

Chapter VIII Moderate Risk Waste Management



The term “moderate risk waste” was created by revisions to Washington State’s 1986 Hazardous Waste Management Act (RCW 70.105). MRW is a combination of household hazardous waste (HHW) conditionally exempt small quantity generator (CESQG) waste. HHW is considered waste that was generated in the home, while CESQG is small quantities of business or non-household waste.

Both HHW and CESQG waste are exempt from hazardous waste regulations.

MRW FACTOIDS

- Total MRW collection in 2001 was 20 million pounds.
- The average amount of HHW disposed by the 8% of all households that used a HHW collection event or fixed facility was 66 pounds (this does not include the uncounted participants and large quantities of MRW brought to used-oil sites).
- The counties that collected the most used oil per capita were Stevens, Cowlitz, Pacific, Douglas, Lewis, and Franklin.
- The counties that had the largest percentage of participation per housing unit at HHW events or facilities were Klickitat, Spokane, Pend Oreille, Island, and Jefferson.
- The counties that properly disposed or recycled the most MRW per capita were Yakima, Klickitat, Jefferson, Kittitas, and Stevens.

MRW collections started in the early 1980’s primarily as HHW-only events, also known as “round-ups.” These events usually transpired once or twice a year. In the late 1980’s permanent collection facilities, now known as fixed facilities, began to replace the collection events in order to fulfill the need for year-round collection. These efforts resulted in a larger number of customers served, decreased costs, and increased

reuse and recycling of MRW. HHW has been the primary focus of MRW collection programs until recently. Efforts are beginning to produce an increase in the collection of CESQG waste at facilities. Currently there are eighteen public MRW programs that collect CESQG waste.

The 1988 Model Toxics Control Act in Washington State provides a large part of the funding for public MRW programs. Funds are used to meet the planning and implementation requirements for local hazardous waste (MRW) programs in each local jurisdiction.

By 1991 all local governments in the State of Washington had submitted MRW plans. Aspects included in every local MRW plan are CESQG Technical & Disposal Assistance, MRW Public Education, MRW Enforcement and HHW Collection.

Accuracy of Data Collection

Ecology has created and does circulate a standard reporting form to all MRW programs; however, the reported data can vary depending on a program's collection process, how the data is reported, and how the reported data is interpreted.

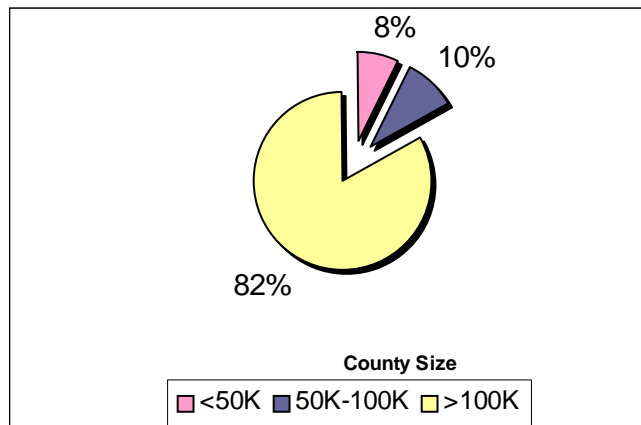
For the 2001 reporting year all programs complied with submitting the required annual reports for year 2001; however, not every program reported all the required information. This report will note key areas where there is unusual data or anomalies.

Year 2001 Data

This year's report focuses on year 2001 data with some comparisons to the data published in last year's report. This is the first year that data is broken out comprehensively by county (See Table 7.8). In an attempt to provide useful information for individual programs, it was determined that data would be presented in categories by county size. Figure 7.1 and Table 7.1 indicates a

distinction between counties with a population of less than 50 thousand, 50 thousand to 100 thousand, and populations greater than 100 thousand.

Figure 7.1
Percent of State Population by County Size



In Washington State there are 42 programs that manage MRW. All programs are required to provide individual MRW reports. These programs include all 39 counties. King County generates four reports: King County Waste Mobile and Used Oil Collection System, Seattle Solid Waste Utility (HHW), Port of Seattle (HHW) and Seattle City Light (CESQG). King County data is segregated from Seattle data in the form of Seattle Solid Waste Utility, Port of Seattle, and Seattle City Light, and these programs report as three separate programs. Some counties combine reports. Columbia County data is included with Walla Walla County data and Garfield County data is included with Asotin County data. Wahkiakum County data is included with Cowlitz County data except for one used oil site report for Wahkiakum County.

