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Senate of Pennsylvania

October 27, 1999

Sharon K. Freeman
 Regulatory Coordinator
 Environmental Quality Board
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Original: 2058

Mizner

cc:

Harris

Nanorta

Wilmarth

Sandusky

Legal, Notebook

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RE: Reg. # 7-346 - Solvent Cleaning Operations

COMMITTEES
 ENVIRONMENTAL RESOURCES & ENERGY,
 CHAIRMAN
 APPROPRIATIONS
 PUBLIC HEALTH & WELFARE
 CONSUMER PROTECTION & PROFESSIONAL
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 CENTER FOR RURAL PENNSYLVANIA
 ENVIRONMENTAL QUALITY BOARD

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Dear Sharon:

I am writing to offer my support for the comments received by the Environmental Quality Board by the PA Chamber of Business and Industry and Lucent Technologies. These comments were submitted regarding the Environmental Quality Board's proposed rulemaking for Solvent Cleaning Operations.

There is significant concern expressed in these comments that this proposed regulation could unnecessarily restrict the use of solvents while increasing the cost of doing business in the Commonwealth. If Pennsylvania is to be more stringent than federal standards, it is important that the Environmental Quality Board take the experiences and recommendations reflected in these comments into consideration as this regulatory review process proceeds. Such regulations can work to the detriment of Pennsylvania's manufacturers who compete interstate and worldwide.

Thank you again for the opportunity to share my thoughts regarding this regulatory proposal.

Sincerely,

Mary Jo White

MARY JO WHITE
 SENATOR, 21ST DISTRICT

MJW/ph

cc: The Honorable Raphael Musto, Democratic Chairman
 Senate Environmental Resources & Energy Committee
 Sharon Roth
 PA Chamber of Business & Industry
 John O'Sullivan
 Lucent Technologies

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October 5, 1999
Testimony

Pennsylvania Chamber of Business and Industry

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**Testimony on the Proposed Regulations for Solvent Cleaning
Operations**

Presented to the Environmental Quality Board

**October 5, 1999
Southcentral Regional Office of DEP
Harrisburg, Pennsylvania**

Good morning. My name is Sharon Roth. I am the Director of Regulatory Affairs for the Pennsylvania Chamber of Business and Industry (the Chamber). I want to thank the Environmental Quality Board and the Department of Environmental Protection for the opportunity to provide testimony on Pennsylvania's proposed changes to the regulations for solvent cleaning operations.

The Pennsylvania Chamber of Business and Industry is the largest, broad based business association in Pennsylvania. Our more than 6,000 members employ about 50% of Pennsylvania's private workforce or approximately 1.5 million people. 80% of our members have *less than* 100 employees. The Chamber is dedicated to advocating reasonable regulations that encourage economic growth while protecting the environment.

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The package before you greatly concerns the Chamber's membership. On August 9, 1995 DEP Secretary James Seif announced the "regulatory basics initiative" (Executive Order 1996-1) at the Chamber's DEP Quarterly meeting. He challenged the Chamber to identify regulations or policy that were more stringent than federal standards, overly burdensome or costly, outdated or unclear. On November 15, 1995 the Chamber met the challenge and delivered a 156 page document full of regulations that qualified for the regulatory basics initiative with recommendations for improvement. To our members, this initiative signified the dawning of a common sense approach to the regulatory process and a recognition that environmental protection and economic prosperity were not mutually exclusive.

While we have seen improvement over the past few years in various areas, this particular package appears to be a deviation from the spirit of the regulatory basics initiative. This regulation is being proposed to update equipment requirements to current technology and mandates improved operating practices to stress pollution prevention. However, it will greatly restrict the use of solvents in cleaning operations while potentially increasing the cost of doing business. In

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many cases, there is no satisfactory alternative to the solvents our members are using.

The current regulation breaks solvent cleaning into three parts: cold cleaning degreasers, open top vapor degreasers, and conveyORIZED degreasers; all of which apply only to degreasers with an opening greater than ten square feet (sq. ft.).

The new proposal breaks solvent cleaning equipment into four different kinds: cold cleaning machines (immersion and remote reservoir types), batch vapor, in line vapor, and airless/air tight machines. The proposed regulations would cover all sizes of solvent cleaning machines, not just those with openings greater than 10 sq. ft. With no de minimis limit, even dipping parts in a pan or beaker would be covered by the rule. It is also critical to note that the proposed rule alters the distinction between cold degreasers and vapor degreasers by defining all heated degreasers as vapor degreasers whether or not the solvent is boiling (this is opposite to the current regulations and opposite to the way EPA defines cold and vapor degreasers under the federal MACT standard.)

