Report to
The Vermont Legislature

Lead Poisoning Prevention: Report on 2021 Program Outcomes and Activities

In Accordance with 18 V.S.A. § 1756

Submitted to: **Vermont General Assembly**

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Executive Summary

This annual report on the status of childhood lead poisoning prevention is submitted pursuant to 18 V.S.A. § 1756.

The mission of the Vermont Department of Health's Healthy Homes Lead Poisoning Prevention Program (Program) is to improve the health and safety of all Vermont home environments through surveillance, collaboration, education, and implementation of comprehensive policies and coordinated programmatic activities. The Program conducts a variety of lead education and outreach activities that are intended for multiple audiences and designed to prevent lead poisoning, encourage lead screening of 1- and 2-year-olds, and support case management for children with elevated blood lead levels. Last year the State updated the definition of an elevated blood lead result from 5 micrograms per deciliter (µg/dL) to any reported level of this harmful toxicant. However, this report will define an elevated blood lead level as 5 µg/dL and greater, since we do not yet have a full year of data at the new level.

Vermont's progress increasing the percentage of children tested each year has been mixed. After holding steady at ~ 80% since 2006, the percentage of 1-year-olds tested each year declined steadily from 82% in 2014 to 69% in 2021 with the most significant decreases in 2020 and 2021. The percentage of 2-year-olds tested significantly increased from 2006 (44%) to 2014 (72%) and held steady until a sharp decline during the COVID-19 pandemic in 2020 that continued into 2021. The percentage of 2-year-olds tested decreased from 72% in 2019 to 62% in 2021. The declines seen in 2021 are likely the result of a LeadCare II analyzer test kit recall, as well as the disruption from the COVID-19 pandemic.

The number of children with blood lead levels at or above 5 micrograms per deciliter (µg/dL) has declined. From 2006 through 2021, the percentage of 1- and 2-year-olds with blood lead levels greater than or equal to 5 µg/dL declined significantly (1-year-olds from 19.4% to 4.6%, and 2-year-olds from 22.5% to 3.9%). In 2021, the number of 1- and 2-year-olds in Vermont who had a blood lead level greater than or equal to 5 µg/dL were 184 and 143, respectively. In total, 387 children under the age of 6 had a blood lead level greater than or equal to 5 µg/dL, lower than the 400 reported in 2020. The fewer number of children who had elevated lead levels is likely due, in part, to the reduced number of children getting tested.

In 2022, the Program has prioritized the following activities: continuing work with the U.S. Department of Housing and Urban Development (HUD)-funded partners to reduce lead hazards in the homes of lower-income families; increasing Vermont lead law compliance among rental property owners; working with Vermont Child Health Improvement Program (VCHIP) to improve screening rates among health care professionals; and conducting educational outreach to parents of young children, emphasizing the importance of lead screening.

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Introduction

The Vermont Department of Health submits this report on the status of childhood lead poisoning prevention efforts in 2021 pursuant to 18 VSA § 1756. This annual report documents the Department's efforts over the past year to prevent lead poisoning in young children. It presents the latest data on the number and percentage of Vermont children younger than 6 years old who have been tested for lead, with a particular focus on 1- and 2-year-olds. Historical data on screening rates are also presented. In addition, the report describes 2021 outreach and educational activities intended to improve screening rates and provide estimates of the annual public and private costs incurred in 2021 to prevent lead poisoning.

In 2021, the Healthy Homes Lead Poisoning Prevention Program (Program) continued the cooperative agreement with the Centers for Disease Control and Prevention (CDC) for lead poisoning prevention. This funding supports the Program's efforts to improve the health and safety of all Vermont home environments through surveillance, collaboration, education, and implementation of comprehensive policies and coordinated programmatic activities. However, staff were reassigned to Vermont's COVID-19 response for part of the year. Therefore, only essential work, such as case management of children with elevated blood lead levels, environmental investigations, and data surveillance, continued during most of the year.

Measuring Progress

Testing young children for lead in blood is a critical step in the process of reducing the incidence of elevated blood lead levels. Generally, a child's exposure to lead can easily be identified through testing and appropriate interventions can be initiated to prevent further exposure to this harmful toxicant. In addition, testing helps inform the development of lead poisoning prevention policies by giving the Department the opportunity to track statewide trends in childhood exposure to lead. The Program's goal of universal testing of 1- and 2-year-olds in Vermont is required per 18 V.S.A. § 1755.