Many HHW collection systems are approaching stability. There are no remaining large counties without a permanent HHW collection facility (or fixed facility). Some programs continue to explore or are expanding. It is unclear to what extent local programs will be accepting increasing quantities of CESQG, electronics, and other types of MRW wastes not typically accepted in the past. CESQG waste is being accepted by more local programs each year.

**Table 7.1
Individual County Population by Size**

<50K		50K-100K		>100K	
Adams	16,428	Chelan	66,616	Benton	142,475
Asotin*	22,948	Clallam	64,525	Clark	345,238
Douglas	32,603	Cowlitz*	96,772	King*	1,173,660
Ferry	7,260	Grant	74,698	Kitsap	231,969
Franklin	49,374	Grays H	67,194	Pierce	700,820
Jefferson	25,953	Island	71,558	Skagit	102,979
Kittitas	33,362	Lewis	68,600	Snohomish	606,024
Klickitat	19,161	Walla Walla*	59,244	Spokane	417,939
Lincoln	10,184	50K-100K total	569,207	Thurston	207,355
Mason	49,405			Whatcom	166,814
Okanogan	39,564			Yakima	222,581
Pacific	20,984			SeattleSWU	563,374
Pend Oreille	11,732			>100K total	4,881,228
San Juan	14,077				
Skamania	9,872				
Stevens	40,066				
Whitman	40,740				
<50K total	443,713				

- Populations were combined: Garfield w/ Asotin; Wahkiakum w/ Cowlitz; Columbia w/ Walla Walla
- King excludes Seattle
- Seattle SWU is Seattle only

MRW Collected

As shown in Table 7.2, Washington collected over 10.4 million pounds of HHW, over 8.2 million pounds of used oil (UO) from collection sites, and over 1 million pounds of CESQG waste, for a total of nearly 20 million pounds of MRW collected in 2000.

Table 7.2

Year 2001 Total Pounds Collected Per Waste Category

HHW lbs. (no UO Sites)	Used Oil lbs. (Collection Sites)	HHW lbs. (including UO Sites)	CESQG lbs.	Total MRW lbs.
10,469,392	8,263,484	18,732,875	1,064,361	19,797,236

The totals in Table 7.2 reflect a slight decrease from an estimated 20.4 million pounds of MRW collected in 1999. This decrease as shown in Table 7.3 is due in part because of a one million pound drop in used-oil collections between the two years that was only partially covered by the increasing HHW collection.

Table 7.3

Total Pounds per Waste Category for Years 1998, 1999, 2000, 2001

Collection Year	HHW lbs. (no UO Sites)	Used Oil lbs. (Collection Sites)	CESQG lbs.	Total MRW lbs.
1998	~9.6M	~9.2	~500K	~19.3M
1999	~9.9M	~9.3M	~637K	~20.4M
2000	~10.5M	~8.3M	~1.1M	~19.8M
2001				

Figure 7.2

HHW (no UO sites) Pounds Per Participant by County Size

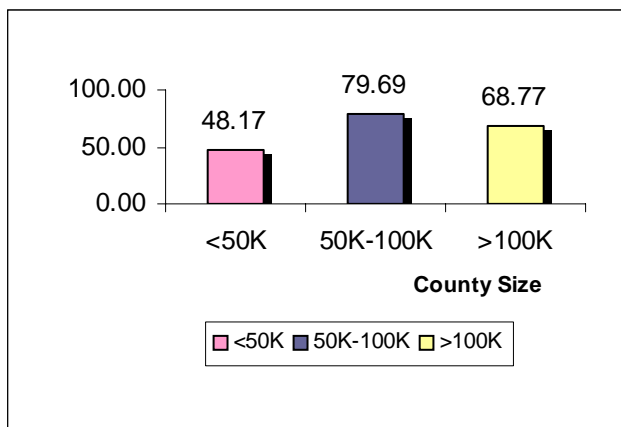


Figure 7.2 shows the total pounds of HHW (no UO sites) collected per participant by county size in 2001. The average pounds collected statewide per participant for HHW collections was 66.

