

**Comments on the
Comprehensive Strategy to Reduce the Mercury Content of Products
Proposed by the Maine Department of Environmental Protection
and the Draft Report,
An Investigation of Alternatives to Mercury Containing Products,
Prepared by the Lowell Center for Sustainable Production**

I. SUMMARY OF COMMENTS

The report prepared by the Lowell Center for Sustainable Production (LCSP) provides excellent documentation of the available, affordable and effective alternatives to nearly all uses of mercury-containing switches and devices. The strategy proposed by the Maine Department of Environmental Protection (DEP), however, does not fully constitute “a comprehensive strategy to reduce the mercury content of products with the goal of maximizing the reduction of mercury emissions to the environment,” as required by statute. To fully comply with legislative intent, the Environmental Health Strategy Center strongly recommends that the proposed strategy be modified to incorporate the following recommendations:

1. Narrow the proposed exemption of industrial thermostats from a sales prohibition so that only applications involving harsh or extreme environmental conditions are exempted;
2. Rather than exempting the replacement of mercury switches and relays in existing equipment from the sales ban, such replacements with another mercury component should be prohibited unless specific suggested criteria are met that define the replacement as not cost competitive;
3. Manufacturers should be required to ensure that a system exists for the proper collection, transportation and management of mercury products at the end of their useful life whenever an exemption from an effective date of a sales prohibition is granted and for all products generically exempted from the sales prohibition;
4. Similar manufacturers’ responsibility should be required for mercury products with large existing stocks such as thermostats in residential and commercial use;
5. Mercury lamps should be required to be labeled as an alternative to a sales prohibition;
6. Mercury button cells batteries should be defined as mercury-added products, and thus subject to a disposal ban and labeling requirements, as an alternative to a sales prohibition; and
7. Mercury dental amalgam separators should be required to be installed at all dental offices in lieu of a sales prohibition on dental amalgam.

II. INTRODUCTION

These comments first review the legislative charge behind this work and the elements of DEP's proposed comprehensive strategy. Then specific elements of the strategy are addressed with recommendations for making it comprehensive. Comments on the LCSP report are woven into this discussion with additional miscellaneous comments included at the end of these comments.

Legislative Mandate:

Chapter 620 of the Laws of Maine enacted by the 120th Legislature (LD 2004) requires the Commissioner of Environmental Protection to submit a report to the Legislature by January 1, 2003 that includes a summary of all data received under the mercury product notification provisions of 38 MRSA 1661-A, and based on those data:

“... a comprehensive strategy to reduce the mercury content of products with the goal of maximizing the reduction of mercury emissions to the environment.”

In its October 31, 2002 cover letter transmitting the draft report by LCSP for public comment, the DEP described the outline of said comprehensive strategy as including the following elements, possible additions and limitations:

Proposed DEP Strategy:

- § Prohibit the sale of most new mercury-containing measuring devices and most new products containing mercury switch/relay components
- § The prohibition would become effective July 1, 2006

(DEP says that this is the effective date of a similar product sales prohibition in Connecticut; allowing about three years for consumers and manufacturers of new products to make appropriate adjustments. Actually, the sales prohibition in Connecticut is effective July 1, 2004 for mercury products containing more than one gram of mercury, and July 1, 2006 for mercury products containing more than 100 milligrams of mercury).

Strategy Under Consideration by DEP:

- § In order to obtain an exemption from the prohibition effective date, require manufacturers of mercury-containing products to ensure that a system exists for the proper collection, transportation and management of their products at the end of their useful life (similar to legislation in Rhode Island and Connecticut)
- § Attach a similar requirement to measuring devices, switches and relays generically excluded from the prohibition (e.g. industrial thermostats)

Proposed Limits to DEP Strategy:

- § Would not restrict the replacement of mercury switch/relay components for existing equipment
- § Would not prohibit the sale of industrial thermostats

- § Would not prohibit the sale of measuring devices/switches/relays required by federal law
- § An exemption process would be available for new products to address flame sensor switches, relay applications and potentially other heretofore unidentified instances where no functional non-mercury alternatives are available at reasonable cost
- § The proposed strategy will be limited to measuring devices and switches/relays since, according to DEP, these were the only products receiving a detailed evaluation by LCSP and they account for most of domestic mercury used in non-dental amalgam products according to available sources

II. COMMENTS ON PROPOSED STRATEGY

The strategy proposed by the Department does not fully constitute “a comprehensive strategy to reduce the mercury content of products with the goal of maximizing the reduction of mercury emissions to the environment.”