While the State's definition of an elevated blood lead result is any reported level, the level at which the Health Department contacts the family to help find lead hazards is currently 5 micrograms per deciliter (µg/dL). The Program is in the process of updating Vermont's pediatric blood lead testing and treatment guidelines to be in line with our current definition of an elevated blood lead level. Lowering the level means that more children could be identified as having lead exposure, allowing parents, doctors, public health officials, and communities to act earlier to reduce the child's future exposure to lead.

Table 1 presents 2021 data on the number of young children who were tested for lead and the results of those screenings.

Table 1

Blood Lead Tests and Results for Vermont Children ages 0 - 5 years, 2021*

Age	Population	# of Tests	% Tested	# < 5 µg/dL	% < 5 µg/dL	# 5-9 µg/dL	% 5-9 µg/dL	# ≥10 µg/dL	% ≥10 µg/dL
Under 1	5,682	55	1.0%	48	87.3%	*	*	*	*
1	5,746	3,970	69.1%	3,786	95.4%	137	3.5%	47	1.2%
2	5,959	3,663	61.5%	3,520	96.1%	115	3.1%	28	0.8%
3	6,069	337	5.6%	312	92.6%	16	4.7%	9	2.7%
4	6,130	142	2.3%	124	87.3%	13	9.2%	*	*
5	6,157	96	1.6%	86	89.6%	*	*	*	*
Total	35,743	8,263	23.1%	7,876	95.3%	292	3.5%	95	1.1%

Notes:

* Indicates fewer than eight cases in a category that year. When counts and percentages are based on a small number of cases, it is impossible to distinguish random fluctuation from true changes in data.
Ages: < 1 year: <11 months, 1 year: 11-22.99 months, 2 years: 23-34.99 months, 3 years: 35-46.99 months, 4 years: 47-58.99 months, 5 years: 59-70.99 months.
Population is the average of census estimates or counts from the three previous years of data available (2017, 2018, 2019). Census data for 2020 were unavailable at the time of publication.
Data include one blood lead test per child by age: the highest venous test result or if there is no venous test, then the capillary test result. This may result in a child having two tests per calendar year. For example, a child may be born in December 2019, have their 1-year old test in January 2021, and then have their 2-year old test in December 2021.