Household Hazardous Waste

As shown in Table 7. 4, the dominant types of HHW collected in 2001 were non-contaminated used oil, oil-based and latex paint, flammable liquids and lead acid batteries. These specific waste types accounted for 80% of the estimated 10.5 million pounds of HHW collected in 2001. These are the same top five HHW types as in 1998 and 1999.

With the exception of lead acid batteries, the dominant types of HHW collected in 1999 were the same.

Table 7.4

HHW Dominant Waste Types Collected in 2001

Waste Type	Total Lbs.
Oil-Non-Contaminated	2,499,686
Oil Based Paint	1,795,596
Latex Paint	1,500,937
Flammable Liquids	1,357,014
Lead Acid Batteries	1,217,023
Total	8,370,256

Table 7. 5 shows the top five counties with the highest collections of HHW (not including contaminated-oil, oil filters and antifreeze collected from UO sites) in pounds per capita for 1999, 2000, 2001.

Table 7.5

High Collections of HHW (no UO Sites) Pounds Per Capita by County in 1999-2001

HHW 1999			HHW 2000			HHW 2001		
County	Size	Lbs./Capita	County	Size	Lbs./Capita	County	Size	Lbs./Capita
Skamania	<50K	4.14	Klickitat	<50K	5.96	Klickitat	<50K	5.96
Yakima	<100K	4.00	Pend Oreille	>50K	4.78	Pend Oreille	<50K	4.78
Kittitas	<50K	3.97	Benton	<100K	3.97	Benton	>100K	3.97
Lewis	50K-100K	3.62	Yakima	>100K	3.82	Yakima	>100K	3.82
Klickitat	>50K	3.02	Kittitas	<50K	3.61	Kittitas	<50K	3.61

Conditionally Exempt Small Quantity Generator Waste

Figure 7.3

Percent of Total CESQG Pounds Collected by County Size

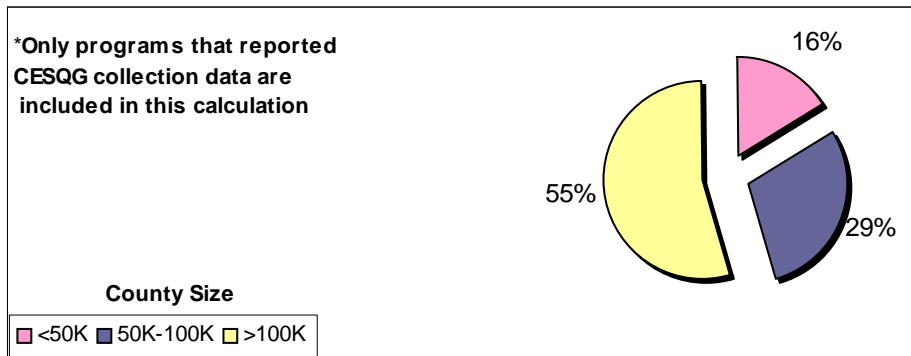


Figure 7.3 shows collection efforts (measured in % of total pounds) of CESQG waste by county size. There are

eighteen local MRW programs that collect CESQG waste from the public. Counties that sponsor CESQG waste collections are Asotin, Benton, Clallam, Clark, Cowlitz, Douglas, Grant, Grays Harbor, Island, Jefferson, Kitsap, San Juan, Skagit, Snohomish, Whatcom, and Yakima. Also Included in CESQG waste totals for year 2000 are data from Philip Services. Philip Services primarily serves CESQG's in three counties: King, Pierce and Clark.

As shown in Table 7.6 the dominant types of CESQG waste collected in 2001 were non-contaminated oil, flammable liquid, oil based and latex paint. These specific waste types accounted for 70% of the 1 million pounds of CESQG waste collected in 2001.

