Institute for Research and Technical Assistance

The Alternative

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CARB and SCAQMD Plan to Regulate Paint and Lacquer Thinner

Two agencies, the California Air Resources Board (CARB) and the South Coast Air Quality Management District (SCAQMD), have indicated they will regulate the VOC content of consumer product paint thinners and multi-purpose solvents. Emissions from the products amount to about 14 tons per day statewide and 6.3 tons per day in the South Coast Basin. Although CARB is the agency with jurisdiction over consumer product regulations, SCAQMD wants to move forward more quickly because consumer products are projected to be the highest VOC emitting category in the South Coast Basin by 2014. SCAQMD has already regulated stationary sources and must reduce their VOC emissions further to achieve attainment.

CARB established a workgroup for the paint thinners and multi-purpose solvents and held the first meeting in August. The agency plans to develop a regulation which will be heard by the Board in June 2009. At the workgroup meeting, CARB asked for information on thinning or cleanup applications that could not be done with low-VOC materials.

SCAQMD has also established a workgroup for the thinners and mult-purpose solvents and the first workgroup meeting was held in July. The District has indicated that they may establish a limit of 25 grams per liter VOC for the materials. The SCAQMD regulation would require manufacturers to obtain an ID number and to register all products by February 1, 2009. Suppliers would also have to maintain records of production, distribution and sales. The District indicates that their Board would hear the regulation in December of this year.

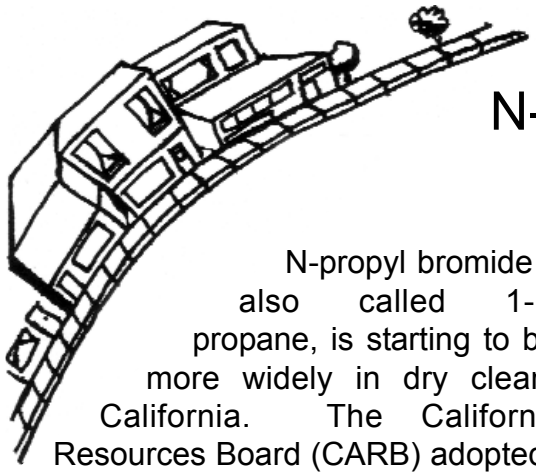
SCAQMD adopted a regulation for the VOC content of cleanup materials of 25 grams per liter several years ago. This regulation was based on projects IRTA completed with EPA and SCAQMD. IRTA worked with industrial facilities that have coating operations in several different applications and demonstrated that 25 gram per liter formulations could be used in all cases. Industrial facilities in the South Coast Basin have been using compliant cleaning formulations for a few years.

Thinners have not yet been regulated in the South Coast Basin. IRTA recently completed a project sponsored by Cal/EPA's Department of Toxic Substances Control (DTSC) that involved identifying, developing, testing and demonstrating low-VOC, low toxicity alternative consumer product cleanup materials and thinners. IRTA found effective alternatives for many different types of coatings. The alternatives were based on acetone and acetone blends with soy and a propylene glycol ether. These alternatives met the 25 gram per liter limit being proposed by SCAQMD. A report summarizing the results of the research and demonstration project is on IRTA's website at www.irta.us.

For more information on safer alternative thinners and cleanup materials, call Katy Wolf at IRTA at (818) 244-0300.

Small Business Corner

N-Propyl Bromide Being Marketed and Used in Dry Cleaning



N-propyl bromide (NPB), also called 1-bromopropane, is starting to be used more widely in dry cleaning in California. The California Air Resources Board (CARB) adopted a regulation to phase out the use of perchloroethylene (PERC) in dry cleaning in the state by 2023. PERC is a carcinogen, a Toxic Air Contaminant (TAC) and is listed on Proposition 65. PERC has contaminated many dry cleaning sites and, in some cases, has made its way to the groundwater.