“Comprehensive” means “covering a subject or matter completely or almost completely” (The American Heritage Desk Dictionary, 1981). While the proposed strategy would cover important mercury product categories for which alternatives are readily available, much is not covered by the strategy. Generic exemptions are proposed for switch/relay replacements and for industrial thermostats, even though mercury-free alternatives may be available and affordable for several of these applications. Other mercury products are deemed outside the scope of the strategy, although mercury-free alternatives are or may be available for those products.

The proposed strategy relies almost exclusively on sales prohibitions, when other strategies are available that will reduce the mercury content of products. Certainly requiring manufacturers to be responsible for collection and safe management of mercury products at the end of their life is a strategy that should be applied universally across all mercury product categories, not just those under consideration by the proposed DEP strategy. However, additional policy tools, such as labeling, disposal bans and treatment requirements, are also proven to reduce the mercury content of products over time and are more suitable to product categories for which alternatives are not yet available.

A. **The proposed prohibition on the sale of nearly all switches and devices is well supported.**

The LCSP report documents the ample availability of cost competitive mercury-free alternatives in the marketplace to meet the functionality requirements for most of the mercury switches and devices now in use. This is an excellent foundation upon which to build the beginning of a comprehensive mercury content reduction strategy.

B. **The exemption proposed for industrial thermostats is too broad.**

DEP’s strategy should not continue to generically exempt from a sales ban all mercury-added industrial thermostats as proposed. In order to encourage use of mercury-free digital thermostats, DEP should narrow the existing exemption to only those industrial situations where functionally equivalent mercury-free thermostats are not available.

The widespread availability of mercury-free digital thermostats and the large amount of mercury present in existing thermostats prompted legislative action in 2002. The Legislature prohibited the sale of mercury-added thermostats after January 1, 2006, “except for a thermostat used for manufacturing or industrial purposes and except for a thermostat used by a blind or visually impaired person.” (38 MRSA 1661-C, sub-§5)

The LCSP helps us understand that this manufacturing/industrial exemption is too broad because it does not distinguish among those industrial applications suitable for a digital mercury-free thermostat. The LCSCP report acknowledges that “[D]igital electronic thermostats are available for industrial type workloads and temperature control.” Further, some manufacturing applications are more akin to the residential and commercial uses subject to the existing statutory sales prohibition than they are to heavy industrial applications. LCSP cites “manufacturers who supply digital thermostats for light industrial purposes” (p.31). For offices and other commercial like applications that occur in a manufacturing facility, mercury thermostats are unnecessary and should not qualify for an ‘industrial’ exemption. “The manufacturers of digital thermostats indicated that they ... can be used in low-level industrial applications.” (LCSP, p.67).

They caution, however, that “[S]ituations in which digital thermostats would not perform as well as mercury products are cases of extreme environmental conditions and areas at risk of explosions or fire.” LCSP concludes that “[I]t appears that no functional alternatives to mercury thermostats for industrial settings with harsh environmental conditions are available” (p.31). [emphasis added]

Recommendation:

Narrow the exemption to the existing thermostat sales ban so that only applications involving harsh or extreme environmental conditions are exempt. To accomplish this, amend 38 MRSA 1661-C, sub-§5 as follows:

After January 1, 2006, a person may not sell or offer to sell or distribute for promotional purposes a mercury-added thermostat except for a thermostat used under extreme or harsh environmental conditions for manufacturing or industrial purposes and except for a thermostat used by a blind or visually impaired person.
[new language underlined]

If necessary to be more precise in a rulemaking or exemption process, there are technical degrees of protection defined for different operating environments encompassed in ratings developed by the National Electrical Manufacturers Association and internationally. These can be used for further guidance and reference in implementing this suggested amendment.