Table 7.6

CESQG by Waste Type Collected in 2001

Waste Type	Total lbs. CESQG
Oil Non-Contaminated	288,393
Flammable Liquids	211,143
Oil Based Paint	157,920
Latex Paint	98,494
Antifreeze	77,353
Lead Acid Batteries	36,528
Flammable Liquids, aerosols	21,853
Oil Filters Crushed	21,730
Other Dangerous Waste Bases	20,442
Oil Contaminated	19,570
Crushed Cans	19,190
Other Non Hazardous Acids	18,277
Dry Cell Batteries	12,726
Oil Filters	11,620
Flammable Liquids	7,543
	7,236
	6,945

Poison	
Pesticide/Poison Liq	3,705
Pesticide/Poison Sol	2,787
CFC/ Freon filters	2,526
CFC/ Freon	2,090
Flammable Solids	1,390
Oxidizers	947
Flammable Gas	826
Flammable Liq. Pois., aerosols	712
Chlorinated Solvents	690
Flammable Gas	22
Poison	
Organic Peroxides	22
Reactives	12
TOTALS	1,064,361

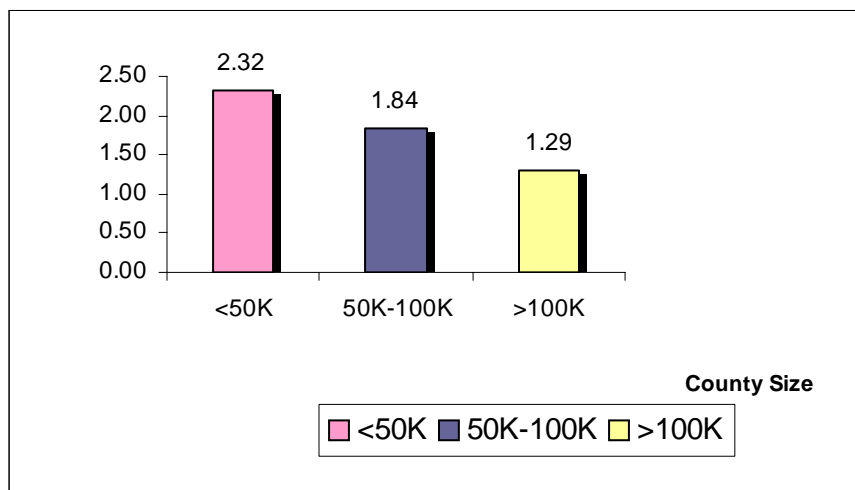
Used Oil Sites

In 2001, reported used oil collection sites yielded 8,263,484 pounds of used oil, oil filters and antifreeze. Used oil collection by county size showed variability in pounds per capita. For example, Stevens County with a population of 40,066 collected 156,364 pounds of used oil, oil filters and antifreeze from 11 sites, while Clark County with a population of 345,238 collected 189,536 pounds of used oil, oil filters and antifreeze from nine sites (or about 0.6 lbs/capita). See Table 7.7 for highest collections in pounds per capita by county size for 1999, 2000 and 2001.

Figure 7.4

Used Oil Pounds Per Capita Collected by County Size

Figure 7.4 shows the average pounds per capita of used oil, oil filters and antifreeze



collected at used oil sites by county size. Counties with populations less than 50 thousand collected 2.3 lbs/capita; counties between 50 thousand and 100 thousand collected 1.8 lbs/capita; and counties with populations over 100 thousand collected 1.3 lbs/capita.

Table 7.7 shows the top six counties with the highest collections in pounds per capita of used-oil, oil filters and antifreeze at used-oil collection sites for 1999, 2000, and 2001.

Table 7.7

High Collection Counties, Used-Oil Sites Pounds Per Capita by County Size

Used Oil Sites - 1999			Used Oil Sites - 2000			Used Oil Sites - 2001		
County	Size	Lbs./Capita	County	Size	Lbs./Capita	County	Size	Lbs./Capita
San Juan	<50K	6.1	Stevens	<50K	3.9	Stevens	<50K	3.9
Asotin	<50K	4.2	Cowlitz	50K-100K	3.7	Cowlitz	50K-100K	3.7
Stevens	<50K	4.0	Pacific	<50K	3.6	Pacific	<50K	3.6
Klickitat	<50K	3.7	Douglas	<50K	2.9	Douglas	<50K	2.9
Cowlitz	50K-100K	3.1	Lewis	50K-100K	2.8	Lewis	50K-100K	2.8
Jefferson	<50K	3.0	Franklin	<50K	2.7	Franklin	<50K	2.7

Statewide Level of Service

The US Census Bureau reports that as of 2001 there were an estimated 2,180,551 Housing Units¹ in Washington State. MRW Annual Reports revealed there were 155,473 participants in HHW collection in 2001 excluding numbers for Adams, Skagit and Whitman because this information was not provided. The actual number of households served is much larger due to the fact that most used oil sites do not record or report numbers of participants (Spokane is the exception). Because some participants that are counted at events or by facilities bring HHW from multiple households, the number of households served can be estimated by adding ten percent to the participant values for an estimated 171,020 households served in 2001. This number represents nearly 8% (7.8%) of all households in Washington State. This is an increase from 2000 when an estimated 7.2% of Washington households were served.

