



Department of the Environment

# Collection of Mercury Switches and Mercury Switch Assemblies from Vehicles

October 1, 2009 – September 30, 2010

Prepared by:

Technical Services and Operations Program  
Land Management Administration

Prepared for:

Senate Education, Health, and Environmental Affairs Committee

House Environmental Matters Committee

Martin O'Malley, Governor  
State of Maryland

Anthony G. Brown, Lt. Governor  
State of Maryland

Thomas V. Mike Miller, Jr., Senate President  
Maryland General Assembly

Michael E. Busch, House Speaker  
Maryland General Assembly

May 2011



MARYLAND DEPARTMENT OF THE ENVIRONMENT  
1800 Washington Boulevard | Baltimore, MD 21230 | [www.mde.state.md.us/recycling](http://www.mde.state.md.us/recycling)  
410-537-3314 | 800-633-6101 x3314 | TTY Users: 800-735-2258  
Martin O'Malley, Governor | Anthony G. Brown, Lt. Governor | Robert M. Summers, Secretary





## **Background**

In its 2009 session, the Maryland General Assembly passed House Bill 1263, concerning mercury switch removal from end-of-life vehicles. This bill became law on July 1, 2009.

The impetus for the law was concern that processing scrap metal from motor vehicles was causing releases of mercury to the environment from mercury-containing switches. The law requires removal of mercury-containing switches from end-of-life vehicles by vehicle recyclers and by scrap processing facilities. Manufacturers of vehicles with mercury switches are required to develop and implement a “mercury minimization plan” that will assist entities required to remove mercury-containing switches from vehicles. The law is found in the following sections of the Environment Article of the Annotated Code of Maryland: Section 6-904 (Findings), Section 6-905 (Definitions), Section 6-905.4 (Mercury minimization plan), Section 6-905.5 (Mercury switches or mercury switch assemblies), and Section 6-905.6 (Violations and penalties).

Section 6-905.5(j) of the Environment Article, Annotated Code of Maryland requires the Maryland Department of the Environment (“Department” or “MDE”) to submit a report to the General Assembly by October 1 of each year on the implementation of the law. The report is to include information on:

1. The number of mercury switches and mercury switch assemblies recovered from vehicles;
2. The capture rate of switch recovery achieved;
3. The number of switches projected to be recovered;
4. The amount and use of funds paid into the State Recycling Trust Fund for the administration of the law; and
5. Any recommendations to improve the provisions of the law or to increase the capture rate of mercury switches from vehicles.

This document is being submitted in fulfillment of the requirement of Section 6-905.5(j) of the Environment Article, Annotated Code of Maryland. This report covers the period from October 1, 2009 through September 30, 2010.

## **Overview of Mercury Switch Collection Program**

Under Maryland law, vehicle manufacturers that sold vehicles in Maryland that contained mercury switches are required to develop a “mercury minimization plan” that will ensure removal and collection of mercury-containing switches from end-of-life vehicles before the vehicles are processed at a scrap processing facility (intentionally flattened, crushed, baled or shredded.) The plan is required to include information on the location of mercury-containing switches in vehicles by make, model, and model year; information on the safe and environmentally responsible removal and handling of mercury-containing switches; a plan for implementing and financing the removal, collection, and recovery of mercury-containing switches; payments to vehicle recyclers for each mercury-containing switch collected in

accordance with the mercury minimization plan, and maintenance of appropriate record keeping systems associated with implementation of the plan.

Vehicle manufacturers that installed mercury-containing switches have established a nationwide collection program for automotive mercury switches. This program is being implemented by the End of Life Vehicle Solutions Corporation (ELVS), an entity created by a consortium of motor vehicle manufacturers. The home page of the ELVS website (<http://www.elvsolutions.org/index.htm>) states that ELVS was created by the automotive industry to promote the industry's "environmental efforts in recyclability, education and outreach, and the proper management of substances of concern."

Automobile manufacturers are relying on the ELVS mercury switch collection program to serve as the core of the Maryland approved "mercury minimization plan" that the manufacturers were required to develop and implement to meet collection obligations under Maryland law. Under the program, ELVS provides vehicle recyclers and scrap processors with specially designed containers for collection, temporary storage, and shipping of mercury switches removed from end-of-life vehicles. Pre-paid shipping is included with containers that are provided to program participants.