Figure 1

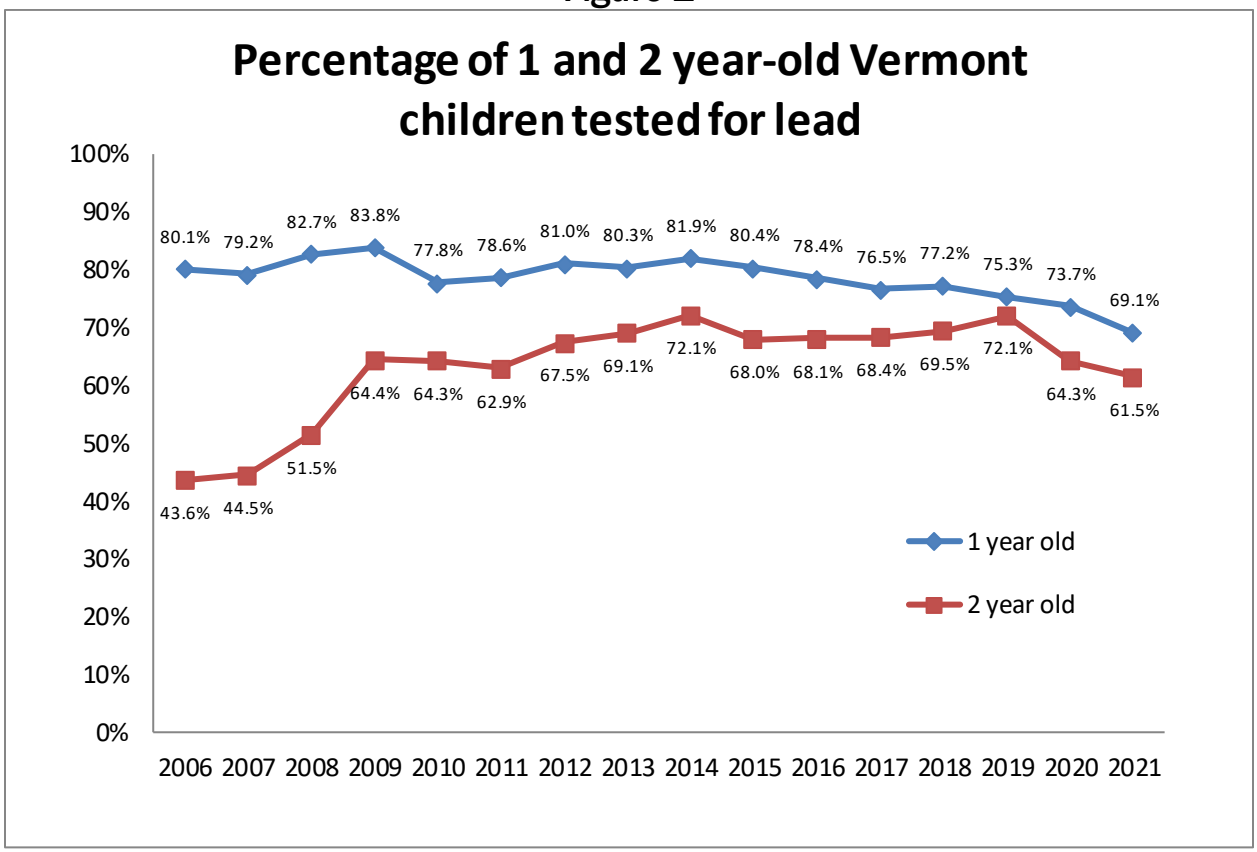

Figure 1 shows the percentage of 1-year-olds and the percentage of 2-year-olds tested each year from 2006 through 2021. After holding steady at ~ 80% since 2006, the percentage of 1-year-olds tested each year declined steadily from 2014 (81.9%, 95% confidence interval (CI)[81.0, 82.9]) to 2021 (69.1%, 95% CI [67.9, 70.3]). While the percentage of 2-year-olds tested significantly increased from 2006 to 2014, there was a sharp decline in 2020 that continued in 2021, from 72.1%, 95% CI (70.9, 73.2] in 2019 to 61.5%, 95% CI [60.2, 62.7] in 2021. The declines seen in 2021 are likely the result of a LeadCare II test kit recall during the final six months of 2021, as well as the disruption from the COVID-19 pandemic.

