

NEVADA SMALL BUSINESS DEVELOPMENT CENTER BUSINESS ENVIRONMENTAL PROGRAM

CS-FY9501019

SOLVENT RECYCLING AT RMAX

Waste Reduction Case Study

PROJECT

RMAX, a 24 employee manufacturing firm located in Fernley, received grant funding from the Nevada Division of Environmental Protection (NDEP) to install a solvent recycler. With the purchased equipment, RMAX recovers spent solvents generated from their parts cleaning operations; this spent solvent was previously disposed of off-site.

BACKGROUND

RMAX is a manufacturer of foam insulation. Most of the waste solvents used for cleaning parts from their equipment maintenance are managed as hazardous waste due to their hazardous constituents. Typically, these solvents contain hazardous constituents such as xylene, Methyl Ethyl Ketone (MEK), acetone and other F listed solvents (40 CFR 261.31). Many naphtha based solvents are considered hazardous waste when spent due to their flash point. Under the State and Federal regulations, solvents used in degreasing operations containing more than a 10% cumulative concentration of some F listed solvents are considered hazardous waste when they are spent. Also, solvents with a flash point of less than 140 degrees Fahrenheit are considered hazardous waste when spent.

RMAX uses three different solvents, all are naphtha and ethylene glycol based. Many businesses contract with an outside management company to haul waste off-site for recycling. Generally, it is expensive to haul and handle waste that is considered a hazardous waste. One alternative is to recycle these solvents on-site through a distillation unit. This not only reduces the cost of disposal dramatically, but also saves the business on the cost of virgin solvent purchases. There are various technologies and equipment available in the market to reclaim solvents. The most popular technology is the use of a solvent still or a distiller. In the past, RMAX was generating 60 gallons per year total of all three solvent wastes; the waste was handled by a waste management firm.

TECHNOLOGY

RMAX installed a *Recyclit Model SR80* vacuum solvent recovery system manufactured by Lenan Corporation. Waste solvent is added to a 8 gallon capacity enclosed metal chamber. The still operates by vaporizing the solvent and leaving the contaminants behind in a sludge called still-bottoms. The vaporized solvent condenses on a refrigerated heat exchanger and is captured in another bucket as reclaimed solvent. The reclaimer can run from 1 to 8 gallons in a batch and shuts off when the solvent is reclaimed. The still can recover up to 95 percent of the spent solvent. Some solvents are recovered in about 5 hours and other solvent require between 10 to 24 hours or more to be recovered, depending upon their boiling point. Lenan Corporation, the manufacturer of the Recyclit machine, claims the system is safe to recycle low flash point naphtha based mineral solvents also.

COST SAVINGS

Prior to recycling on-site, RMAX generated about 60 gallons of waste solvent per year and spent \$300 per year in hazardous waste disposal costs. RMAX now generates about 0.5 gallons of still bottoms a month, which is currently being accumulated for disposal. If F-listed solvents are reclaimed, the still bottoms are considered a hazardous waste and must be managed as a hazardous waste. On the other hand, still bottoms generated during reclaiming any other solvent need to be tested under the Toxicity Characteristics Leachate Procedure (TCLP) and handled appropriately. If the TCLP test results indicate the still bottoms to be non-hazardous and the flashpoint is 140° F or above, they can be handled as a non-hazardous solid waste.

Installation of the recycler has not only eliminated the need to dispose of spent solvents, but has also reduced the cost associated with purchasing fresh solvent. RMAX was purchasing one 55 gallon drum a year of each solvent at an average cost of \$445 per drum. RMAX has eliminated the purchase of these solvents thus saving them \$1,335 a year. In the future, it is anticipated RMAX will need to purchase make-up solvent since some solvent is lost through use and recycling.

"Despite the setbacks due to faulty equipment from the vendor to start with, the still has saved us money on solvent purchase and waste management costs," says Jon Pyles, Engineer at RMAX.



This case study was developed by the Business Environmental Program of the Nevada Small Business Development Center with funding provided by the Nevada Division of Environmental Protection.



The cost associated with installation of the solvent reclaimer system was \$2,350. NDEP provided half the amount in grant money. RMAX is saving approximately \$300 a year on waste disposal costs by installing the recycler. **With a total savings of \$1,665, it will take RMAX about 1.5 years to break even on the equipment costs.** Each subsequent year, RMAX will save an additional \$1,665 in avoided waste management and material purchase costs.

COMMENTS

"Despite the setbacks due to faulty equipment from the vendor to start with, the still has saved us money on solvent purchase and waste management costs," says Jon Pyles, Engineer at RMAX, "and we have reduced the amount of waste we generate drastically." The equipment originally shipped to RMAX had a faulty seal and the vapor leaked through the can lid. The process can was replaced and later the lid was replaced as the problem persisted. After replacing the can and the lid, the solvent was successfully reclaimed.

Cost savings may vary from one shop to another depending upon the solvent used, equipment purchased and waste management practices. There are various technologies and equipment available in the market to reclaim solvents. The most popular technology is the use of a solvent distillation unit. The solvent distillation units are available in various batch sizes and can be purchased based on the amount of spent solvent generated at a shop. When purchasing and installing a solvent distillation unit be sure to use UL approved equipment and check with your local fire department for installation requirements. Congratulations RMAX; Charlie Chai / Jon Pyles with RMAX can be reached at (702) 575-4849.

SOLVENT RECYCLING EQUIPMENT VENDORS

Lenan Corporation (Recyclit) (608) 752-1601
Purastill (419) 536-7384
Solvent Recovery Systems Inc. (904) 264-3651
Clean Streams, Inc. (413) 732-4186
Pope Scientific, Inc. (414) 251-9300
Pure-Flo International (713) 675-3801
Solvent Kleene, Inc. (508) 531-2279
Distil Kleen (201) 217-0505
Brighton Custom Fabricating Div. (513) 771-2400
Progressive Recovery Inc. (618) 281-7196
B/R Instrument Corp. 9410) 820-8800
Binks Manufacturing Company (708) 671-3000
Gardner Machinery Corporation (704) 372-3890
Hydro-Tek (815) 469-3585
Westport Environmental Systems (508) 636-8811
Finish Thompson Inc. (814) 455-4478

Automotive of Nevada (702) 791-0177
Re-Neva Auto Paint & Supply (702) 331-2866
Waste Recovery Designed Products, Inc. (412) 257-3256
Max Daetwyler Corporation (704) 875-1200
Prisco (212) 962-6565
Vaco-Salv Chicago, Inc. (708) 381-4079
Recycling Systems of America, Inc. (603) 430-9343
Chemical Management Technology, Inc. (904) 247-3247
Ecology Equipment, Inc. (412) 341-7190
Branson Ultrasonics Corporation (203) 796-0400
Enders Process Equipment Corp. (708) 469-3796
SIVA (904) 237-1200
PBR Industries (516) 422-0057
Giant Industries (419) 531-4600
Chinook Rings (503) 641-2411
Solvent Recovery Systems Inc. (713) 449-8871

Note: The above listing of vendors and manufacturers is provided for informational purposes only. This list is provided as a service to Nevada businesses in order to assist them with waste minimization. This listing of businesses is not to be construed as an actual or implied endorsement of their products or services. Additionally, other business which provide similar products and services may not be listed; this omission is not to be construed as an actual or implied denouncement of those businesses.