ELVS has developed educational materials that identify which vehicles have mercury switches, where the switches are located on the vehicles, and how the switches should be removed. These educational materials are provided to program participants, and are also made available on the ELVS website (<http://www.elvsolutions.org/index.htm>).

Maryland participants are eligible for bounty payments from ELVS of \$4.00 per mercury light switch or mercury light switch assembly and \$6.00 per mercury-containing antilock braking system (ABS) unit, provided the switches are delivered to ELVS in accordance with requirements specified in the program plan. The plan also provides for a payment to the Maryland Department of the Environment of \$1.00 for each mercury switch delivered to ELVS in accordance with the plan.

ELVS submitted its mercury minimization plan for review by MDE on September 27, 2009. On October 27, 2009, ELVS submitted a revised plan that addressed issues arising from the General Motors bankruptcy and reorganization. The Department reviewed the plan and provided ELVS with written comments on October 30, 2009. ELVS provided MDE with a revised plan on November 23, 2009. MDE approved the plan on January 25, 2010.

As of September 20, 2010, ELVS had enrolled 115 participants from Maryland in the collection program. Not all of these are unique entities, however. It appears that for business purposes, some participants are operating under multiple names at the same location. The number of unique participants enrolled includes 86 vehicle recyclers and 11 scrap processing facilities.

## **Report of Required Information**

This section of the report presents information required to be reported to the General Assembly by Section 6-905.5(j) of the Environment Article, Annotated Code of Maryland. The information is presented in the order it specified in Section 6-905.5(j).

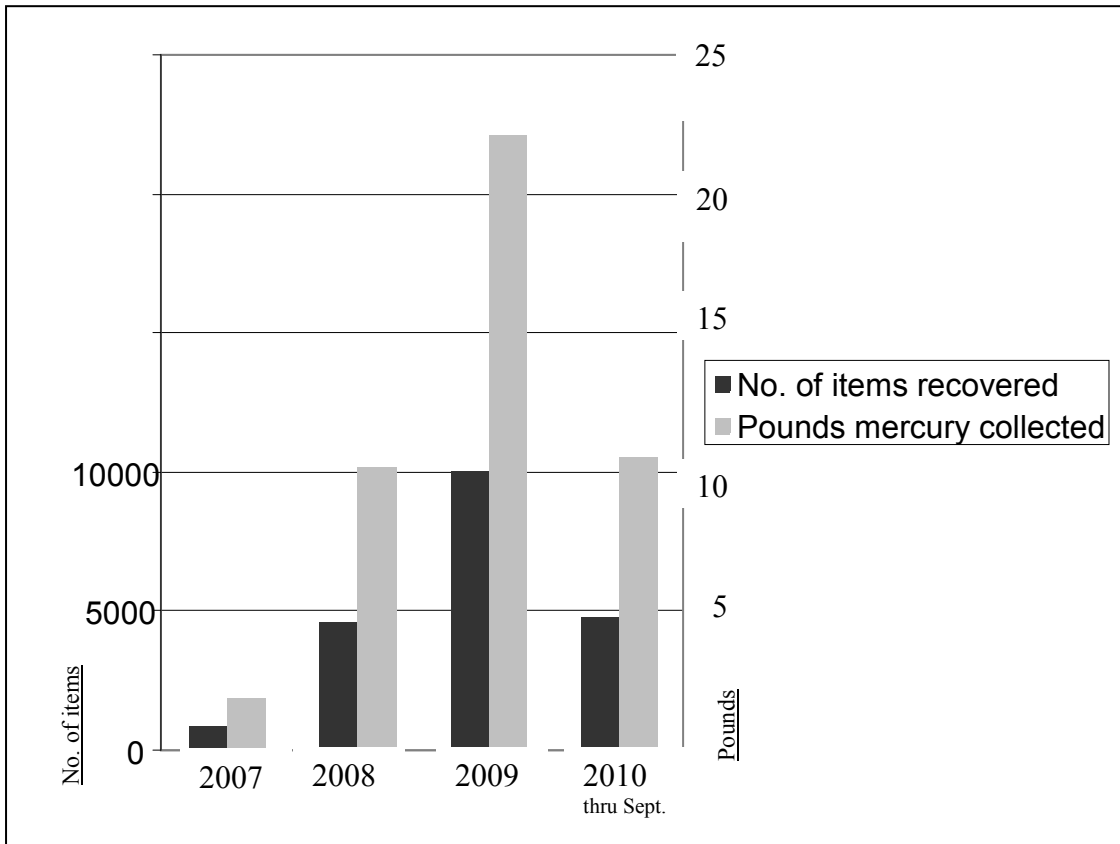
- Number of mercury switches and mercury switch assemblies recovered from vehicles:

During the period covered by this report (October 1, 2009 – September 30, 2010), a total of 6,494 mercury switches, yielding 14.32 pounds of mercury, were delivered to the ELVS recycling contractor from Maryland vehicle recyclers and scrap processing facilities. During calendar year 2010 (through September 30), a total of 4,802 mercury switches, yielding 10.56 pounds of mercury, were delivered to the ELVS recycling contractor from Maryland. 10,052 mercury switches, yielding 22.11 pounds of mercury, were delivered to the ELVS recycling contractor from Maryland during the entire 2009 calendar year. Note that there is a lag between the time that participants remove switches from vehicles and the time that the switches are submitted to ELVS because of the time that it takes to accumulate enough switches to fill the collection/shipping container.

Data from 2007 – 2010 is presented in the following table and chart:

Year	Number of Switches Collected	Pounds of Mercury
2010*	4,802	10.56
2009	10,052	22.11
2008	4,625	10.18
2007	860	1.89

(\*2010 data for period January 1 – September 30)



Month-by-month data on the number of switches turned in to ELVS during the period covered by this report is given in the following table:

<u>Month</u>	<u>No. of Switches</u>
Oct-09	412
Nov-09	39
Dec-09	1241
Jan-10	1760
Feb-10	941
Mar-10	151
Apr-10	328
May-10	418
Jun-10	90
Jul-10	840
Aug-10	274
Sep-10	0

- Capture rate of switch recovery achieved:

ELVS uses the Switch Retirement Model developed by the National Vehicle Mercury Switch Recovery Program (NVMSRP) Measurement Committee to identify switch populations and estimate mercury switch retirement rates through 2017. The NVMSRP was developed through a collaborative effort involving the U.S. Environmental Protection Agency, states, environmental organizations, and several industry sectors.

More information on the NVMSRP is available at <http://www.epa.gov/mercury/switchfs.htm>.

The Switch Retirement Model uses historic information on vehicle sales by state, estimates of vehicle scrappage rates as a function of vehicle age, and information on the average number of mercury switches per vehicle to estimate the number of switches expected to be in vehicles scrapped each year, by state.

The model estimates the total number of mercury switches installed in vehicles manufactured before automobile model year 2003 to be 169,185,000 in vehicles sold in the United States. (The 2002 model year was the last year that mercury switches were installed in vehicles.) Most of the vehicles containing these switches have already been taken out of service. The model estimates that there are 18,339,000 mercury switches nationally in vehicles that will be taken out of service from 2011 through 2017. The number of mercury switches that will be available for collection from vehicles that will be taken out of service in Maryland from 2011 through 2017 is estimated at 263,000. The model estimates that 51,000 mercury switches were available for collection from vehicles taken out of service in Maryland in 2010.

The following table presents detailed estimates for switches available for recovery, by year, as estimated by the Switch Retirement Model:

MD

Year Model	Scrappage Rate	# Switches										
		in operation as of 7/06	# Scrapped 2007	2007 Switches In Operation	2008 # Scrapped	2008 Switches In Operation	2009 # Scrapped	2009 Switches In Operation	2010 # Scrapped	2010 Switches In Operation	2011 # Scrapped	2011 Switches In Operation
1973 & OLDER	20.2	21,818	4,407	17,411								
1974	20.2	2,485	502	1,983	3,918	15,476						
1975	20.2	2,328	470	1,858	375	1,482	3,426	13,533				
1976	20.2	3,541	715	2,826	571	2,255	455	1,799	3,097	12,235		
1977	20.2	5,058	1,022	4,036	815	3,221	651	2,570	519	2,051	2,886	11,400
1978	19.3	6,318	1,219	5,098	1,030	4,068	822	3,247	656	2,591	523	2,067
1979	18.5	7,687	1,422	6,265	1,209	5,056	1,021	4,034	815	3,219	650	2,569
1980	17.7	4,186	741	3,445	637	2,807	542	2,266	458	1,808	365	1,443
1981	16.9	4,465	755	3,711	657	3,054	565	2,489	480	2,009	406	1,603
1982	16.1	5,205	838	4,367	738	3,629	642	2,987	553	2,434	470	1,964
1983	15.2	8,546	1,299	7,247	1,167	6,080	1,028	5,052	894	4,158	769	3,389
1984	14.5	15,242	2,210	13,032	1,981	11,051	1,779	9,272	1,567	7,705	1,364	6,341
1985	13.6	20,847	2,835	18,012	2,612	15,400	2,341	13,059	2,103	10,957	1,852	9,105
1986	12.9	34,873	4,499	30,375	4,131	26,244	3,805	22,438	3,411	19,028	3,063	15,964
1987	12.1	32,462	3,928	28,534	3,681	24,853	3,380	21,473	3,114	18,359	2,791	15,569
1988	11.4	41,449	4,725	36,724	4,444	32,280	4,164	28,116	3,824	24,292	3,522	20,770
1989	10.6	56,526	5,992	50,534	5,761	44,773	5,418	39,356	5,077	34,279	4,662	29,617
1990	9.9	46,336	4,587	41,749	4,425	37,323	4,255	33,069	4,001	29,067	3,750	25,318
1991	9.2	48,654	4,476	44,177	4,374	39,804	4,219	35,585	4,057	31,528	3,815	27,713
1992	8.5	42,356	3,600	38,756	3,566	35,190	3,484	31,706	3,361	28,345	3,231	25,114
1993	7.8	53,606	4,181	49,425	4,201	45,224	4,161	41,063	4,065	36,998	3,922	33,076
1994	7.3	66,074	4,823	61,250	4,778	56,473	4,800	51,672	4,754	46,919	4,645	42,274
1995	5.6	47,409	2,655	44,754	3,267	41,487	3,236	38,251	3,251	35,000	3,220	31,780
1996	4.6	38,912	1,790	37,122	2,079	35,044	2,558	32,485	2,534	29,952	2,546	27,406
1997	3.4	13,580	462	13,118	603	12,514	701	11,814	862	10,951	854	10,097
1998	3.1	14,115	438	13,678	465	13,213	608	12,605	706	11,899	869	11,031
1999	2.5	22,655	566	22,089	685	21,404	728	20,676	951	19,725	1,105	18,620
2000	2.3	8,317	191	8,125	203	7,922	246	7,677	261	7,416	341	7,075
2001	1.8	9,551	172	9,379	216	9,163	229	8,934	277	8,657	294	8,363
2002	1.7	29,114	495	28,619	515	28,104	646	27,458	686	26,771	830	25,942
Total		713,713	66,016	647,697	63,102	584,595	59,909	524,687	56,333	468,354	52,745	415,609

Note: Switches available for collection estimated by subtracting inaccessible switches due to vehicle damage, end of life vehicle exports, and lost or stolen vehicles which do not enter the recycling stream from total switches.