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An additional requirement to dispose of used hand wipe rags into closed containers is also proposed. This will prohibit air drying of rags and will increase waste disposal costs for small businesses in particular.

While the DEP assumes these vapor pressure restrictions will result in a cost savings to industry and that compliant alternative cleaning methods will be available for all cleaning processes; this will likely not be the case. Industry may have difficulty finding cleaning alternatives that comply with the new rule for all industrial or commercial applications. Compliant alternatives may be costly, efficiencies and quality may suffer due to less effective cleaning options, and parts drying time will be drastically increased, with no assured reduction in emissions.

The new regulations for batch vapor, in line vapor, and airless/air tight machines adopts the EPA's Degreaser MACT standard for hazardous air pollutants (HAPS), including the alternative emission limits, as a means of compliance. However; while the Federal regulations cover only 6 halogenated solvents that are HAPS, the DEP proposal extends these regulations to all solvent cleaning operations - even if using Non-HAPS, or even if using non-VOCs. This may require product

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substitution, additional equipment, and monitoring expenditures for facilities with these types of equipment. In addition, this makes Pennsylvania's program more stringent than the federal standards.

Following are some concerns that were raised by our members. We will include more detail and additional concerns in our written comments:

CURRENT DEGREASER MACT STANDARD:

There is currently a MACT standard that covers six hazardous halogenated solvents. The DEP rule copies the requirements of the vapor (Batch or Conveyor) Vapor Degreasers and the Airless/Air Tight Degreasers from the Federal rule, including the emission exemption levels. This MACT standard has equipment requirements for Cold Degreasers and Remote reservoir cleaners that permit the use of these six Halogenated solvents. **The proposed rule is significantly more strict than the MACT for Cold Degreasers and remote reservoir cleaners in that it completely disallows the use of these six chemicals.**

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The Rule is Not Internally Consistent:

Chapter 129.63(f) states that “as an alternative to complying with subsections (a) - (d), the operator of a solvent cleaning machine may demonstrate compliance with paragraph (1)” (an exemption based on emission limits). Following in section (f) are exemptions for Batch Vapor and In-Line Vapor cleaning machines, and Airless and Air-Tight cleaning machines. **While paragraph (f) states that exemptions are included for equipment covered under paragraph (a) (Remote Reservoir and Immersion Cold Cleaning Machines), no exemption levels are given for these types of equipment.**

Note that exemptions based on emission levels, if they were included in the rule, would only provide relief to cold cleaners with small throughputs. Solvent drag out (see below) would be the largest portion of losses from cold cleaners with large throughputs.

THE CALCULATIONS AND ASSUMPTIONS FOR VOC AND COST REDUCTIONS USED AS THE BASIS OF THIS PROPOSAL ARE FLAWED:

The proposed emission reductions resulting from the vapor pressure limits are based on equipment standing losses, with no inclusion of drag out. Cold

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cleaning degreasers vary in size from handling just a few pounds/day to processing many tons in a day. For large cold cleaning degreasers which process high volumes, the assumption that the majority of emissions is based on standing losses is incorrect. The majority of emissions from this equipment are directly proportional to the wetted surface area of the parts leaving the machine and most typically air-dried after leaving the process. The reduction of vapor pressure, while slowing the drying rate, will not significantly reduce the VOC emissions from this drag-out on the parts. It will however significantly increase the cost of producing many manufactured goods, since slower drying may necessitate the installation of drying ovens or may simply slow overall production rates with resultant loss in profits. For some processes, compliance with these rules through substitution of alternate solvents will increase chemical costs many times. Switching to lower vapor pressure (and inherently less effective) solvent cleaners will increase the cleaning process cycle times while also increasing re-work on these items, both of which lead to increased overall emissions. The resulting increase in drying time may also cause logistical problems for manufacturers.

For some industries the emissions reduction will be less than is assumed by the DEP analysis (2/3 reduction in solvent usage is estimated by DEP).