NPB is being marketed under the tradename DrySolv. The company's literature describes NPB as "a non-hazardous, environmentally friendly, direct replacement cleaner for PERC that will work in your existing machine." It also states that the solvent is "non-chlorinated, non-flammable, non-hazardous and is environmentally safe."

NPB is a reproductive toxin that also causes nerve damage. According to a Health Hazard Alert prepared by the Hazard Evaluation System & Information Service (HESIS), it causes sterility in both male and female test animals and harms the developing fetus when tested in pregnant animals. It can cause weakness, pain, numbness and paralysis. NPB is listed on Proposition 65.

The Sacramento Metropolitan Air Quality Management District recently issued a permit to construct to a dry cleaning facility, Swansons Cleaners, in Sacramento. The facility has two PERC machines and, according to the air district evaluation, the shop plans to convert one machine to NPB. The dry cleaning machine that will use the NPB is a machine with only primary control which has a refrigerated condenser. The air district evaluation indicates that the solvent is a neurotoxicant and reproductive toxicant and is listed under Proposition 65 as a reprductive toxicant. It also states that Swansons Cleaners is located within 1,000 feet of two K-12 schools, Merryhill Millcreek Elementary School and the Childtime Learning Center. The permit indicates that there are no notification requirements since NPB is not listed by CARB as a Toxic Air Contaminant.

Local air districts in California have no choice in granting permits to dry cleaners who wish to use NPB in dry cleaning. Since the chemical is not a listed Toxic Air Contaminant, they cannot forbid its use or even require notification to the surrounding community including schools. This points to the problem of emerging chemicals that are used in applications even though they have serious and known toxicity problems. Other California air districts may grant permits to dry cleaners who wish to convert to NPB over the next few years and it could become a widely used alternative to PERC. Since the chemical is not a Toxic Air Contaminant, it can be used with few controls.

NPB has another problem that makes it risky to use in dry cleaning. The chemical is unstable to hydrolysis and contains a stabilizer which is designed to scavenge water. There is a substantial amount of water in the dry cleaning process. Water comes in on the clothing, it may be present in the detergent and water is condensed from the atmosphere in the cleaning machine when the

(see **N-Propyl Bromide** *page 3)*

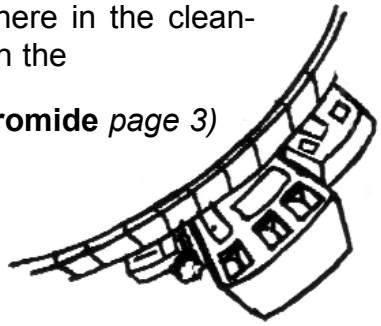


Illustration by Todd Schmid

BAAQMD Proposes Regulation on Printing Cleanup

The Bay Area Air Quality Management District (BAAQMD) is amending their Regulation 8, Rule 20 "Graphic Arts Printing and Coating Operations." The regulation establishes VOC limits for inks, coatings, adhesives, cleaning products and fountain solutions. The District estimates that the VOC emissions from cleanup solvents from graphic arts sources are 3.2 tons per day. Cleanup solvent emissions from lithographic printing amount to 3.02 tons per day and emissions from screen printing are 0.09 tons per day.

For hand cleaning products in lithographic printing and for screen printing cleanup materials, the District is proposing VOC limits of 500 grams per liter by January 2009 and 100 grams per liter by January 2010. For lithographic printing automated cleaning products, the 2009 limit is higher, at 650 grams per liter; the limit is 100 grams per liter by the final compliance date of January 2010.

Over the last several years, IRTA conducted projects sponsored by EPA, Cal/EPA's Department of Toxic Substances Control and the South Coast Air Quality Management District (SCAQMD) to identfy, develop, test and demonstrate low-VOC, low toxicity alternative cleanup materials for lithographic and screen printing. IRTA developed, tested and demonstrated alternatives based on soy cleaners, water-based cleaners and acetone. Acetone is not classified as a VOC and it is lower in toxicity than most other organic solvents.