**Switches  
Newly  
Available  
in MD for  
Collection:**

**61,000**

**51,000**

**51,000**

**51,000**

**48,000**



<u>Year</u> <u>Model</u>	<u>Scrapage</u> <u>Rate</u>	2012 <u># Scrapped</u>	2012 <u>Switches</u> <u>In Operation</u>	2013 <u># Scrapped</u>	2013 <u>Switches</u> <u>In</u> <u>Operation</u>	2014 <u>#</u> <u>Scrapped</u>	2014 <u>Switches</u> <u>In</u> <u>Operation</u>	2015 <u>#</u> <u>Scrapped</u>	2015 <u>Switches</u> <u>In</u> <u>Operation</u>	2016 <u>#</u> <u>Scrapped</u>	2016 <u>Switches</u> <u>In</u> <u>Operation</u>	2017 <u>#</u> <u>Scrapped</u>	2017 <u>Switches</u> <u>In Operation</u>
1973 & OLDER	20.2												
1974	20.2												
1975	20.2												
1976	20.2												
1977	20.2												
1978	19.3	2,721	10,747										
1979	18.5	519	2,050	2,585	10,212								
1980	17.7	291	1,151	233	919	2,249	8,883						
1981	16.9	324	1,279	258	1,021	206	815	1,959	7,738				
1982	16.1	397	1,568	317	1,251	253	998	202	797	1,724	6,811		
1983	15.2	654	2,735	552	2,182	441	1,742	352	1,390	281	1,109	1,600	6,320
1984	14.5	1,173	5,168	997	4,170	842	3,328	672	2,656	536	2,119	428	1,691
1985	13.6	1,612	7,494	1,386	6,107	1,179	4,929	996	3,933	794	3,139	634	2,505
1986	12.9	2,698	13,266	2,348	10,918	2,020	8,898	1,717	7,181	1,451	5,730	1,158	4,573
1987	12.1	2,507	13,062	2,208	10,855	1,921	8,933	1,653	7,281	1,405	5,876	1,187	4,689
1988	11.4	3,157	17,613	2,836	14,777	2,497	12,280	2,174	10,106	1,870	8,237	1,590	6,647
1989	10.6	4,294	25,323	3,849	21,473	3,457	18,016	3,045	14,972	2,650	12,322	2,279	10,042
1990	9.9	3,443	21,874	3,172	18,703	2,843	15,860	2,553	13,306	2,249	11,058	1,957	9,100
1991	9.2	3,575	24,138	3,283	20,855	3,024	17,831	2,710	15,121	2,434	12,686	2,144	10,542
1992	8.5	3,039	22,075	2,848	19,227	2,615	16,613	2,409	14,204	2,159	12,045	1,939	10,106
1993	7.8	3,771	29,305	3,546	25,759	3,323	22,436	3,051	19,385	2,811	16,574	2,519	14,055
1994	7.3	4,481	37,793	4,308	33,484	4,052	29,433	3,797	25,636	3,486	22,149	3,212	18,938
1995	5.6	3,146	28,634	3,035	25,598	2,918	22,680	2,744	19,936	2,572	17,364	2,362	15,003
1996	4.6	2,521	24,884	2,464	22,421	2,377	20,044	2,285	17,759	2,149	15,610	2,014	13,597
1997	3.4	858	9,239	850	8,389	830	7,558	801	6,757	770	5,987	724	5,262
1998	3.1	860	10,170	864	9,306	856	8,450	837	7,613	807	6,806	776	6,030
1999	2.5	1,359	17,261	1,346	15,915	1,353	14,562	1,340	13,222	1,309	11,913	1,263	10,651
2000	2.3	396	6,678	488	6,191	483	5,708	485	5,223	481	4,742	469	4,273
2001	1.8	385	7,978	447	7,532	550	6,982	545	6,437	547	5,890	542	5,348
2002	1.7	882	25,060	1,153	23,907	1,339	22,568	1,647	20,921	1,632	19,289	1,640	17,649
Total		49,063	366,546	45,372	321,173	41,627	279,546	37,973	241,573	34,117	207,456	30,436	177,020

**Switches  
Newly  
Available  
in MD for  
Collection:**

**44,000**

**41,000**

**38,000**

**34,000**

**31,000**

**27,000**

The capture rate (CR) in Maryland for January 1 through September 30, 2010 is calculated as:

CR = (Number of switches turned in) divided by (number of switches available)

Number of switches available from January 1 – September 30, 2010 = 51,000 x (9/12) = 38,250

Therefore, the capture rate = 4,802/38,250 = 0.1255, or 13%.

The capture rate for the period October 1, 2009 through September 30, 2010 is estimated as (6,494/51,000) = 0.1273, or 13%.

The capture rate for calendar year 2009 is estimated as (10,052/51,000) = 0.1971, or 20%

These calculations underestimate the true capture rates, because switches are not counted as being removed until they are turned-in to the ELVS contractor. As mentioned above, there can be a significant lag time before a switch that has been removed is turned in for recycling. Also, economic concerns related to the recession may have reduced the number of switches available as vehicle owners keep vehicles in operation longer. There may be some uncertainty in the model's estimate of the number of switches available because the model assumes that a vehicle that was purchased in Maryland will be scrapped in Maryland. That does not take into account such factors as vehicles being taken out of state by persons who relocate, and trade-in vehicles being sent out of state by new car dealers. However, this could be happening in other states as well, resulting in vehicles originally purchased elsewhere being scrapped in Maryland.