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Exemptions Need To Be Included in the Regulation for Those Who Use Non-VOC

or Low Volatility Solvents:

Rather than mandate the use of low volatility solvents, DEP should provide incentives to use such solvents by exempting those who use such solvents from the equipment and recordkeeping requirements of the Rule. DEP states that its proposed rule is modeled after the Rule promulgated for the Los Angeles area. That rule includes an exemption for those degreasers using Clean Air Solvents, defined in California as solvents with VOC vapor pressures of less than 5 mm Hg. (Note that the California volatility limit is five times higher than the DEP proposed limit.) The Southeast Ozone Stakeholders Group recommended that DEP include an exemption for those using a solvent with a VOC vapor pressure of less than 5 mm Hg. If this rule proceeds, and low volatility solvents are required for certain applications, the California limit should be adopted rather than the more stringent 1 mm Hg limit in the currently proposed rule.

The proposed rule will regulate all solvent degreasers, even those which use non-VOC solvents (such as acetone and certain perfluorocarbons). Since these compounds do not contribute to ozone formation, there is no rationale for

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regulating such solvents under the guise of a RACT rule. This rule is thus more stringent than any other solvent rule in effect in America today.

Exemptions For Cleaning of Non-Metal or Electronics Components Need to Be Incorporated Into This Rule

Other states that have enacted similar rules have either limited the applicability of the rule to cleaning of metal parts (Maryland), or have specifically exempted certain types of operations such as cleaning of electronics components (Illinois and California). Pennsylvania should adopt similar exemptions, especially for the semiconductor and optoelectronics industries in which manufacturing tolerances do not permit substitution of solvents.

Storage and Disposal of Solvent Soaked Rags

Under the rule, all rags, paper towels or other materials used in hand-wipe cleaning with a solvent which contains more than 5% VOC or HAP must be stored in a closed container, pending disposal or recycling. There is no de minimis level for this requirement. There has been no apparent assessment by the Department as to whether this practice will create any potential fire or other safety hazards. The

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implications of this rule, in terms of its impact on waste disposal requirements, and the resultant cost impacts on industry, have also not been assessed.

Conclusion

While the reduction of air pollution is an important objective for Pennsylvania, this proposal could prove too costly for industry, and does not recognize the unique cleaning needs of various industries; nor does the proposal allow for exceptions or alternative compliance methods. The proposal's lack of a de minimis limit is a significant departure from the current Pa regulations that regulate only degreasers with an opening greater than ten square feet which are used to clean metal parts. In addition, this proposal is more stringent than the comparable federal standards.

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**TESTIMONY OF LUCENT TECHNOLOGIES' MICROELECTRONICS
GROUP BEFORE THE ENVIRONMENTAL QUALITY BOARD**

By John P. O'Sullivan

October 5, 1999

Proposed Rulemaking – Solvent Cleaning Operations
29 Pa. Bull. 4661 (Aug. 28, 1999)

Greeting

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Good morning. My name is John O'Sullivan and I am the Environment, Health and Safety Manager at the Reading Facility of Lucent Technologies' Microelectronics Business Group. With me is Phillip Cornejo, the Air Quality Engineer at Lucent's Reading Facility. I am here today to provide the Environmental Quality Board and the Department of Environmental Protection with comment on the Solvent Cleaning Operations Proposed Rulemaking.

Background

I would like to begin by explaining who we, at Lucent Microelectronics are, what we do, where we came from, and where we are headed.

The Microelectronics Group has its worldwide headquarters in Allentown, Pennsylvania. It grew out of Western Electric's electronics components business, which was the first in the world to manufacture transistors. Today, this Lucent business group is the world's leading provider of semiconductors for communications applications. More than 75 percent of the group's revenues derive from communications components including high-performance systems semiconductor chips and optoelectronics devices. Lucent's integrated circuit business is one of the fastest-growing semiconductor businesses in the world serving customers such as Motorola, Sun Microsystems, Compaq, Quantum, Seagate, and Hewlett-Packard.

Lucent's Microelectronics Group provides high-quality products that enable customers to deliver and receive voice, data, and images. Among the products we manufacture in Pennsylvania are: (1) Integrated Circuit Digital Signal processors for modems, wired, cordless and cellular phones; (2) components and subsystems for fiber-optic telecommunications; (3) Standard-cell Application Specific Integrated Circuits, or ASIC's, for disk drives and other applications; and (4) Field Programmable Gate Arrays for telecommunications networks. Lucent's Microelectronics Group is on the leading edge of the development of semiconductor chips used in communications devices and networks. Our chips even come with a lifetime warranty.