C. The proposed exemption for replacement of mercury switches and relays in existing equipment is too broad.

DEP proposes a blanket exemption from the sales ban for all replacement components that are mercury based. Unless narrowed, this proposed exemption would ensure the indefinite sale and use of some mercury components, such as float switches used in

conjunction with non-automatic bilge pumps. Such an outcome would be environmentally unsound and unnecessary since mercury-free bilge pumps are readily available and cost competitive. Other similar examples probably exist.

Mercury switches and relays have great environmental health significance for several reasons:

- § Large amounts of mercury are used in switches and relays (more than 18 million grams reportedly used by manufacturers in the United States in just 2001);
- § Mercury switches and relays are used in hundreds of products and applications;
- § Recovery rates for mercury at the end of product life are poor; and
- § Mercury free alternatives exist for nearly every use of mercury switches and relays.

In some cases, should a mercury component fail, the mercury component or the product containing the mercury component can be easily replaced with a functional equivalent at a competitive cost. For example, consider the example of the submersible bilge pump.

There are three commonly available types of pumps made by one large manufacturer, Rule Industries. One pump relies on a separately installed mercury float switch to ensure automatic function (a manual mercury-free panel switch can be used instead but is not considered further). The other two pumps are mercury-free. One turns on automatically on a regular basis and stays operational if resistance on the impeller indicates the presence of water; otherwise, it turns off after one second. The third pump option has a built in float switch which is non-mercury-based. These pumps are compared in Table 1 below.

Under DEP’s proposed ‘retrofit exemption,’ a user of a non-automatic bilge pump with a mercury float switch could continue to replace the switch with another mercury component whenever the mercury switch failed. It would be considered a component of the bilge pump system rather than a stand-alone mercury product and would therefore be qualified for the exemption.

However, rather than buying another mercury float switch, the non-automatic bilge pump could be replaced with either of two mercury-free automatic bilge pumps. These mercury-free options are readily available from the same manufacturer and effectively perform with equal effectiveness to the mercury-based system.

Comparison of Rule Industries Bilge Pumps Sold at Hamilton Marine, Searsport	Non-Automatic Submersible Pump <u>Requires</u> Separate Mercury Float Switch	Automatic Submersible Pump Does Not Require a Float Switch	Fully Automated Submersible Pump with Built-in Non-Mercury Float Switch
Method of Operation	A separate mercury float switch rises with water level to activate bilge pump	Pump turns on every 2.5 minutes to check for water; turns off if no water present	A non-mercury float switch built into the pump is activated by rising water level

Requires Float Switch ?	YES	NO	YES
Float Switch is a Replaceable Component ?	YES	not applicable	NO
Switch Contains Mercury ?	YES	not applicable	NO
Pump Model:	RUL-025D	RUL-025S	RUL-RM-500
Pump Capacity:	500 gallons per hour	500 gallons per hour	500 gallons per hour
Pump Cost:	\$ 17.99	\$ 40.49	\$ 38.99
Typical Mercury Float Switch Model:	RUL-35, RUL-37	not applicable	not applicable
Float Switch Cost:	\$ 18.99 – \$ 27.99	not applicable	not applicable
TOTAL Cost:	\$ 36.98 – \$ 45.98	\$ 40.49	\$ 38.99
Pump Model:	RUL-027D	RUL-027S	RUL-RM-1100
Pump Capacity:	1,100 GPH	1,100 GPH	1,100 GPH
Pump Cost:	\$ 32.99	\$ 70.99	\$ 75.99
Float Switch Cost:	\$ 18.99 – 27.99	not applicable	not applicable
TOTAL Cost:	\$ 51.98 – \$ 60.98	\$ 70.99	\$ 75.99
<p><u>Notes:</u> All products are manufactured by Rule Industries (http://www.rule-industries.com/pumps2.htm). Costs are the sale prices listed in the 2002 catalog from Hamilton Marine, the largest discount ship's chandlery north of Boston with stores located in Searsport and Portland, Maine (www.hamiltonmarine.com).</p>			