IRTA worked with lithographic and screen printers in the South Coast Basin to demonstrate the safer alternatives. Based on IRTA's work, SCAQMD adopted new regulations that specified lower VOC limits for the printing cleanup solvents in Rule 1171 "Solvent Cleaning Operations." The VOC limits of 100 grams per liter for the alternative cleanup materials became effective in the SCAQMD jurisdiction on January 1, 2008.

The final VOC limits proposed by the Bay Area air district are the same as the SCAQMD limits in Rule 1171. The Bay Area is proposing to reduce the limits in two phases. The interim limit would be set for 2009 and the final 100 gram per liter VOC limit would be set for 2010. The Bay Area staff indicates that this approach will provide cleaning product suppliers time to refine formulations and expand production. The printing industry will also have time to become familiar with the alternative low-VOC products.

The BAAQMD plans to adopt the regulation in the fall of 2008. For questions or comments on the proposed regulation, contact Will Saltz at (415) 749-4698.

For questions on the low-VOC, low toxicity alternatives, contact Katy Wolf at IRTA at (818) 244-0300.

N-Propyl Bromide

(Continued from Page 2)

refrigerated condenser is operating. If the stabilizer in the NPB is used up, the NPB will "go acid." This means that hydrobromic acid will be formed and it could corrode the machine and the garments would be damaged. Hydrobromic acid is also dangerous for workers to breathe. NPB has "gone acid" many times in vapor degreasing applications and there is reason to expect that it will do the same in dry cleaning.

Dry cleaners use spotting chemicals before and/or after the major dry cleaning process. The primary spotting chemicals used today are PERC and trichloroethylene (TCE), which, like PERC, is a carcinogen. There are other spotting chemicals that do not pose toxicity problems and IRTA has tested water-based and soy based alternatives extensively. DrySolv has started marketing NPB in aerosol cans as a spotting agent. It would be dangerous for workers in dry cleaning facilities to use the chemical since exposure in spotting is high.

For information on NPB and the alternatives in dry cleaning and spotting, contact Katy Wolf at IRTA at (818) 244-0300.

IRTA Initiates Greenhouse Gas Project

IRTA recently started work on a project to investigate use and emission characteristics of certain chemicals that contribute to global warming. The project, sponsored by the California Air Resources Board (CARB), is part of a program initiated as a result of an assembly bill. Under AB 32, CARB is charged with adopting methods of reducing greenhouse gas (GHG) emissions to 1990 levels by 2020. As part of that work, CARB is developing emissions inventories of various GHGs.

Carbon dioxide is the major GHG. IRTA's project involves focusing on applications that emit GHGs that have high global warming potential (GWP) compared with that of carbon dioxide. Some of the chemicals used in these applications also contribute to stratospheric ozone depletion because they contain chlorine and bromine.

IRTA will focus on Halon 1211 and Halon 1301 which are used in portable fire extinguishers and total flooding systems as fire suppressants. Although production of Halons was banned several years ago because they contribute to ozone depletion, the chemicals are still used and recycled today. In addition to a high ozone depletion potential, the Halons are very strong GHGs. The GWPs of Halon 1211 and Halon 1301 are 1,300 and 6,900 respectively compared with a GWP for carbon dioxide of 1. Alternatives to the Halons in fire suppression applications are also being used. These include various hydrofluorocarbons (HFCs) and two perfluorocarbons (PFCs) with GWPs ranging from 1,300 to 11,700.

IRTA is also addressing the use of sulfur hexafluoride in electric power transmission and distribution. Sulfur hexafluoride is a very potent GHG, with a GWP of 23,900. The chemical is used as an insulating gas in substations, as an insulating and cooling medium in transformers and as an insulating and arc quenching medium in switchgear for high and medium voltage applications. The sulfur hexafluoride is used in closed systems and very little is emitted.

