

Northern Virginia Resident Stormwater Knowledge and Behavior Study

2023 Summary Report of Findings

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1 INTRODUCTION AND APPROACH

Keisler Social & Behavioral Research (Keisler Research) was contracted by the Northern Virginia Regional Commission (NVRC) to conduct a survey of northern Virginia residents to capture knowledge, perceptions, beliefs, and behaviors surrounding stormwater and water pollution. The survey also assesses awareness and perceptions of two media campaigns conducted by the Northern Virginia Clean Water Partners (NVCWP) on stormwater drainage and water pollution, as well as awareness perceptions of NVCWP as an organization. The survey instrument is provided in the APPENDIX.

The survey was administered online in June of 2023 on the Alchemer survey platform. Individuals that participate in Alchemer's survey panel, and other partner survey panels, were invited to participate in the survey. Compensation was provided in the form of points on the Alchemer panel system, which can be redeemed for gift cards, prize drawings, and retail deals. To qualify for the survey, respondents must have been 21 years of age or older at the time of participation and reside in of the following cities and counties in northern Virginia: Fairfax County, Loudoun County, Prince William County, Arlington County, and Alexandria.

2 SUMMARY OF 2023 FINDINGS

2.2 Participant Characteristics

The final dataset includes surveys of 596 adults residing in Northern Virginia. Northern Virginia is defined as the following cities and counties: Fairfax County, Loudoun County, Prince William County, Arlington County, and Alexandria. All participants were above 21 years of age.

A demographic summary of survey participants is provided in Table 1. Survey participants were about evenly split between men (51.6%) and women (46.9%). All participants were above 21 years of age. About one-quarter of respondents fell between 25-to-34-years-olds, while only 1.3% of respondents were 75 or older. White people make up over 40% of the sample and African American or Black people comprised just over one-third of the sample. Participants were asked which locality they reside in and the locality with the highest rate is Fairfax County (16.5%) followed by Alexandria (15.7%) with Falls Church (3.3%) and Manassas Park (1.2%) having the smallest rates in the sample. Household income is fairly evenly split amongst participants, with most participants living in a household with an income between \$50,000 and \$149,999.

About three-fourths of the sample have lived in their residence between 1 and 19 years, while 17.0% have lived in their current residence for over 20 years. A majority of participants (57.8%) own their residence. Most participants also have a lawn or garden in their home (79.0%) and a majority also own or lease a vehicle (88.3%). About half (51.0%) own at least one dog.

Demographic	Sub-category	Percentage
Gondor	Male	51.6%
Gender	Female	46.9%
	21 to 24	16.5%
	25 to 34	28.9%
	35 to 44	25.9%
Age	45 to 54	12.2%
	55 to 64	8.8%
	65 to 74	6.3%
	75 or older	1.3%
	African American/Black	33.9%
	American Indian/Native Alaskan	2.7%
	Asian	14.4%
Ethnicity	Hispanic/Latino	12.9%
	Native Hawaiian/Pacific Islander	1.5%
	White/Caucasian	41.2%
	Other	2.7%
	Alexandria	15.7%
	Arlington	12.0%
Locality	Fairfax City	8.7%
	Herndon	5.0%
	Vienna	4.2%

Table 1. Survey participant demographic characteristics. .

Demographic	Sub-category	Percentage			
	Fairfax County	16.5%			
	Falls Church	3.3%			
	Leesburg	6.8%			
	Loudoun County	8.5%			
	Dumfries	5.0%			
	Manassas	5.3%			
	Manassas Park	1.2%			
	Prince William County	7.7%			
	Less than 1 year	12.4%			
	1 to 3 years	28.4%			
Years of Residence	4 to 9 years	26.2%			
	10 to 19 years	16.0%			
	20 or more years	17.0%			
	Owned	57.8%			
	Rented	39.6%			
Home Ownership	Military housing	1.5%			
	Transitional housing	0.7%			
	Other (write-in)	0.5%			
	Less than \$35,000	12.2%			
	\$35,000 to \$49,999	10.9%			
	\$50,000 to \$74,999	19.9%			
	\$75,000 to \$99,999	16.7%			
Household Income	\$100,000 to \$124,999	11.2%			
	\$125,000 to \$149,999	11.0%			
	\$150,000 to \$174,999	6.3%			
	\$175,000 to \$199,999	3.8%			
	\$200,000 or greater	8.0%			
Lawn or Garden at	Yes	79.0%			
Residence	No	21.0%			
Own or Loose a Vahiela	Yes	88.3%			
Own of Lease a venicle	No	11.7%			
Dog Ownorship	Yes	51.0%			
Dog Ownersnip	No	49.0%			

2.3 Behaviors and Behavioral Drivers

2.3.3 Lawn/Garden Fertilization

Respondents were asked about their behavior regarding lawns or gardens and if their residence has a lawn or garden regardless of size. Results are summarized in Table 2 and displayed in

Figure 1. Over three-fourths of those surveyed (79.0%) report having a lawn or garden, no matter how small. Of those with a lawn or garden, 66.1% report using a lawn care service at least once per year and almost all (91.6%) are familiar with how their lawn is cared for. Respondents with lawns were asked how often their lawns were fertilized, regardless of whether fertilization was done by someone in the household or an outside service. The response options were "1 time a year", "2 times a year", "3 times a year", "4+ times a year", "Only if/when a soil test indicates the grass needs fertilizer", "Never", or "Not sure". Far fewer (12.4%) fertilize only when a soil test indicates the grass needs fertilizer, and about one-fifth (19.8%) never fertilize their lawn or garden.