- Number of switches projected to be recovered:

The National Vehicle Mercury Switch Recovery Program (NVMSRP) Switch Retirement Model, available at

<[http://www.elvsolutions.org/NVMSRP\\_Switch\\_Retirement\\_Model\\_V2\\_Feb\\_10.xls](http://www.elvsolutions.org/NVMSRP_Switch_Retirement_Model_V2_Feb_10.xls)> provides the following estimates for number of end-of-life vehicle mercury switches available in Maryland through 2017:

<b>Year</b>	<b>Estimated # Switches in Vehicles Scrapped in MD</b>
2007	61,000
2008	51,000
2009	51,000

2010	51,000
2011	48,000
2012	44,000
2013	41,000
2014	38,000
2015	34,000
2016	31,000
2017	<u>27,000</u>
Total	477,000

- Amount and use of funds paid into the State Recycling Trust Fund:

As of August 27, 2010, MDE had been paid \$1,381 by ELVS. ELVS is only paying the State \$1 per switch as required under the statute when ELVS has received the proper paperwork completed by program participants, as stated in the manufacturers’ mercury minimization plan. The switch recovery plan MDE approved includes the statement “ELVS will further authorize the payment of \$1 for each *form verified*(emphasis added) mercury convenience light switch or mercury containing ABS assembly to the Maryland Department of the Environment.”

The limited funds received are being applied toward program staff costs and outreach activities. These include mailings to auto recycling facilities, and staff contacts by phone and in person with affected facilities. In State fiscal year 2010, \$62,026.31 was charged against the State Recycling Trust Fund as partial compensation for expenditures made for these purposes. Details on these expenditures are provided in the following financial statement.

**RECYCLING TRUST FUND  
MERCURY AUTO SWITCH**

FINANCIAL STATEMENT  
July 1, 2009 to June 30, 2010

A. Beginning Fund Balance 7/01/09 \$ 0.00

B. FY 2010 Receipts

Mercury Auto Switches \$ 0.00

C. Total Funds available FY 2010 (A+B) \$ 0.00

FY 2010 Expenditures

D.

Salaries and Wages	-\$54,441.28
Technical and Special Fees	0
Communications	- \$81.84
Travel	0
Utilities	0
Motor Vehicle Operations and Maintenance	0
Contractual Services	0
Supplies and Materials	- \$154.52
Equipment	0
Grants	0
Fixed Charges	0
<b>Total Expenditures</b>	<b>- \$54,677.64</b>

E. Indirect Costs - \$7,348.67

F. Balance in Fund 07/01/2010 - \$62,026.31\*

\*Expenditures covered by other sources in the Recycling Trust Fund.

## **Highlights of MDE Activities**

During the period covered by this report, MDE performed outreach activities to inform vehicle recyclers and scrap processing facilities of their obligations to remove and collect mercury switches from end-of-life vehicles. Outreach activities included direct mailings to members of the auto recycling industry, telephone calls, and site visits.

Separate mailings were made to entities that were already enrolled in the ELVS switch collection program (mailed 1/4/2010), and entities that were thought to be subject to switch removal requirements but had not yet enrolled (mailed 12/30/2009). The letters explained the requirements of Maryland law concerning removal of mercury switches from end-of-life vehicles, and included a “frequently asked questions” document providing additional information on program requirements and implementation. Letters were sent to 103 ELVS enrollees, and 70 non-participants.

During May, 2010 a staff member made site visits to 12 auto recyclers to gather information on program implementation and provide compliance assistance. Since the switch removal requirement was still a relatively new mandate, the visits were not intended to be enforcement inspections. The Department plans to continue conducting site visits, with a goal of visiting 2-3 facilities each month.

The Department has also obtained lists of entities that the Maryland Motor Vehicle Administration (MVA) has licensed as either an Automotive Dismantler and Recycler (ADR) or a Scrap Processor. The Department is using these lists to identify additional entities that may be subject to the switch removal requirements so that the Department can contact them and determine whether they are subject to the switch removal requirements.

Under Maryland law (Section 15-511 of the Transportation Article, Annotated Code of Maryland), there is a requirement that automotive dismantlers and recyclers and scrap processors provide electronic notification to MVA or MVA’s designee when a vehicle has been acquired for dismantling or scrapping. The Department was advised by MVA that the notification information is managed by the Maryland State Police. The Department is attempting to gain access to this information for possible use in evaluating whether persons are meeting their switch removal requirements and is conducting spot checks on automobile recyclers to evaluate whether their inventory of collected switches is consistent with the number of mercury switches in vehicles they are known to have been scrapped.

The Department received the first annual report submitted by ELVS on behalf of vehicle manufacturers on the implementation of the switch collection program in Maryland on January 22, 2010. The report addressed the elements that the statute requires to be discussed, although the report only covered an abbreviated period due to the effective dates within the statute. A copy of the vehicle manufacturers’ report is included as an appendix to this report.

