The California Department of Health Services goal to reduce incinerable hazardous waste, by over 50% statewide, provided the impetus for the development of an on-site system for treatment and recycling of solvent contaminated solid waste.

The urgent need to reduce incinerable hazardous waste has been created by the lack of treatment capacity for this type of waste within California.

Industries such as aerospace, printing, semiconductors, paint manufacturers, petroleum refiners, and a host of others, generate large quantities of solvent contaminated hazardous waste. This waste is typically composed of rags, wipes, gloves and other solid material used in production, assembly and manufacturing areas. Contaminants include RCRA F001-F005 solvents such as methyl ethyl ketone, acetone, isopropyl alcohol and many others.

As the final third of the land ban regulations have now been implemented, this material can be disposed of properly only by incineration at out of state facilities. The cost to do this ranges between $400 to $700 per 55 gallon drum weighing about 300 pounds. A significant portion of this expense is in transportation costs.

Based on the preceding information, it seemed that this type of waste could be treated, and possibly recycled on-site, if the equipment needed to perform this function could be located. Financial and environmental factors demanded it.

Recycling will reduce the hazardous waste disposal costs, as well as material repurchase costs! The rags alone cost between $2.00 to $3.00 per pound. The environmental benefits are obvious.
The treatment procedure necessary to render the materials non-hazardous and suitable for recycling on-site or for disposal as non-hazardous solid waste would have to begin with a solvent extraction process. Cleaning the material without first removing the solvents could result in damage to certain components of the cleaning equipment and unnecessary contamination of the cleaning fluid. Since much of this material is contaminated with highly flammable Class I solvents, the solvent extraction process would have to be performed in a specially retrofitted, explosion proof drying unit. Locating this equipment became more difficult than originally anticipated. A recovery unit, specifically designed for this purpose, is not readily manufactured.

At this point, I enlisted the help and support of Mr. Jerry Kolodzik of the SPACE AGE TECHNOLOGY COMPANY to research the availability of equipment capable of safely extracting Class I and other solvents. Working in conjunction with the Hoyt Corporation, Mr. Kolodzik was able to help design a specially retrofitted solvent reclaimer - the S.A.T. Solvent Recovery Unit.

The Hoyt Corporation is an international company, based in Boston, that specializes in the manufacture of hazardous waste reclamation equipment. In their fifty year history, they have developed a fine reputation world wide and are leaders in the field of solvent recovery.

The S.A.T. Solvent Recovery Unit has been tested, and approved as explosion proof, and is equipped with a special sensor, in the outlet port, that indicates when all solvent has been removed from the contaminated waste. The Solvent Recovery Unit will shut off automatically, only when the sensor indicates that no more solvent is present in the air stream.

If solvents are the only hazardous contaminant present, the solid waste may be rendered non-hazardous at this point in the process if testing, by a state certified laboratory, indicates that the material no longer meets the criteria for hazardous waste outlined in Article 11, Title 22 of the California Code of Regulations.
However, if the waste is contaminated with other hazardous components such as oil or grease, and/or it is to be reused on-site, the material must be cleaned and further decontaminated in the S.A.T. Recycle Unit.

This phase of the process removes any residual dirt, oil, and grease and renders the material suitable for reuse on-site. It is important to note that the material does not have to be reused on-site at the same point where it was originally generated.

As indicated in the attached correspondence with the Department of Health Services, the S.A.T. Solvent Recovery and Recycling Systems have been approved as a recycling process. As a recycling process, a treatment variance would not be required if the process is used as illustrated in Diagram A.

If only a portion, i.e. rags, or none of the waste is to be recycled on-site, then the cleaning of any other portion, prior to disposal as non-hazardous solid waste, would be considered treatment of a hazardous waste and require a treatment variance be obtained from the Department of Health Services. This is depicted in Diagram B.

As shown in Diagram C, this variance requirement can be avoided if the material to be recycled is segregated at the point of generation. Then, the material to be reused on-site would be the only portion of the waste stream treated.

The S.A.T. Solvent Recovery and Recycling System is environmentally, and economically, a sound investment. The payback period for the typical company is usually less than one year. To find out more about this waste treatment and recycling procedure please contact Mr. Jerry Kolodzik at 415/592-2552 or Mr. Del Kreps at 714/982-3432.
RECYCLING PROCESS—NO VARIANCE REQUIRED

Solvent contaminated rags, wipes and gloves

S.A.T. Solvent Recovery Unit

S.A.T Recycle Unit

Rags, wipes and gloves recycled on-site. Solvent disposed of as hazardous waste.

Solvent recycled on-site. Rags, wipes and gloves disposed of as non-hazardous solid waste.

Rags, wipes and gloves, and reclaimed solvent recycled on-site.

No DOHS Variance Required

DIAGRAM A
PORTION OF WASTE STREAM RECYCLED - VARIANCE REQUIRED

Solvent contaminated rags, wipes and gloves

S.A.T. Solvent Recovery Unit

S.A.T Recycle Unit

Portion of solid waste (e.g., rags) recycled on-site. Remainder disposed of as non-hazardous waste. Solvent disposed of as hazardous waste.