As Table 1 demonstrates, the total cost of each of these pump systems is comparable at the lower flow capacity and the mercury-free pumps are slightly more expensive at the higher flow capacity. In a retrofit scenario for mercury float switches, the costs to compare are the replacement cost of the mercury float switch with the cost of a new mercury-free pump. Under such a retrofit scenario, the mercury free option is about 50% to 100% more expensive than simply installing another mercury float switch at the lower flow capacity. However, the absolute costs are relatively minor. A doubling in cost in this case means paying an extra \$ 11 to \$ 21.50 to go mercury free. For the higher pump capacity scenario, the cost differential is somewhat higher. Even so, the net additional amount spent to go with a mercury-free system would be \$ 48 - \$ 57.

This analysis demonstrates that a generic exemption from the sales ban on mercury product for all replacement switches would be counterproductive and unnecessary.

There's no doubt, however, that mandatory replacement with mercury-free alternatives in every instance would prove difficult and costly for some applications of mercury

switches and relays. Therefore, a narrower exemption with more balanced consideration of specific criteria is needed.

Recommendation:

A more discriminating set of criteria should be applied to the question of the cost effectiveness of retrofitting with mercury-free products/components, such as those identified in the LCSP report (pp.69-70) and listed below.

Under this recommended approach, the replacement of a mercury switch or relay with another mercury component should be prohibited unless one or more of the following criteria are met:

- § Numerous switches and/or relays are combined to perform a particular function
- § The switch or relay is integrated with other components of the product or application
- § There are heat dissipation issues presented by using the mercury free alternative
- § The physical size limitations of the product/application cannot be met by the mercury free alternative
- § A custom-designed rather than off-the-shelf switch or relay is used to meet unique operating requirements.

Using such criteria we would see the phase out, rather than the continued use, of mercury float switches in bilge pumps while allowing more challenging retrofit needs to continue to be met by mercury components. The outcome would be a more balanced and more comprehensive reduction in the mercury content of products.

D. DEP should require that manufacturers be held responsible for all mercury products at the end of their useful life.

The policy tool of Extended Producer Responsibility (EPR) creates proven incentives for manufacturers to redesign their products to reduce or eliminate hazardous constituents that are otherwise costly to manage safely at the end of a product's life.

We strongly agree with the principle under consideration by DEP that manufacturers of mercury-added products ensure that a system exists for the proper collection, transportation and management of their products at the end of their useful life.

However, it's too simple for manufacturers to simply assert, as did the automobile manufacturers in 2001-2002, that existing systems are adequate for collection, transportation and management of mercury products. It's too easy for manufacturers, such as those behind the Thermostat Recycling Corporation, to assert the adequacy of a program despite the lack of mercury recovery goals and poor performance in achieving significant recycling of mercury products.

The responsibility needs to go beyond assurance to active financial and/or physical responsibility for the product at the end of its life with specific numeric goals for mercury recovery.

Recommendation:

We recommend favorable consideration by DEP of the two strategic elements identified in its cover letter of October 31, 2002:

YES	In order to obtain an exemption from the prohibition effective date:	Manufacturers must ensure that a system exists for the proper collection, transportation and management of their mercury products at the end of their useful life
YES	For those measuring devices, switches and relays generically excluded from the prohibition:	

We further recommend extension of this policy principle to other products that represent a significant stock of mercury in use, e.g. thermostats in residential and commercial use. Such a requirement will help ensure that when the mercury content of these products is reduced as they are taken out of service, then the goal of maximizing the reduction of mercury emissions to the environment will be achieved.

Since Connecticut’s law was cited by DEP as a model to follow, the manufacturers responsibility provisions of this statute should also be proposed for Maine:

Sec. 9. (a) On and after July 1, 2003, no person shall offer any mercury-added product for sale or distribute any such product for promotional purposes unless the manufacturer either on its own or in concert with other persons has submitted a plan to the commissioner for a system that reasonably enables the collection of such products. If a mercury-added product is a component of another product, the collection system shall provide for removal and collection of the mercury-added component or collection of both the mercury-added component and the product containing it.