## **Implementation Challenges**

Payment by vehicle manufacturers to the State of \$1 per switch recovered, as mandated in the statute, is a concern because the manufacturers are only making payments for switches accompanied by ELVS-required paperwork that is completely filled out. As a result, the State received \$1,381 in payment from January 1, 2010 through August 27, 2010 instead of the full payment of \$4,764 that would be associated with the number of eligible switches reported by ELVS as recovered by Maryland program participants over the period of January 1, 2010 through August 31, 2010. The number of eligible switches equals the total number of switches recovered (4,802) minus 38 airbag sensor switches recovered. (The Maryland statute does not require payment for recovered airbag switches.) Some program participants may not consider the burden of filling out the ELVS paperwork worth the bounty of \$4 or \$6 per switch that ELVS will reimburse for properly documented switches. Also, since the switch bounty is considered income for tax purposes, some participants are forgoing the bounty so as not to further complicate their tax filings.

An observation from site visits was that participants are frequently slow about turning in switches they have collected. Additional outreach efforts will be needed to encourage the timely shipment of switches once the collection buckets are approaching “full”.

The electronic record keeping requirement of the statute may be difficult for some affected facilities to comply with. While many of the auto recycling operations are large with sophisticated inventory control, others are small operations with limited computer capability.

There has been a problem with program participants turning in ineligible switches. Reports on switch collection submitted by ELVS to the Department typically show 3-10% of switches submitted by individual participants as failing validation checks. (Some participants achieve a 0% rejection rate.)

## **Future Activities**

The Department will continue outreach activities, concentrating on making sure that all parties subject to the mercury switch removal requirement are aware of the law and what they need to do to maintain compliance. The highest priority will be to ensure that all vehicle recyclers and scrap processing facilities that manage end-of-life vehicles are enrolled with ELVS and understand their obligations. Site visits will continue, both as an information gathering tool, and a means of providing compliance assistance.

## APPENDIX

### 2009 Manufacturers' Implementation Report

ELVS end of life vehicle solutions

P.O. BOX 3282  
Farmington Hills, MI. 48333-3292

January 15, 2010

Ms. Hilary Miller  
Program Manager  
Technical Services and Operations Program  
Land Management Administration  
Maryland Department of the Environment  
1800 Washington Boulevard - Suite 610  
Baltimore, MD 21230-1719



Subject: End-of-Life Vehicle Solutions Corporation "Manufacturer's Annual Implementation Report"

Dear Ms. Miller,

The Annotated Code of Maryland Section 6-905.5(G) Mercury Switch Removal from Vehicles, Chapter 713 requires vehicle manufacturers to report annually to the Maryland Department of the Environment on the progress of their mercury minimization plan including:

- the number of mercury switches collected
- a description of the capture rate achieved
- a description of actions that may be implemented to improve the plan if a capture rate of at least 90% for the previous calendar year is not achieved
- the number of end-of-life vehicles containing mercury switches
- a description of how the mercury switches were managed
- a description of the costs of implementing the program

This report is provided by End of Life Vehicle Solutions Corporation on behalf of its member automotive companies. The participating members of ELVS are: Chrysler Group LLC; Daimler EAPP Americas; Ford Motor Company; Motors Liquidation Company (formerly General Motors Corporation); Mack Trucks Inc; Mitsubishi Motors North America, Inc; Navistar, Inc; Nissan North America, Inc; PACCAR, Inc; Porsche Cars North America Inc.; Subaru of America, Inc; Toyota Motor Sales USA, Inc.; Volkswagen Group of America, Inc; and Volvo Trucks North America.

**Mercury Switches Collected**

A total of 1,241 mercury switches were delivered to the ELVS recycling contractor from Maryland dismantlers during the month of December, 2009, yielding 2.73 pounds of recovered mercury. There were 106 registered dismantlers, five of which submitted switches. (Historically, a total of 15,537 mercury switches yielding 34.18 lbs. of mercury were submitted since the ELVS program began.)



### Mercury Switch Capture Rate

The mercury switch capture rate is based on the number of switches recovered and the estimated annual number of switches available for recovery. Because this report covers only one month, ELVS is not able to estimate number of switches available for that time period and is unable to calculate a meaningful capture rate. Subsequent annual reports will be based on full calendar year switch volumes and estimates and will accurately identify the true capture rate.