Rags, wipes and gloves disposed of as non-hazardous solid waste. Solvent disposed of as hazardous waste.

DOHS Variance Required

DIAGRAM B
PORTION OF WASTE STREAM RECYCLED

- NO VARIANCE REQUIRED

Solvent contaminated rags, wipes and gloves

Waste segregated at point of generation

Rags

Wipes & Gloves

Disposed of as hazardous waste

S.A.T. Solvent Recovery Unit

S.A.T Recycle Unit

Rags recycled on-site. Solvent disposed of as hazardous waste.
Solvent recycled on-site. Rags disposed of as non-hazardous solid waste.
Solvent and rags recycled on-site.

No DOHS Variance Required

DIAGRAM C
August 1, 1990

Mr. Bob McCormick
Department of Health Services
714/744 P Street
Sacramento, CA 94234-7320

Dear Mr. McCormick:

I understand that the Department of Health Services has recently focused its attention on a 50% reduction in the quantity of solid hazardous waste produced statewide. Within Santa Clara County alone, there are many semiconductor manufacturers that produce huge quantities of solvent contaminated solid waste (i.e., rags, wipes and gloves). These rags, wipes and gloves are generated in fab areas and are contaminated with small amounts of solvents such as xylene, acetone, IPA (F001-F005 solvents). This solid waste stream could be treated and recycled on-site using the following equipment and procedures:

1. The solvent contaminated solid waste would be placed in a specially designed explosion proof dryer for a period of time necessary to volatilize all the solvents.

2. Solvent emissions from the dryer would be directly vented into a solvent distillation unit and all solvent would be recaptured.

3. The recaptured solvent could be reused on-site or disposed of as hazardous waste. The decontaminated gloves could be subsequently washed and reused on-site and the wipes disposed of as non-hazardous solid waste.

Please review this described procedure and provide me with your comments. If this procedure is adhered to and a portion of the waste stream recycled on-site (i.e., gloves or reclaimed solvent), would the facility still be required to obtain a treatment variance or comply with permit by rule?

Thank you for your help in resolving this matter.

Sincerely,

Sherry Catania, R.E.H.S.
HAZARDOUS MATERIALS SPECIALIST
Ms. Sherry Catania  
County of Santa Clara  
Health Department  
2220 Moorpark Avenue  
San Jose, CA 95128  

RECYCLING OF CONTAMINATED RAGS, WIPES AND GLOVES

Dear Ms. Catania:

This is in response to your recent letter describing a procedure to recycle gloves and/or reclaimed solvent from a waste stream of contaminated rags, wipes and gloves. The rags, wipes and gloves, contaminated with EPA listed wastes F001 through F005, would be placed in a dryer where the solvents would be volatilized and captured. The gloves would be washed and reused. In a subsequent telephone conversation you also indicated that the wipes and other material could be used as substitute for vermiculite in lab packs.

If the waste being recycled is the reclaimed solvent, the "cleaned" wipes, rags and gloves would be considered as a residue of the recycling operation. The recycling process itself would not require a treatment permit, pursuant to subsection 25143.2(c)(2) of the California Health and Safety Code (HSC). This section exempts facilities from permit requirements if they are recycling and using a waste stream on-site, as long as hazardous waste generator requirements are observed, including the 90 day storage limit. (If the solvents were a non-RCRA waste, they would not be classified as a waste at all if recycled on-site. Therefore the 90 day limit would not apply.) The residual rags, wipes and gloves would have to be handled as a hazardous waste if they still meet the criteria of Article 11, Title 22, California Code of Regulations. In addition, if the wipes and rags are to be used in lab packs, regulations specify that packing material for lab packs "shall not be capable of reacting dangerously with, being decomposed by, or being ignited by the contents of the inside containers".

If the waste being recycled is only the gloves or only, the wipes, cleaning of any other waste stream, prior to disposal, would be considered treatment of a hazardous waste and subject to permit requirements. The California Department of Health Services does want to encourage legitimate recycling, however the generator must always demonstrate that something is being recycled and the activity meets all requirements of the exemption. Waste treatment will still need a permit or come under the permit by rule provisions of Section 66392, Title 22, of the California Code of Regulations (CCR).
All of the exemptions under Section 25143.2, HSC, are restricted by the provisions of subsection 25143.2(e). Although I do not see how any of these provisions would apply to the situation you described, a generator should always review them. Also, the generator should be aware of the information and documentation requirements of subsection 25143.2(f), HSC, to support a claim to an exemption.

If we can be of any further assistance, please contact Jessie Schnell of my staff at (916) 322-1003.

Sincerely,

Robert McCormick
Alternative Technology Division
Toxic Substances Control Program

cc: Howard Hatayama, Regional Administrator
    Region 2 / BERKELEY
    Toxic Substances Control Program
    700 Heinz Avenue, Bld. F
    Berkeley, CA 94710

RM:JS/db
Note: recovery room ceiling 2-Hr construction not less than 11'-0" A.F.F.