(b) The collection system shall include (1) a public education program to inform the public about the purpose of the collection program and how to participate in it; (2) a targeted capture rate for the mercury-added product or component; (3) a plan for implementing and financing the collection system; (4) documentation of the willingness of all parties to the system to implement the proposed collection system; (5) a description of the performance measures to be utilized and reported by the manufacturer to demonstrate that the collection system is meeting capture rate targets; (6) a description of additional or alternative actions that will be implemented to improve the collection system and its operation in the event that the program targets are not met; and (7) a recycling or disposal plan.

(c) Not later than July 1, 2004, and biennially thereafter, the manufacturer or entity that submitted the plan on behalf of the manufacturer shall submit a report to the commissioner and to the regional, multi-state clearinghouse described in section 3 of this act on the effectiveness of the collection system. The report shall

include an estimate of the amount of mercury that was collected, the capture rate for the mercury-added products or components, the results of the other performance measures included in the manufacturer's collection system plan, and such other information as the commissioner may require. The commissioner shall make such reports available to the public.

(d) The cost for the collection system shall not be borne by state or local government.

(Connecticut Public Act 02-90, Approved June 3, 2002)

E. The proposed strategy should include alternatives to reduce the mercury content of products that cannot be prohibited from sale.

DEP's proposed strategy to reduce the mercury content of products relies primarily on a prohibition on the sale of new mercury products after a date certain, with exemptions. This is an appropriate emphasis in the first instance but should not be the sole means by which mercury content reduction should be achieved.

For some mercury products, environmentally preferable mercury-free alternatives are not readily available at this time. For these products, a sales prohibition is precluded. Other policy approaches, however, can create incentives that encourage reductions in mercury content over time and eventual replacement with mercury-free alternatives.

The three product categories ripest for alternative strategies to reduce mercury content are lighting, batteries and dental amalgam.

1. Mercury Lighting

Lighting manufacturers have reduced the mercury content of fluorescent lamps from an average of 48 milligrams of mercury in a four-foot tube in 1985 to about 12 mg of mercury in 1999 according to the National Electrical Manufacturers Association. DEP's lamp study confirmed in 2001 that every new fluorescent lamp tested had well less than 10 mg of mercury content.

These reductions in mercury content were driven by manufacturers desire to avoid regulation of spent lamps as hazardous waste. They were also motivated by a wish to avoid other regulatory restrictions, like labeling and disposal bans, that might stigmatize and impede the expanded sales and marketing of energy efficient fluorescent lighting because of its residual mercury content.

This demonstrates that although environmentally preferable mercury-free alternatives have not been available, policy incentives have effectively contributed to the reduction in mercury content of fluorescent lamps. However, the job is not yet complete. Further reductions in the mercury content of fluorescent lighting and high intensity discharge (HID) lamps may be possible.

In addition, a new generation of mercury-free, solid-state lighting is emerging that will provide even greater energy efficiency than mercury-containing fluorescents or HIDs. Solid state lighting, based on semiconductor technology, is the first truly new lighting technology to emerge in one hundred years. Solid state lighting creates light without heat when a semi-conducting material converts electricity into light using light emitting diodes (LEDs).

Table 2 demonstrates the significance of the emerging solid-state lighting market. Solid state lighting is already competitive with incandescent lighting in many applications including, for example, the replacement of old traffic signals lights with great energy savings. Known historically for generating colored lighting, LED technology has now advanced to produce white lighting. Penetration of the general illumination market, and ultimately replacement of fluorescents and HIDs, is a major goal of technology development for solid state lighting in the years ahead.

Some applications of mercury-free solid state lighting appear to be commercially viable alternatives now to mercury-based fluorescent lighting. These include automobile instrument panel illumination and some display backlighting applications.

See Table 2 below.

