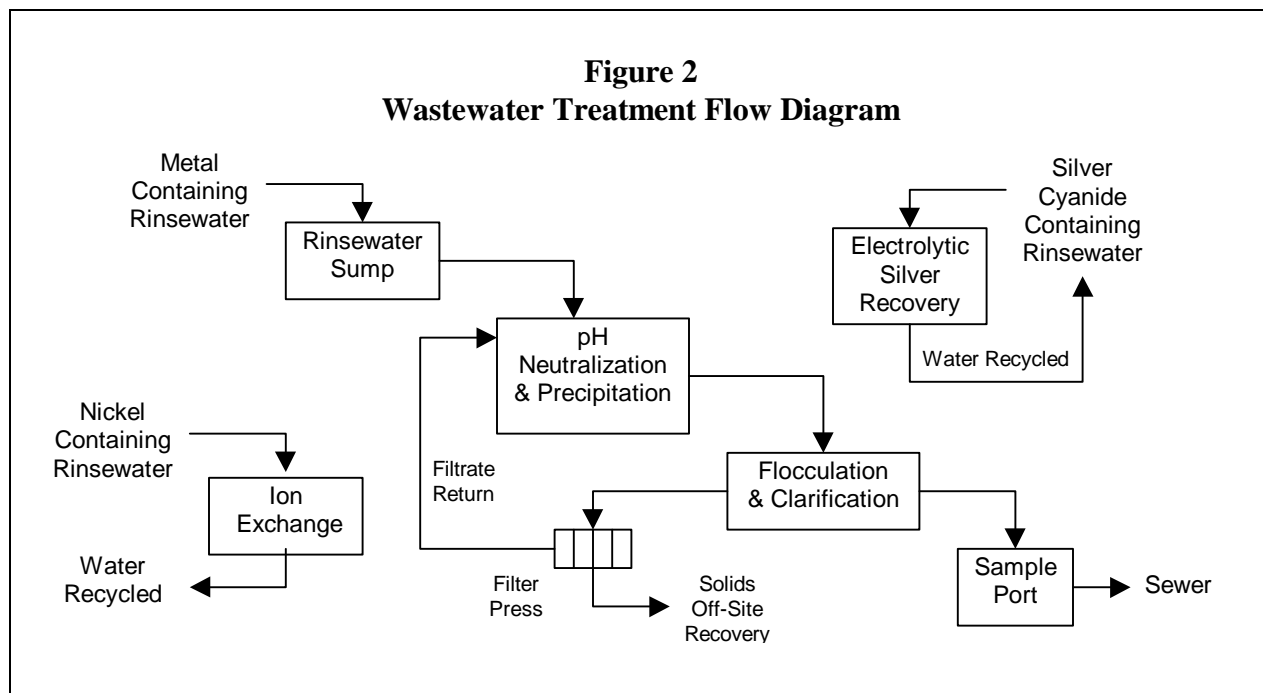
Figure 1 shows a diagram of the various plating processes at Specific Plating. During the plating process, parts are dipped into tanks which contain various process solutions. After each plating process tank there is a dragout tank followed by a rinse tank where the excess metal solutions are washed from the parts. The water in the rinse tanks must be continuously replaced and, therefore, metal containing wastewater is generated.



In addition to rinse waters, spent process baths are also a source of waste generation. As contaminants build up in the baths, they become unusable and must be replaced.

Wastewater Treatment

The spent baths and rinse water are treated on site to remove metals. Metals are separated by chemical precipitation followed by settling. The settled metal sludge is then filtered to remove excess water, and is shipped off site for recycling. The treated water, which contains relatively small amounts of metals, is discharged to the sewer. Figure 2 shows a flow diagram of Specific Plating's treatment process.



Pollution Prevention Projects

The RWQCP is asking companies to reduce metals discharges in their wastewater so that the treatment plant's discharge of metals to the San Francisco Bay can in turn be reduced. Implementing measures that reduce waste and sewer discharge is often cost effective.