Table 7.8, on the following page, shows participant levels and amounts of HHW and total MRW collected by county.

¹ This information was downloaded from Website <http://quickfacts.census.gov/hunits/states/53cty.html>.

Table 7.8
Various Data by County

COUNTY	HOUSING UNITS	HHW Participants	% Participant /Housing Unit	HHW Cost /Participant	HHW lbs. /Participant	HHW & UO Sites Ttl. lbs.	MRW Ttl. lbs.
Adams	5773	Number of Participants Not Reported				29,525	29,525
Asotin*	10,399	770	7%	\$ 71.24	24	18,701	18,931
Benton	55,963	3,565	6%	\$ 47.65	159	769,174	789,654
Chelan	30,407	476	2%	\$ 173.24	124	119,630	119,630
Clallam	30,683	770	3%	\$ 72.98	61	209,781	213,008
Clark	134,030	3,672	3%	\$ 73.07	229	1,029,973	1,029,973
Cowlitz*	40,416	1,729	4%	\$ 87.27	93	512,745	523,320
Douglas	12,944	381	3%	\$ 79.81	83	125,895	129,264
Ferry	3,775	26	1%	\$ 72.92	52	5,047	5,047
Franklin	16,084	150	1%	\$ 132.50	59	143,330	143,330
Grant	29,081	473	2%	\$ 89.48	103	72,409	74,042
Grays Harbor	32,489	879	3%	\$ 107.62	74	64,990	90,021
Island	32,378	3,308	10%	\$ 40.47	36	255,925	313,989
Jefferson	14,144	1,415	10%	\$ 51.24	62	150,759	157,159
KingPOS*	N/A	100	0%	\$ 12.00	26	20,368	20,368
King*	471,713	41,162	9%	\$ 89.87	87	4,740,140	4,740,140
Kitsap	92,644	3,068	3%	\$ 151.58	102	636,749	668,953
Kittitas	16,475	463	3%	\$ 103.54	260	191,220	191,220
Klickitat	8,633	8,576	99%	\$ 4.83	13	122,816	122,816
Lewis	29,585	947	3%	\$ 72.54	256	397,921	397,921
Lincoln	5,298	150	2%	\$ 73.33	29	4,305	4,305
Mason	25,515	531	2%	\$ 81.91	122	145,304	145,304
Okanogan	19,085	195	1%	\$ 265.69	196	38,220	38,220
Pacific	13,991	130	1%	\$ 474.75	76	84,733	84,733
Pend Oreille	6,608	1,020	15%	\$ 31.15	55	56,092	56,092
Pierce	277,060	8,669	3%	\$ 37.54	146	1,612,137	1,612,137
San Juan	9,752	397	4%	\$ 91.51	101	66,533	70,639
Skagit	42,681	Number of Participants Not Reported				350,935	375,378
Skamania	4,576	128	3%	\$ 115.75	155	49,706	49,706
Snohomish	236,205	9,486	4%	\$ 52.31	91	1,493,568	1,596,142
Spokane	175,005	34,000	19%	\$ 10.97	10	1,019,331	1,019,331
Stevens	17,599	524	3%	\$ 46.63	113	215,792	215,792
Thurston	86,652	5,583	6%	\$ 6.45	57	876,208	887,877
Walla Walla*	23,165	1,481	6%	\$ 87.30	42	124,431	124,431
Whatcom	73,893	3,353	5%	\$ 48.93	53	252,822	320,769
Whitman	16,676	Number of Participants Not Reported				46,790	46,790
Yakima	79,174	4,654	6%	\$ 1.93	183	1,380,674	1,901,304
Seattle SWU*	270,524	13,242	5%	\$ 45.37	80	128,921	128,921
CESQG Only*							171,779
Statewide	N/A	155,473	N/A	N/A	N/A	18,719,603	19,783,964

- Housing units as well as reported data were combined for the following counties: Asotin includes Garfield; Cowlitz includes Wahkiakum; and Walla Walla includes Columbia.
- King excludes Seattle.
- KingPOS represents Port of Seattle serving approximately 100 residential/pleasure boats.
- Seattle SWU represents Seattle Solid Waste Utility.
- CESQG Only represents Seattle City Light and Philip Services (Clark, Pierce and King).