Figure 2

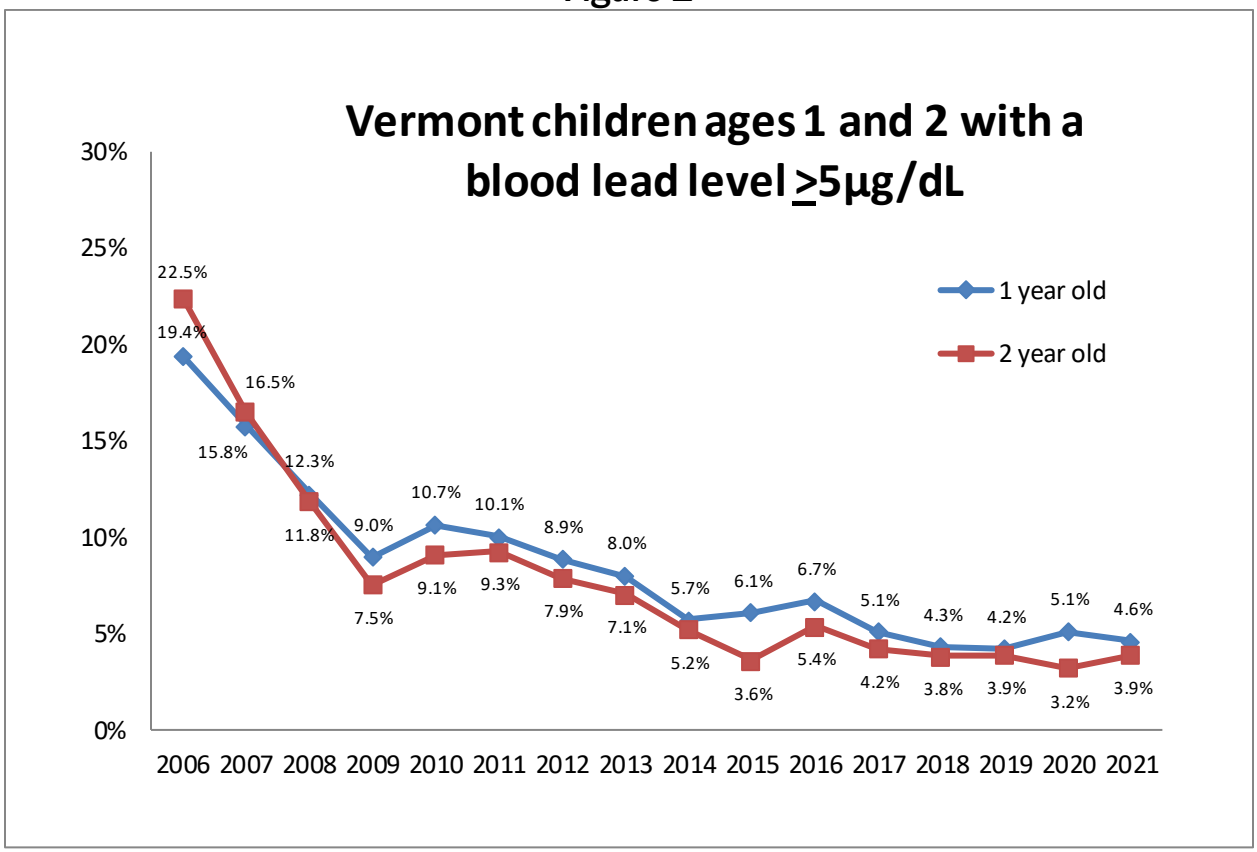

Figure 2 shows the percentage of Vermont 1- and 2-year-olds tested who had blood lead levels greater than or equal to 5 µg/dL during the period from 2006 through 2021. This trend shows a decrease in the percentage of 1- and 2-year-olds who had blood lead levels greater than or equal to 5 µg/dL.

Barriers to Universal Screening

Lead screening of 1- and 2-year-olds is a nationally recognized standard of pediatric care, and Vermont's universal testing requirement is consistent with this standard. There are no immediate signs or symptoms of lead poisoning, so testing is the only way to know if a child has been exposed to lead.

The biggest barrier to testing in 2021 was the recall of the test kits for the LeadCare II analyzer (the recall started in July 2021 and was not resolved until February 2022). About two-thirds of 1- and 2- year-olds in Vermont are tested using a LeadCare II analyzer, which is an in-office blood lead testing device. The recall of these test kits that are required to be used with the LeadCare II analyzers left many practices without a quick and easy way to screen their pediatric population for lead. The Vermont Department of Health Laboratory (VDHL) offered to provide free lead testing services and lead testing supplies to those practices impacted. Some practices made the shift to the VDHL or the University of Vermont Medical Center Lab which enabled them to continue to screen for lead in the office during a well child visit. Other practices delayed in finding alternative testing options, and some practices sent families for a venous blood draw at a local hospital laboratory. Blood lead collection can be done via a capillary sample (finger or heel

prick) or a venous sample (needle inserted into a vein). A venous sample is typically collected at a local hospital laboratory and is more invasive than a capillary test, which can be a deterrent to timely lead testing.

Another barrier to lead testing in 2021 was the absence of in-person WIC clinics. Vermont's local health offices continued to operate WIC clinics virtually in 2021 due to the COVID-19 pandemic. Local health offices were therefore not able to provide back-up lead screening for children not tested by their health care professionals.

2021 Education and Outreach Activities

Outreach and support for health care professionals and education to the public is an integral part of the Program's work. The Program conducts a variety of lead education and outreach activities intended for families with young children and healthcare providers and designed to prevent lead poisoning, encourage lead screening of 1- and 2-year-olds, and support case management for children with high blood lead levels. For some of 2021, staff were reassigned to Vermont's COVID-19 response, limiting the amount of outreach we were able to accomplish. Listed below is a sample of activities organized by the Program in 2021.