Focusing in closer on the Pennsylvania operations, in addition to our Allentown Headquarters, we also have manufacturing facilities in Muhlenberg Township, located just outside of Reading, and in Breiningsville, midway between Allentown and Reading. Employing more than 3,900 people, the Allentown facility primarily produces Digital Signal Processors, ASIC's, and other communication related integrated circuits. The Reading facility employs nearly 2,300 people and its principle products include linear bipolar as well as high voltage integrated circuits that are used in telephone electronic switching systems, computer disk drives, and computer modems. Reading's Optoelectronics Product Unit manufactures devices for the transmission, amplification, and receipt of voice, data, and video communication signals through optical fibers. Specific devices made at Reading include cable television and high-speed digital distributed feedback laser modules, pump lasers, and other optical devices. Finally, 1,200 people work at the Breiningsville facility. Breiningsville is a leading supplier of optoelectronic modules and components serving the cable television, telecommunication, and network computing markets.

Lucent has high aspirations for transforming the Lehigh Valley and the Reading area into high-tech centers. Capital spending at the three Pennsylvania Microelectronics facilities increased 32% from 1998 to 1999 to nearly \$200 million. In fact, Lucent is busy as we sit here today preparing to construct a new \$165 million office building at the Allentown Facility that, when complete in two years, will have space for 2,300 additional workers. As the Philadelphia Inquirer noted in its recent September 27 article, "... [n]ear long shuttered area plants that once made steel girders to build bridges and roadways for cars and trucks, Lucent semiconductors are paving the way for bits and bytes to travel the world." Clearly, Lucent has every intention of remaining a strong presence in Eastern Pennsylvania, a responsible employer of thousands of Pennsylvanians, and a good neighbor in the local communities where its employees live and work. However, this Solvent Cleaning Rule poses a real threat not only to Lucent's expansion in Pennsylvania, but also to its ability to operate here at all. Let me explain.

Concerns With The Proposed Rule

The proposed rule targets the use of volatile organic compounds ("VOC's") in several types of solvent cleaning operations including, cold cleaning machines, hand wipe operations, vapor cleaning machines, airless cleaning systems, and air tight cleaning systems. Under the rule, this equipment and these operations must meet design, work practice, control, record keeping, and emission limitation requirements. In addition to the concerns with the regulation that I will share with you in a moment, I want to express support for the comments of the Pennsylvania Chamber of Business and Industry, especially as they concern the proposed regulation of hand-wipe operations, non-VOC solvents, and halogenated solvent cleaning operations currently exempted under federal regulations.

The proposed rule goes too far in its broad definition of a "solvent degreasing operation" insofar as it captures necessary cleaning operations beyond the degreasing of metal parts.

Moreover, it ignores the distinction between cold degreasers and vapor degreasers by defining all heated degreasers as vapor degreasers whether or not the solvent is boiling – this represents a 180 degree shift from the current regulations, as well as from the manner in which EPA defines cold and vapor degreasers under the federal Maximum Available Control Technology standard. No relief from the broad scope of the rule can be found in the rule’s definitions since none were provided for the critical terms “machine,” “degreaser,” “degreasing,” and “parts.” The overly broad nature of the proposed rule is further evidenced by the incomplete definition provided for the term “solvent,” which:

1. Fails to exclude non-VOC solvents from its grasp such as acetone, perfluorocarbons, and hydrofluorocarbons, none of which contribute to ozone formation and all of which are excluded in the federal definition of “VOC” under 40 CFR §51.100(s); and
2. Fails to provide for a threshold below which an exemption is allowed. With no de minimis exemption, even the cleaning of components in a small beaker, like this one, would require compliance with this rule.

From Lucent’s perspective, the result of these failures is that the necessary “cleaning” steps that must occur in the manufacture of semiconductor and optoelectronic components can literally no longer occur. It is critical to make clear that none of our “cleaning” processes in which solvents are used constitute “degreasing” in any sense; instead, we remove a protective “film” that had been placed onto the surface of the semiconductor wafer, integrated circuit, or optoelectronic component as a prior process step. This film allows the wafer, circuit, or component to move to the next step of the process where it may undergo, among other process steps, etching, deposition, and/or implantation. While the proposed regulation draws no distinction, the placement and removal of this protective layer is wholly different than metal parts cleaning. Our concern with this lack of distinction is created by the proposed definition of the term “cleaning machine” which includes the use of a solvent for removal of a “coating.” Similar rules in other states define solvent cleaning as removal of grease or of a contaminant.