Collection by Waste Category and Type

Table 7.9 provides summary information on total pounds collected in all three categories of MRW by waste types.

Table 7.9

Total Pounds of MRW Collected by Waste Category

Waste Type	HHW	CESQG	UO Sites
Acids	56,683	11,620	
Acids, aerosols	-	-	
Antifreeze	285,283	77,353	215,392
Bases	73,474	19,570	
Bases, aerosols	1,030	-	
CFC/ Freon	2,071	2,090	
CFC/ Freon filters	5,117	2,526	
Chlorinated Solvents	3,913	690	
Crushed Cans	125,659	18,277	
Dry Cell Batteries	115,204	7,543	
Flammable Solids	24,649	1,390	
Flammable Liquids	1,357,014	211,143	
Flammable Liquids, aerosols	229,047	21,853	
Flammable Liquids Poison	57,215	6,945	
Flammable Liq. Pois., aerosols	375,554	712	
Flammable Gas	20,480	826	
Flammable Gas Poison	4,338	22	
Flammable Gas Pois., aerosols	9,829	-	
Latex Paint	1,500,937	98,494	
Lead Acid Batteries	1,217,023	36,528	
Oil-Based Paint	1,795,596	157,920	

Waste Type	HHW	CESQG	UO Sites
Oil Contaminated	119,742	19,190	
Oil Filters	31,377	7,236	38,957
Oil Filters Crushed	1,105	21,730	
Oil Non-Contaminated	2,499,686	288,393	8,009,135
Oil with Chlorides	-	-	
Oil with PCBs	500	-	
Other Dangerous Waste	24,427	20,442	
Organic Peroxides	403	22	
Oxidizers	17,434	947	
Personal Protect. Equip.	1,165	-	
Pesticide/Poison Liq	156,630	3,705	
Pesticide/Poison Sol	203,836	2,787	
Reactives	3,375	12	
Other Non Hazardous	161,266	12,726	
Totals	10,469,392	1,064,361	8,263,484

*HHW numbers include Port of Seattle data.
CESQG numbers include Seattle City Light and Philip Services.

Trends in Collection

As fixed facilities continue to gain popularity, the numbers of collection events are decreasing. Some programs are eliminating collection events altogether or using hybrid mobile collection systems. Reasons for this shift include: increased cost of collection events per amount of waste collected, fixed facilities providing a sense of permanence and normality to the collection of MRW, and increased operation efficiencies with fixed facilities.

Mercury Waste Streams and Other Waste Streams

MRW collection programs are well established statewide. Many of these programs are exploring management of various other components of municipal solid waste. Mercury-containing lamps and electronic wastes are two of these emerging waste types.

There is a need to pay attention to the collection of mercury waste streams. Fluorescent and high intensity lamps contain small amounts of mercury. There will be an estimated 35 tons of mercury discharged into the atmosphere from the 550 million lamps currently in use by Americans (Greskovich 1997).

Used electronics are also of concern. Components in a number of electrical and electronic products are known to contain one or more of the following substances: mercury, lead; cadmium; embedded batteries; and polychlorinated biphenyls (PCBs).

As technology continues to lead to better electronic products, and as more people become financially able to obtain these popular commodities, disposal of the leftovers as well as their components becomes a concern for Ecology and local solid waste managers. For example, in the European Union an estimated four percent of their municipal solid waste stream is electronics, other electrical devices and appliances as of 1999. By the year 2010, predictions for this waste sub-stream will double (Ecology 1999).

Annual Reporting

Local programs are required to submit MRW report forms annually. For the past few years, Ecology has requested annual reports be received by March for previous calendar year collections. The information received from local programs through the MRW annual reports provides Ecology with data on MRW infrastructure, collection trends, cost, waste types received by collection events and fixed facilities, and the final disposition of MRW. This data is translated into the information contained in Chapter 8 of Ecology's Solid Waste Annual Status

Report and is specifically designed to be useful to those who operate or work MRW programs within Washington State.

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