IRTA is also addressing the use of GHGs in solvent applications. Production of HCFC-141b, an ozone depleting substance, was banned some years ago. Inventory of the chemical still remains and it is used for cleaning of various types. The chemical is also a GHG with a GWP of 700. HCFC-225, also an ozone depleting substance, is used in a variety of cleaning applications. One of the HCFC-225 isomers has a GWP of 180 and the other a GWP of 620. A few HFCs and hydrofluoroethers (HFEs) are used in cleaning applications. These include HFC-43-10mee which has a GWP of 1,500 and HFE-7100 which has a GWP of 390. Some companies may also have stockpiles of 1,1,1-trichloroethane (TCA) and CFC-113 which are ozone depleting substances. Their production was banned in 1996. CFC-113 has a GWP of 6,000 and TCA has a GWP of 140.

IRTA is also examining various other applications of GHGs. One such application is the use of an HFE and a PFC in a dry cleaning process called Pure Dry. This process uses a hydrocarbon as the main garment cleaning solvent. Small amounts of an HFE and a PFC are added to the hydrocarbon to increase the flash point and to enhance drying. Since the process includes distillation and the HFE and PFC are very volatile, they are likely emitted during the distillation cycle. Several dry cleaners in California have converted from perchloroethylene (PERC), the major dry cleaning solvent, to this process.

IRTA's research will involve estimating emissions of the chemicals in a base year and projecting emissions to 2020. It will also include examining alternative methods of handling the chemicals and alternatives that might be used in their place. Because all the chemicals in question have very high relative GWPs, methods of lowering emissions can lead to significant overall GHG emission reductions.

For information on the applications or the project, call Katy Wolf at IRTA at (818)

Visit our website: www.irta.us
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and recently completed reports.

SCAQMD Begins Regulation on Lubricants and Rust Inhibitors

The South Coast Air Quality Management District (SCAQMD) is developing a regulation that will restrict the VOC content of lubricants, rust inhibitors and vanishing oils. The District held workgroup meetings of interested parties on May 7 and August 19 and a public workshop on September 23. The District's Air Quality Management Plan (AQMP) calls for a control measure to be developed for lubricants.

The SCAQMD conducted a survey of lubricant distributors in the South Coast Basin. The surveyed facilities sold 4.2 million gallons of products in a year. Based on national sales data, the total volume of materials sold in the South Coast Basin could be as high as 8.1 million gallons, according to the District. The VOC emissions inventory from the survey may be more than 4.3 tons per day.

One of the issues being resolved during the regulatory development is the VOC content of lubricants. In general, the majority of the products sold list the VOC content as "zero" or "not determined." The District lab has analyzed the VOC content of a number of different lubricants, rust inhibitors and vanishing oils. The traditional method for testing the VOC content of mixtures is EPA Method 24, which was really designed to measure the VOC content of coatings. Over the last several years, as water-based cleaners and low vapor pressure cleaners like vegetable oils have been used increasingly, the District has found that EPA method 24 is not appropriate and gives spurious results for these types of products. A different method, Method 313, is the best method for measuring the VOC content of these materials. The industry is concerned that there are not enough labs familiar with this method to test the lubricant VOC content if a regulation is put in place.

Over the last several years, IRTA conducted two projects that focused on identifying, developing, testing and demonstrating alternative low-VOC lubricants and rust inhibitors. One project, which addressed lubricant alternatives, was sponsored by EPA. The other project, sponsored by EPA and SCAQMD, examined rust inhibitor and vanishing oil alternatives. Most of the companies IRTA worked with during the EPA project decided to convert to the alternatives that were tested. IRTA found low-VOC alternatives for all the companies participating in the EPA/SCAQMD project on rust inhibitors and vanishing oils. Alternatives were generally water-based or vegetable based products. In both projects, the alternatives were found to be viable and cost effective. SCAQMD staff has cited many of the IRTA case studies in their workgroup meetings. The report that summarizes all of the case studies from both projects is on IRTA's website at www.irta.us.