The current state of the art in semiconductor and optoelectronic manufacturing requires the use of VOC containing solvents in many stages of the manufacturing process. Solvents may be used at room temperature, heated to below the boiling point, or as a vapor. Solvents are generally used in small baths, sinks, or beakers, none with solvent to air interfaces greater than 5 square feet. Containers with a solvent to air ratio of less than 10 square feet are currently exempted by the Department. Based upon state of the art manufacturing processes, the cost to control emissions for smaller units would be unreasonable and would yield little or no emission reduction. This is true for two reasons:

1. There are no non-VOC solvents commercially available for all of the process steps in which solvents are used in semiconductor and

optoelectronic manufacturing, notwithstanding the Department's reference in the Proposed Rule to citric-based solvents, which may be appropriate for the general cleaning of metal parts, but are unacceptable for the film removal on precision semiconductor components; and

2. Even if ultra-low VOC solvents were commercially available, their use in our process steps would result in significant delays between process steps. A delay would occur due to the fact that such solvents would take longer to dry, or because we would have to add process steps such as baking to counter the lower volatility of the solvents. It is also conceivable that additional process steps would be needed during which a second coat of ultra-low VOC solvent would be applied to ensure complete film removal from the wafer, circuit, or component.

In summary, the result of the proposed rule is that the cleaning steps that take place in the semiconductor and optoelectronic manufacturing process are swept in under this rule in a manner that makes continued fabrication of our products literally impossible. We use a variety of VOC and non-VOC solvents to remove photoresist and other coatings from silicon wafers and fiber optic components. Many of these operations are conducted in "clean rooms" where exhaust rates are very high and where contaminant tolerance is very low. There are no low-volatility solvents which are suitable for our applications, where removal of contaminants or coatings must be accurate to the Angstrom level (one ten-billionth of a meter).

It is thus imperative that these regulations be amended to exempt solvent processes used in the manufacture, assembly and testing of semiconductors and optoelectronics. Similar exemptions exist in California, Illinois, and Maryland, the only other states to have enacted low-volatility standards for cleaning solvents.

Comparison With Other Regulatory Frameworks

I would like to turn now to a brief discussion of the comparisons to the regulations of other states relied upon by the Department in its regulatory analysis.

In the analysis developed by the Department in support of this Proposed Rule, the Department suggests that the rules enacted in Illinois and Maryland have similar regulatory schemes, no different from what the Department proposes here. Without taking too much time here today, suffice it to say that a careful reading of the Illinois and Maryland regulations show that they provide either a de minimis exemption, pertain only to the removal of contaminants from metal parts, or carve out from its definitions certain electronics manufacturing.

Lucent Microelectronics Is Committed To Environmental Protection

In conclusion, I would like to tell you about the environmental commitment of my company.

The Microelectronics Group of Lucent Technologies has, as its express policy, a commitment to the protection and preservation of the environment and a safe and healthy workplace for its employees. It is our intent to be recognized by our customers, employees, community, and stakeholders as a business that upholds the highest standards of commitment to environmental responsibility, and one committed to continual improvement in environmental, health, and safety management. In support of this policy, and in recognition that environmental responsibility can go hand in hand with business success, in April of 1997, Lucent's Microelectronics Group, including these three Pennsylvania facilities, received ISO 14001 environmental certification making it one of the first multi-site businesses in the world to achieve this distinction. To receive business-wide ISO 14001 certification, all of the world-wide Microelectronics Group's manufacturing and design facilities had to conform with conditions and guidelines and pass stringent audits of their environmental management system, measured against ISO 14001 requirements. Strict adherence to these requirements is closely monitored by the Lucent Global Environmental, Health, and Safety Department and audited semi-annually by an independent ISO 14001 Registrar.

Beyond pure environmental responsibility, early in 1997, all of Lucent's Pennsylvania operations, including the three Microelectronics facilities, also were awarded the Occupational Safety & Health Administration's coveted Voluntary Protection Plan status for meeting or exceeding OSHA requirements.

Conclusion

In summary, this proposed rule as currently drafted, will have a devastating effect on our ability to manufacture semiconductors and optoelectronic devices in Pennsylvania. We hope that the Department will heed our concerns and make the necessary revisions to the proposed regulation to allow for a targeted exemption for the manufacture, assembly, and testing of semiconductor and optoelectronic components.

I thank you for your time and, either Mr. Cornejo, environmental counsel, or I would be happy to answer any questions.