Table 2 – Energy Efficient, Mercury-Free Lighting Making Major Inroads		
Lighting Category	LED Market Share	Total Lighting Market Share
Signs	31 %	11 % of electronic signs in U.S.
Display Backlighting	27 %	
Automotive lighting	22 %	32 % of center high-mounted stop lights for cars and light trucks worldwide > 50 % of instrument panel illumination in European-made cars
Electronic equipment	16 %	
Traffic signals	2 %	8 % of installed base in U.S.
Illumination	2 %	
<p>Sources: Jones-Bey H, Solid-state lighting expands as industry awaits illumination, <i>Laser Focus World</i>, April 2001; High brightness LED market forecast to reach \$3.4 billion by 2005, <i>CompoundSemiconductors Online</i>, 2001. Market share data from 2000.</p> <p>Notes: <i>Display backlighting</i> is used in mobile telephones and for other small LCD screens. <i>Automotive lighting</i> includes tail and signal lights, center high-mounted stop lights, instrument panel lighting. <i>Illumination</i>, or general lighting, is the sector with the greatest market share potential; current applications include machine vision, architectural and theme lighting, retail lighting, contour lighting, nightlights and flashlights.</p>		

Fluorescent and high intensity discharge lighting is a significant source of mercury. According to the partial, preliminary data summarized in the LCSP report (p.13), the mercury content of lamps in 2001 alone was:

2,092 grams of mercury in fluorescent lighting
16,051 grams of mercury in HID and other lamps

Clearly, any further policy measures that rationally target mercury lamps will help continue the needed drive toward zero mercury in lighting.

Recommendation:

First, DEP should propose that all mercury lamps in Maine be labeled. It's time to revisit labeling of mercury lamps in Maine. The Vermont labeling law was upheld by the courts. The Connecticut legislature required in 2002 that the packaging of mercury lamps be labeled. It's time for Maine to catch up.

Labeling would help ensure greater compliance with the disposal ban for mercury lamps thus maximizing the reduction in mercury emissions to the environment. Importantly, it would send a signal to lamp manufacturers that more effort is needed to reduce the mercury content of lamps and speed the development of mercury-free solid-state lighting.

Second, a serious evaluation is needed of the status and trends in mercury lighting applications and energy-efficient mercury-free alternatives. Why are certain applications of mercury lamps increasing in use and is that necessary? What are the priority applications that can be replaced now or soon with solid-state lighting? What are the barriers and needs for the expanded development of mercury-free lighting? How can we increase the capture rate for mercury lamps taken out of service?

These questions and others should be referred to a special task force convened by DEP, lighting researchers, manufacturers and other stakeholders. In fact, Connecticut has mandated a somewhat similar task force in their comprehensive mercury products bill of 2002:

Sec. 6 (b) Not later than July 1, 2003, the commissioner shall convene a working group which shall include, but not be limited to, government representatives from other northeastern states to evaluate advances in technology and make recommendations regarding the regulation of mercury-added products that have a mercury content in excess of ten milligrams or ten parts per million but less than one hundred milligrams or fifty parts per million and specialized lighting used in the entertainment industry such as metal halide lights. Within such working group, the commissioner shall convene a subgroup which shall include, but not be limited to, industry trade groups for mercury-containing lamps to develop a plan in accordance with section 9 of this act to provide for the collection of such lamps. The working group shall finalize such recommendations not later than July 1, 2004.

(Connecticut Public Act 02-90, Approved June 3, 2002)

The Connecticut approach should be modified to meet the specific needs of Maine in reducing the mercury content of lighting.

2. Mercury Batteries

The LCSP report indicates that batteries remain a significant use of mercury in 2001, accounting for 50,085 grams of mercury (p.14). Although the report fails to analyze this data, presumably this mercury is used primarily in button cell batteries, perhaps with some continued more limited use in mercuric oxide batteries used in mobile medical electronic equipment.

Currently, mercury-containing button cell batteries are totally unregulated, despite the following facts:

- § Button cell batteries are a non-durable disposable product with a limited useful life
- § An average button cell battery contains more mercury than a typical new four-foot fluorescent light bulb
- § Button cell batteries account for a significant amount of discarded mercury, apparently more than all mercury lighting combined
- § Button cell batteries are recyclable with an existing infrastructure for collection and recycling

For example, the Mercury Refining Company (Mereco) currently recycles mercury-containing silver oxide button cell watch batteries (<http://www.mercuryrefining.com/index.htm>). Mereco describes themselves as the leading approved recycler of silver oxide watch batteries.