Specific Plating has an ongoing waste reduction program that has reduced use of metal-containing solutions and has dramatically reduced metals discharges to the sewer. Many projects have been installed with effective results.

These projects include:

- Conversion to deionized water for bath make-up and rinsing;
- Installation of process control measures to minimize water use and baths solution waste such as:
 - drag-out rinse tanks to capture metals and allow their reuse,
 - fog spray rinses that effectively remove metals from parts with less water,
 - return of fog rinse water to drag-out tanks,
 - flow restrictors to minimize water usage,
 - drip bars to allow parts to be hung for additional draining,
- Installation of a system to recycle deionized rinse water at spray rinses through ion exchange,
- Addition of process tank conductivity controllers to minimize make-up water and chemical use, and
- Installation of an electrolytic recovery unit to capture metals from dragout.

Each of these projects involved installation of equipment or changes in operating procedures. Making these changes resulted in reduced materials and water use, reducing company operating costs. Table 1 shows the investment and payback for Specific Plating's major pollution prevention projects completed to date.

Table 1
Cost/Savings Analysis for Specific Plating Pollution Prevention Projects

<u>Project</u>	<u>Installed Cost</u>	<u>Annual Savings</u>	<u>Payback (Years)</u>
DI Make-Up Water	\$2,000	\$1,200	1.7
Process Control Measures	\$24,000	\$11,000	2.2
Rinse Station Water Recycling	\$16,500	\$11,000	1.5
Process Conductivity Controllers	\$15,000	\$5,100	2.9
Electrolytic Recovery Unit	\$5,000	\$1,700	2.9

Specific Plating also made several other changes for which detailed financial information is not available. These include:

- reformulation of the cleaner bath to allow it to be recycled and to provide more efficient cleaning;
- remodeling the plating areas to provide improved process flow and minimize the potential for bath contamination; and
- improved wastewater treatment chemistry for better removal of metals from the treated water.

Wastewater Metals Discharge

Table 2 shows a comparison of Specific Plating's discharge and disposal data before and after completion of pollution prevention projects. Specific Plating currently discharges about 2,200 gallons per day of treated wastewater to the RWQCP. The discharge contains about 0.0008 pounds per day of copper and about 0.004 pounds per day of nickel. Compared to previous years this is a reduction of approximately 88% for copper discharges and 85% for nickel discharges. Wastewater discharge flow has been reduced 27% and off-site sludge disposal has been reduced 53%.

Table 2
Discharge/Disposal Changes

Item	Discharge/Disposal		% Reduction
	Before Projects	After Projects	
Copper	0.005 lbs/day	0.0006 lbs/day	88%
Nickel	0.02 lbs/day	0.003 lbs/day	85%
Flow	3,000 gpd	2,200 gpd	27%
Sludge Disposal	14,800 lbs/yr	7,000 lbs/yr	53%

References

Ed Williams, Specific Plating Company, 936 Industrial Avenue, Palo Alto, CA 94303, (415) 494-6995.

Barron, Thomas S. and Jim Miille, *Reasonable Control Measures for Copper & Nickel Discharges of Circuit Board & Metal Finishing Firms*, prepared for the City of Palo Alto Regional Water Quality Control Plant, March, 1994, approx. 100 pages.

Barron, Thomas S., Jim Miille and Patrick Burt, *Hazardous Waste Minimization Checklist & Assessment Manual for the Metal Finishing Industry*, third edition, California EPA, DTSC, October, 1993, 154 pages.

Barwick, Kathryn, *Fact Sheet: Printed Circuit Board Manufacturers*, California EPA, DTSC, August, 1989, 4 pages.

Barwick, Kathryn, *Fact Sheet: Waste Reduction for Metal Finishers*, California EPA, DTSC, April, 1990, 4 pages.

U.S. Environmental Protection Agency, *Guides To Pollution Prevention: The Fabricated Metal Products Industry*, EPA/625/7-90-006, July, 1990, 76 pages.