The District is proposing a VOC limit of 25 grams per liter for lubricants and rust inhibitors in the new regulation, Rule 1144 "Lubricants and Rust Inhibitors." The proposal would require containers to include the VOC content information and would include a prohibition of sale with a one year sell through provision. Suppliers are concerned about the labelling and prohibition of sale requirements because of the confusion over the appropriate test method for measuring the VOC content of the products. The proposed regulation would result in a VOC reduction of between 3.1 and 6.3 tons per day. The District is planning to hold a Board hearing on the rule in December.

The SCAQMD regulation would not apply to products subject to the California Air Resources Board (CARB) consumer products regulations. WD 40 is one of the products used widely by consumers and the regulation would not apply in this case. However, many facilities that have machine shops or other metal working operations also use WD 40. Because the VOC content of WD 40 exceeds that allowed in the rule, these facilities would have to switch to compliant alternatives.

For information on alternative lubricants and rust inhibitors, call Katy Wolf at IRTA at (818) 244-0300.

Need help finding an alternative? IRTA assists firms in converting to suitable alternatives in cleaning, paint stripping, coating, dry cleaning and adhesive applications.

TAC Listing Important for Dangerous Chemicals

An article in this issue of The Alternative concerning n-propyl bromide (NPB) use in dry cleaning demonstrates that air district employees cannot control the use of hazardous chemicals if they are not listed Toxic Air Contaminants (TACs). Even when companies want to use the chemicals near schools and other sensitive sites, air district staff cannot restrict them. This is a serious problem because new chemicals that are marketed are obviously not on the TAC list. In fact, the suppliers market them as alternatives to chemicals that have been used for years and are on the TAC list. In some cases, there is toxicity information on the new chemicals that can be used to justify a TAC listing.

NPB is an example of one such chemical. It is a reproductive toxin and can cause nerve damage. It is used in vapor degreasing applications, in adhesive formulations, in aerosol cleaning applications and now it is being marketed and used in dry cleaning. The suppliers market it as a "safe" alternative to ozone depleting solvents and chlorinated solvents. Production of the ozone depleting solvents has been banned and the chlorinated sol-

(see **TAC Listing** *page 7)*

CARB Moves Ahead on Consumer Products Regulations

The California Air Resources Board (CARB) is developing a consumer products regulation that is scheduled to be adopted by their Board in November of this year and June of 2009. The consumer product categories that are being regulated at the November Board meeting include:

- air fresheners
- general purpose cleaners
- general purpose degreasers
- furniture maintenance products
- glass cleaners

CARB held a workshop for interested parties on August 27 to discuss the proposed regulation. CARB received over 500 completed surveys that provide data on over 10,000 products in categories that will be regulated in November and in June 2009. For the November regulation, the discussion concerned 2,500 products.

For general purpose cleaners, CARB is proposing to reduce the current four percent by weight VOC limit to 0.5 percent. This would result in a reduction of 5.1 tons per day, the largest reduction for the categories. The total reduction for all categories would amount to about 10 tons per day.

In June, 2009, CARB is planning to regulate spotting chemicals used in the dry cleaning industry. CARB has not previously surveyed this industry and will start conducting the survey shortly. Spotting chemicals are used by the industry to remove spots from garments before and after the major textile cleaning process. The primary chemical used today in spotting agents is trichloroethylene (TCE), a carcinogen that is a listed Toxic Air Contaminant. It is also classified as a VOC. IRTA conducted a project, sponsored by EPA and Cal/EPA's Department of Toxic Substances Control (DTSC) to identify, develop, test and demonstrate alternative low-VOC, low toxicity spotting chemicals. Alternatives include water-based and soy based materials. In another IRTA project, sponsored by the Bay Area Air Quality Management District, IRTA is currently testing additional water-based and soy based cleaners.