### Vehicle / Switch Estimates

ELVS uses the National Vehicle Mercury Switch Recovery Program (NVMSRP) Switch Retirement Model ([www.elvsolutions.org/model.html](http://www.elvsolutions.org/model.html)) approved by the U.S. EPA and program partners to estimate mercury switch populations. The model was developed to identify switch populations and estimate mercury switch retirement rates through 2017. Therefore, the model focuses on mercury switch counts rather than vehicle counts.

In 2009, the model was updated. Version 1 of the model made an adjustment for exports based on older (non-current) export data. A new, current source of export data was identified and has been incorporated into the new Version 2 of the model. Additionally, Version 1 did not allow adjustments for economic recessions when the vehicle retirement rate decreases. Version 2 allows for such adjustments.

The model will be reviewed annually and incorporate the most recent export data as well as data regarding the size of the recession adjustment. If the economy is in a recession, then the total switches available for collection will be adjusted down by 9.4% unless additional data indicate this adjustment should change. If there is no recession, no downward 'recession adjustment' will be made to the data.

The model estimates that the national total number of mercury switches historically manufactured in vehicles to be 169,185,000. Most of the vehicles containing these switches have already been scrapped, with an estimated 22,008,000 switches remaining in today's national fleet for collection through 2017. Maryland's portion of these switches remaining for collection through 2017 is estimated at 314,000.

For reference and according to the model, the number of mercury switches that were available nationally for recovery in 2009 was estimated to be 3,734,000 units. In Maryland 51,000 switches were available for recovery in 2009.

For your convenience, regularly updated collection information is available through our contractor's (Environmental Quality) website, <http://www.econline.com/services/ELVS-Mercury-Switch-Recovery-Program/annual-report.asp?year=all>, portions of which are now downloadable into Excel. This web-based data tracking system is part of ELVS' commitment to data accessibility, and will be available at least until 2017.

### Processing of Vehicles

ELVS does not have data on the actual number of end of life vehicles processed. Our estimate is based on data from the 2009 Ward's Motor Vehicle Facts & Figures. On page 63 of Wards, the number of vehicles retired from use nationally in 2008 (the latest year given) is 14,045,000. Total registrations for Maryland for 2007 (again, the latest year given) is found on page 42 and is 4,510,464 out of the 251,210,146 registered nationally. We estimate approximately 252,200 end of life vehicles were processed in Maryland in 2008 ( $14,045,000 * (4,510,464 / 251,210,146)$ ). This does not include end of life vehicle imports or exports from the state or the effect of recessions. We realize that the number of vehicles retired annually varies year to year depending on many conditions. Our estimate is therefore based on the best available data.

### Improvement Actions

The overall goal of NVMSRP is to maximize the participation rate, monitor results, and make on-going program improvements as needed to increase the number of switches returned to ELVS. Because the reporting period covers only one month (December, 2009) a baseline capture rate from which to measure improvement or identify additional needed actions cannot be developed at this time. However, NVMSRP and its member organizations, including ELVS, continually analyze the results of the mercury switch programs to identify ways to enhance their effectiveness. We will keep Maryland informed of any improvement actions that are identified and undertaken to achieve program goals.

### Mercury Switch Management

Mercury switches received by ELVS are generally managed as follows:

- Dismantlers remove the switch assemblies and place them in the collection bucket, or extract and place the mercury pellets in the collection buckets. ABS assemblies with multiple pellets are returned as units.
- Once the buckets are full, the dismantler contacts EQ Industrial Services, Inc. which pays for the shipping of the buckets to its facility in Michigan.
- EQ records the number of pellets and enters them into its database. The pellets are then sent to a retorting facility where the mercury is recycled.

### Program Costs

As of the date of this report, the ELVS plan has not been approved by MDE, and any program costs incurred by ELVS during the December 2009 reporting period were part of the voluntary plan that existed prior to the passage of the Maryland law. Full calendar year costs will be itemized in future reports.

### Conclusion

We look forward to the full implementation of the Maryland mercury switch program and look forward to a steady increase in the number of switches returned to ELVS for recycling in 2010.

If you have any questions or comments regarding this report, please contact me at [brelvs@yahoo.com](mailto:brelvs@yahoo.com).

Sincerely,



Brian Rippon  
End-of-Life Vehicle Solutions  
Project Manager