Programmatic Activities and Outreach

- Conducted limited outreach during Lead Poisoning Prevention Week (October 24-30, 2021) using the *How Would You Know?* campaign materials and Halloween-themed poster and video on our social media channels.
- Referred families to HUD-funded partners (Vermont Housing Conservation Board and Burlington Lead Program) to reduce lead hazards in the homes of lower-income families.
- Worked with families that were ineligible for the HUD program to provide access to paint and cleaning supplies.

Targeted Education

- Provided 97 environmental investigations, educational home (and virtual) visits, and follow-ups for families of children with venous blood lead levels of 5 µg/dL or greater.
- Mailed 9,736 postcards to families with 10-month-old children and 22-month-old children who were born in Vermont reminding them to have their children tested for lead.
- Mailed 237 packets to families whose children had a capillary blood lead level from 5 µg/dL to 9 µg/dL that included educational materials and follow-up testing recommendations.
- Mailed 57 packets to families whose children had a capillary blood lead level of 10 µg/dL or higher that included educational materials and follow-up testing recommendations.
- Mailed educational materials to approximately 1,800 new rental housing building owners to alert them of the Vermont and federal lead-based paint regulations and to increase their awareness of the possible hazards associated with lead-based paint in older buildings.

Screening Outreach

- Continued a project in partnership with the VCHIP to offer peer-to-peer support and solutions to practices with low testing rates. The goals of the project are to promote proper adherence to the blood lead screening guidelines, help practices achieve high screening rates, and improve reporting rates of lead screening results.
- Continued to work with the Vermont Chapter of American Academy of Pediatrics under a grant to provide the purchase of LeadCare II machines for selected pediatric and family practices. The grant supports the purchase of the machines and peer-to-peer education and training with the goal of further reducing known barriers to blood lead screening. This project has been on hold since September because of the LeadCare II test kits recall.
- Since March 2020, Vermont's local health offices operated WIC clinics virtually, and therefore no longer provided a back-up testing option (to that offered by pediatricians) at 18- and 30-month WIC appointments. They do, however, remind parents on the importance of getting their children tested for lead.

Planned Activities and Recommendations

In 2022, the Program will continue with efforts to reduce lead poisoning by making homes safer for children and increasing blood lead testing rates for 1- and 2-year-olds. This will be achieved through educating parents, providing technical assistance to health care professionals, and enforcing the lead testing rules. Specific activities for the Program in 2022 include:

- Collaborate with Department's Asbestos and Lead Regulatory Program to educate rental property owners and childcare facilities on the requirements of the Vermont regulations pertaining to lead exposure.
- Update and disseminate Vermont's pediatric blood lead testing and treatment guidelines to allow for earlier identification and response to lead exposure and remind health care professionals that there's no safe level of lead.
- Send a Health Alert Network (HAN) to health care professionals about the updated guidelines and the importance of lead testing, especially considering the decrease in testing during the pandemic and Lead Care II test kit recall.
- Analyze lead screening data in an effort to identify other reasons why rates may be low.
- Conduct another round of How Would You Know?, a social marketing campaign intended for parents and caregivers of children under 2 years of age to raise awareness about lead poisoning and testing for their children and to increase testing rates.
- Identify health care practices with low testing rates of 1- and 2-year-olds and consult with them directly to understand why.
- Evaluate effectiveness of outreach messages.
- Continue to provide outreach, conduct environmental investigations, and provide case management to families with children that have confirmed elevated blood lead levels.
- Continue to send reminder postcards with lead testing information to all families whose children were born in Vermont and are ages 10 and 22 months.

- Create and disseminate annual practice reports on blood lead testing for all medical practices in Vermont who have 20 or more 1- and 2-year-old patients. The goal is to encourage required testing among health care professionals by reporting practice-specific testing rates and providing education and guidance about blood lead testing.