CARB is also planning to regulate paint thinner and multi-purpose solvents at the June 2009 Board hearing. CARB has established a working group and held the first meeting in August. IRTA completed a project a few years ago that involved identifying, developing, testing and demonstrating alternative low-VOC, low toxicity consumer product thinners and cleanup materials. IRTA identified alternatives that met a 2.5 percent VOC content limit. The alternative thinners and cleanup materials were based on acetone, a propylene glycol ether and soy. A VOC emissions reduction for this category of 13.6 tons per day could be achieved by establishing a three percent VOC limit.

At the June 2009 Board hearing, CARB is also planning to regulate consumer product paint strippers. Many such strippers rely on methylene chloride, a carcinogen that is listed as a Toxic Air Contaminant. Other strippers use n-methyl pyrollidone (NMP), a reproductive and developmental toxin. CARB has surveyed the category and is reviewing the survey data. IRTA completed a project recently that was sponsored by DTSC to find alternatives to methylene chloride and NMP consumer product paint strippers. IRTA found effective alternatives applications that are low-VOC and low in toxicity.

Reports on alternative spotting chemicals, consumer product thinners and cleanup solvents and consumer product paint strippers are on IRTA's website at www.irta.us. For more information or to discuss specific applications, call Katy Wolf at IRTA at (818) 244-0300.

TAC Listing *(continued from page 6)*

vents, trichloroethylene (TCE), perchloroethylene (PERC) and methylene chloride (METH) are all listed TACs.

A second example of a hazardous chemical that is now used widely is D5, a siloxane chemical. D5 has caused cancer in laboratory animals. It is extensively used in the dry cleaning industry under the tradename GreenEarth. It is also used in repair and maintenance cleaning in parts cleaners by auto repair and industrial facilities. Finally, it has been used in consumer product applications including personal lubricant products. It is marketed as a "green" alternative to PERC in dry cleaning and chlorinated and VOC solvents in repair and maintenance cleaning. In spite of the fact that D5 is a carcinogen, it is not a listed TAC.

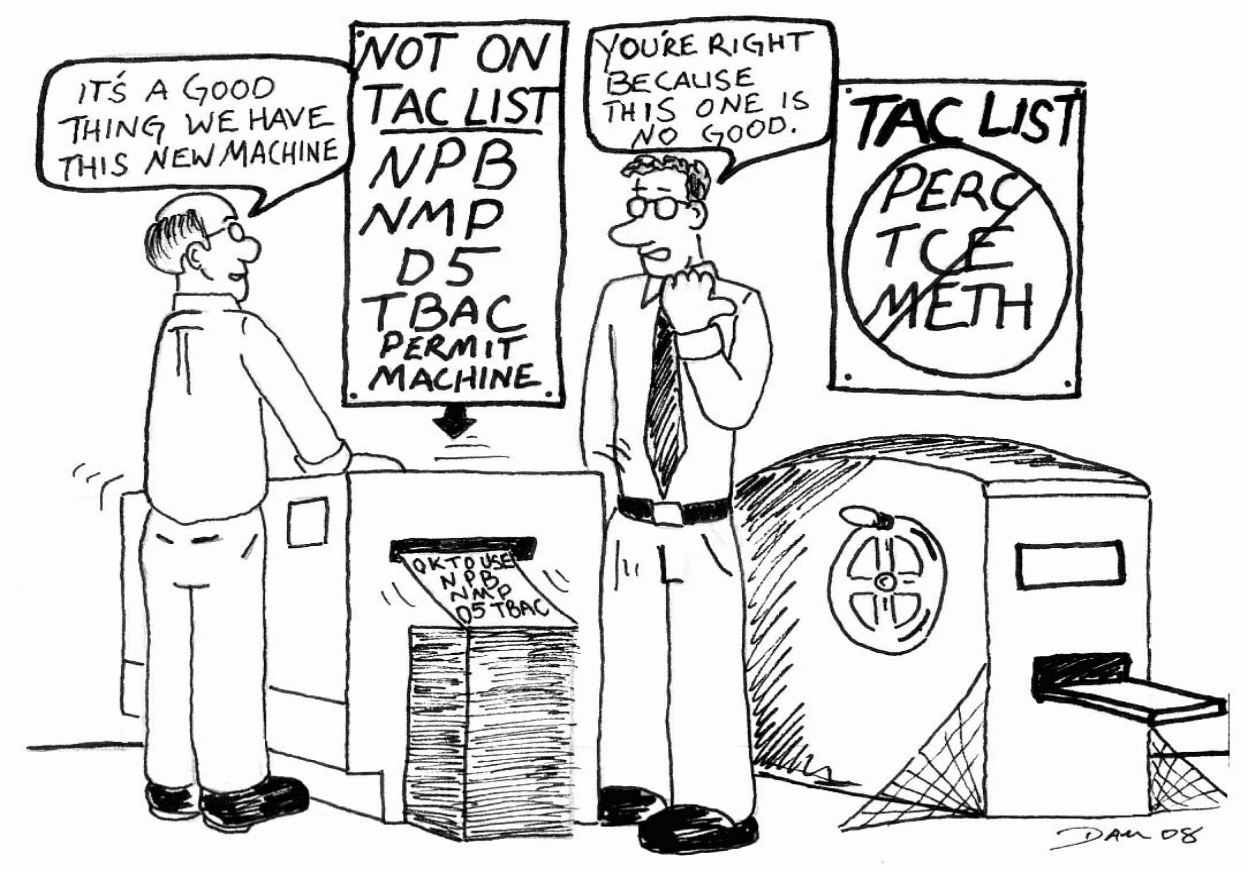
A third example of a new and emerging chemical is tert-butyl acetate (TBAC). TBAC forms a metabolite that is a carcinogen. TBAC is used in certain types of coatings and as a cleanup material for autobody coatings. It is being marketed as an alternative to VOC and chlorinated solvents, some of which are listed TACs. Even though toxicity data show that the use of TBAC poses a cancer risk, it is not a listed TAC.