As proven in the case of fluorescent lamps, without some degree of regulation, incentives are lacking to reduce the mercury content of button cell batteries and eventually to develop a mercury-free alternative.

Recommendation:

It's time for DEP to propose adding button cell batteries to the definition of mercury-added product, thus subjecting them to the disposal ban and labeling requirements. Such an action will promote reductions in mercury content while recognizing that alternatives are not yet readily available.

There's no technical justification for the disparate treatment that lamps and batteries receive under current law.

3. Mercury Dental Amalgam

As acknowledged in passing in the LCSP report, dental amalgam remains by far the most significant use of mercury despite the availability of safer alternatives. Reportedly, more than 8 million grams of mercury went into dental amalgam in 2001, accounting for 29 % of the mercury use quantified in Table 3.3 of the LCSP report (p.13).

More action is needed to encourage a reduction in the mercury content of dental amalgam. One way to do that is to further internalize the cost of managing waste mercury from dental operations.

Recommendation:

DEP should include in its proposed strategy a requirement that all dental operations be required to install advanced separator technology to significantly remove mercury particles and dissolved mercury from wastewater prior to discharge to the sewer system.

III. MISCELLANEOUS COMMENTS ON THE LCSP REPORT

General comment: The report does not specifically cite the sources for the facts asserted making it impossible to judge which personal communications, literature source or web information supports which assertions of fact throughout the report. This undermines the reader's ability to make independent judgements about the reports conclusions or to easily verify statements of alleged fact.

p.5 The report fails to clearly communicate and document which mercury products were excluded from priority consideration and explain why.

p.6. The conclusion about industrial thermostats in the Executive Summary is inconsistent with the discussion in the text (p.31, 67) that found that mercury free digital thermostats are available, affordable and effective for light industrial purposes and other industrial/manufacturing applications which do not involve harsh or extreme operating conditions.

p.6. The conclusion about gastrointestinal tubes in the Executive Summary is not supported by the discussion in the text (p.23, 66). The summary says that alternatives can not be recommended yet the text documents the replacement of mercury-based gastrointestinal tubes with a non-mercury alternative at a major medical institution.

p.8 Table 2.1 does not explain the distinction between Battery- button cell and Battery – general. What type(s) of batteries are included in the 'general' category? Mercuric oxide? Unknown? Button cells that couldn't be properly classified for some reason? Please explain and define.

p.9 The final version of this report should use the most recent data from the IMERC database, which may have been updated since the authors' review in June and July. This is important given the incompleteness of the IMERC database at the time of preparation of this report and the requirements of the legislative mandate to summarize all the notification data submitted.

p. 11 The fourth criteria selected for prioritization, "Is the product addressed by existing mercury regulations?," is too vague. It should have more specifically asked whether the product was subject to a sales prohibition. The fact that information on dental amalgam and alternative fillings is required to be disclosed in an informational brochure to dental

patients hardly justifies eliminating amalgam from further consideration in a content reduction strategy.

Comments on Table 3.3. (pp.13-14):

- In general, the results in the table under the Priority column are not supported by a consistent application of the criteria discussed on the previous pages.
- The table fails to include thermostats for residential and commercial use or, alternatively, mislabels the thermostat category as only including manufacturing and industrial thermostats.
- What alternatives have been identified for fluorescent lamps, HIDs and other lamps? Following the listed criteria, these product categories should have been identified as a priority.
- Consistent application of the criteria should have resulted in dental amalgam being listed as a priority.
- The label Total Mercury Use is unclear even with the explanatory footnote. Does this figure only include new mercury added to products manufactured in 2001 or sold in 2001? Does it exclude total mercury in use, i.e. in stock in existing products?
- Which batteries are included in that product category? What alternatives were identified? Why wasn't this product listed as a priority given a consistent application of the criteria?

p.31 Float switches are not used in automobiles.

pp. 71-79 The sources and appendices provide helpful resources in support of the transition to mercury free products.

IV. CONCLUSION

The LCSP report provides a solid basis for prohibiting the sale of most new uses of mercury switches, relays and devices. The proposed DEP strategy needs to be strengthened in several measures before it can meet the Legislature's call for a comprehensive strategy to reduce the mercury content of products.

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