- Continue working with Vermont Child Health improvement Project (VCHIP) to initiate more specific individualized opportunities to provide outreach and train health care professionals on the importance of screening and reporting of results.
- Work with VCHIP to provide lead testing expertise to the Child Health Advances Measured in Practice (CHAMP) Network providers via the CHAMP Learning Session, dissemination of fact sheets and reports, and additional webinars.
- Compile a comprehensive data report with lead poisoning, screening, case management, and housing information that includes geographic information system (GIS) maps featuring areas of elevated blood lead levels, older housing stock, and low-income status.
- Work with Lead Care II users to improve the accuracy and timeliness of lead test reporting.
- Maintain and expand partnerships with internal and external partners, such as:
    - Vermont Housing and Conservation Board
    - Burlington Lead Program
    - Vermont Child Health Improvement Program
    - Environmental Public Health Tracking Program
    - Asthma Program
    - Asbestos and Lead Regulatory Program

Estimates of Public and Private Costs

In the public sector, the Program expended an estimated $361,598 in fiscal year 2021. The Vermont Housing and Conservation Board expended $893,864 from HUD for lead poisoning prevention, and the Burlington Lead Program spent an estimated $423,068 in HUD Lead Hazard Control funds. Combined, these organizations spent an estimated $1,678,529 in federal and state funds to reduce lead poisoning in 2021. This amount is similar to 2020 but down almost one million dollars from fiscal year 2019 ($2,528,442).

A study completed by Dartmouth College as part of the *Get the Lead Out of Vermont* Task Force Report in 2006 estimated direct health care costs of all children with elevated blood lead levels at $51,814 per year and special education costs at $219,841 per year (considered to be an underestimate because they were calculated only for those children with blood lead levels 25 µg/dL or greater).[1] The report also estimated lost future earnings at more than $79 million per year for Vermont children (calculated in 2006 and for children with blood lead levels 5 µg/dL or greater). Screening costs incurred by families, insurers, and health care professionals are not represented in these cost estimates.

Another study on the social and economic benefits of lead hazard control estimated a return of $17 to $221 for every dollar spent on lead hazard control.[2] This would suggest that for the $1,678,529 spent in 2021 on reducing lead hazards and preventing poisoning, the State of Vermont could see a return on investment (ROI) of between $28,535,000 to $370,955,004. This

estimate takes into account the costs of lead hazard control, reduced health care costs, lifetime earnings, tax revenue, special education costs, behavioral disorders, and crime.

The Pew Center on the States released an issue brief, *Cutting Lead Poisoning and Public Costs*, in 2010.[3] Their research indicated that despite dramatic improvements over the past 30 years, lead poisoning remains a serious hazard for hundreds of thousands of young children in the United States. They concluded that returns on large-scale lead abatement efforts would yield at least $17 for each dollar invested, which translates to a net benefit of $181 to $269 billion. These benefits would be observed in reduced health care utilization, reduced IQ loss, decreased special education needs, higher earnings, and fewer behavior problems and crime.

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[1]Carlson, C., Y. Feng, D. McClurg, and J. Trummel. "The Costs of Lead Poisoning in Vermont." Dartmouth Center for Evaluative Clinical Sciences (CECS) (2006): 1-27. https://ago.vermont.gov/wp-content/uploads/2018/03/The-Cost-of-Lead-Poisoning-in-Vermont.pdf

[2]Gould, E. (2009, July). Childhood lead poisoning: Conservative estimates of the social and economic benefits of lead hazard control. Environmental Health Perspectives, 117(7), 1162-1167. Retrieved February 21, 2017, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2717145/

[3]The Pew Center on the States. 2010. Cutting Lead Poisoning and Public Costs. *Partnership for America's Economic Success*, Issue Brief #14. http://www.pewtrusts.org/~/media/assets/2010/02/22/063_10_paes-costs-of-lead-poisoning-brief_web.pdf

Appendix: Statute

18 V.S.A. § 1756. Annual report

(a) The Commissioner shall, at least annually, analyze and summarize all aggregate lead screening and testing information provided by physicians, health care facilities, and laboratories and provide this information to all other local and State agencies involved with case management and lead hazard reduction.

(b) The Commissioner shall also at least annually provide to the General Assembly, the health community, and the general public an analysis and summary of such data and a progress report on the Commissioner's efforts to prevent lead poisoning in young children in a format that is easily understandable to nontechnical readers. The report shall include:

(1) The number and percentage of children under the age of six who have been screened and tested for lead poisoning, and the number found to have lead poisoning at various levels.

(2) Estimates of the public and private costs incurred since July 1, 1993 to prevent, correct, or treat lead poisoning.

(3) An analysis of barriers to universal blood screening of children under the age of six years.

(4) The Commissioner's recommendations for action. (Added 1993, No. 94, § 3.)