A fourth example of a chemical that is not a listed TAC is n-methyl pyrollidone (NMP). The chemical is used in various types of cleaning applications and in consumer product and industrial paint strippers. NMP is a reproductive and developmental toxin. It is marketed as a "safe" alternative to methylene chloride in paint strippers and chlorinated solvents in cleaning applications.

The California Air Resources Board (CARB) is responsible for proposing chemicals for addition to the TAC list. No chemicals have been proposed for listing for many years. IRTA has requested that CARB propose listing the four chemicals discussed above based on their current and likely future widespread use and based on the fact that toxicity information on them is available. Currently because they are not listed, they can be used without controls.

IRTA completed a project a few years ago which was sponsored by EPA and the Hazard Evaluation System & Information Service (HESIS) which focused on alternatives to three of the chemicals discussed here, NPB, D5 and NMP. IRTA also completed another project, sponsored by EPA, that addressed alternatives to TBAC. Both reports are on IRTA's website at www.irta.us.

For information on alternatives to the four dangerous chemicals, call Katy Wolf at IRTA at (818) 244-0300.



CALENDAR

September 30
Dr. Katy Wolf of IRTA will present a webinar "Safer Alternatives for Auto Repair Cleaning." For Information, call IRTA at (818) 244-0300.

October 22-24
Western Sustainability and Pollution Prevention Network (WSPPN) 2008 Conference, Monterey, California. Hyatt Regency Monterey. For information, visit www.wsppn.org

December 5
South Coast Air Quality Management District Governing Board Hearing for Proposed Rule 1144 "Lubricants and Rust Inhibitors" Diamond Bar, California. For information, call Mike Morris at 909-396-3282

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IRTA is working together with industry and government towards a common goal -- implementing sensible environmental policies which allow businesses to remain competitive while protecting and improving our environment. IRTA depends on grants and donations from individuals, companies, organizations , and foundations to accomplish this goal. We appreciate your comments and contributions!

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