More men than women are familiar with how their lawn or garden is cared for, and more men use lawn services than women. Familiarity with how the lawn/garden is cared for also generally increases with resident tenure (i.e., how long the respondent lived in the location). Men report fertilizing more frequently than women, and women reported higher rates of never fertilizing compared to men. Additionally, in general, higher age groups had higher rates of never fertilizing.

Demographic	Sub-category	Familiar with Lawn/Garden Care	Lawn Care Service Used at Least Once a Year	Frequency of Lawn Fertilization					
				1 time a year	2 times a year	3 times a year	4+ times a year	Only if soil test indicates	Never
	All Respondents	91.6%	66.1%	18.2%	25.5%	16.3%	11.3%	9.9%	13.0%
Gender	Male	93.3%	75.2%	15.8%	29.9%	23.5%	13.7%	7.7%	8.1%
	Female	90.7%	54.9%	20.5%	20.5%	7.6%	7.6%	12.4%	19.5%
Age	21 to 24	83.1%	68.8%	17.2%	32.8%	14.1%	14.1%	9.4%	6.3%
	25 to 34	92.4%	71.8%	17.4%	26.6%	13.8%	15.6%	11.0%	10.1%
	35 to 44	93.9%	73.1%	22.1%	23.8%	22.1%	9.8%	8.2%	8.2%
	45 to 54	94.7%	66.7%	16.7%	24.1%	13.0%	7.4%	18.5%	16.7%

Table 2. Lawn a	nd garden	fertilization	<i>behaviors</i>	by den	nographic (group
	5				5 1 5	J 1

Demographic	Sub-category	Familiar with Lawn/Garden Care	Lawn Care Service Used at Least Once a Year	Frequency of Lawn Fertilization			lization		
				1 time a year	2 times a year	3 times a year	4+ times a year	Only if soil test indicates	Never
	55 to 64	90.7%	30.2%	15.4%	17.9%	5.1%	7.7%	5.1%	41.0%
	65 to 74	93.5%	56.3%	17.2%	24.1%	24.1%	6.9%	6.9%	13.8%
	75 or older	100.0%	71.4%	0.0%	28.6%	28.6%	14.3%	0.0%	14.3%
Locality	Alexandria	84.2%	72.9%	16.7%	33.3%	16.7%	12.5%	6.3%	8.3%
	Arlington	81.6%	65.8%	16.1%	35.5%	9.7%	12.9%	6.5%	16.1%
	Fairfax - Inclusive	94.2%	68.4%	20.2%	22.5%	19.1%	11.2%	12.4%	11.8%
	Prince William - Inclusive	92.4%	58.7%	20.8%	21.9%	10.4%	11.5%	11.5%	11.5%
	Leesburg/Loudon	94.7%	65.3%	11.3%	28.2%	19.7%	9.9%	5.6%	19.7%
Ethnicity	Hispanic/Latino	86.0%	66.7%	22.9%	27.1%	14.6%	12.5%	6.3%	10.4%
	Not Hispanic/Latino	92.4%	66.0%	17.6%	25.3%	16.5%	11.2%	10.4%	13.3%
Years of	Less than 1 year	76.7%	53.5%	12.1%	30.3%	6.1%	3.0%	18.2%	12.1%
Residence	1 to 3 years	87.5%	67.5%	26.9%	21.2%	12.5%	8.7%	13.5%	10.6%
	4 to 9 years	95.2%	71.7%	15.1%	32.8%	17.6%	10.9%	5.0%	14.3%
	10 to 19 years	97.6%	63.0%	12.5%	22.5%	21.3%	15.0%	7.5%	13.8%
	20 or more years	93.6%	65.3%	19.3%	21.6%	18.2%	14.8%	11.4%	13.6%
Home	Owned	96.0%	68.0%	18.1%	26.2%	15.9%	13.3%	9.1%	13.9%
Ownership	Rented	81.5%	60.6%	18.9%	22.6%	17.9%	3.8%	13.2%	10.4%
Household Income	Less than \$35,000	78.7%	52.2%	24.3%	24.3%	10.8%	2.7%	16.2%	16.2%
	\$35,000 to \$49,999	90.2%	62.8%	10.8%	27.0%	16.2%	8.1%	13.5%	16.2%
	\$50,000 to \$74,999	88.2%	62.4%	17.3%	19.8%	14.8%	13.6%	12.3%	14.8%
	\$75,000 to \$99,999	93.5%	75.9%	13.9%	30.6%	15.3%	12.5%	9.7%	9.7%
	\$100,000 to \$124,999	88.2%	60.0%	26.7%	26.7%	13.3%	6.7%	6.7%	15.6%
	\$125,000 to \$149,999	100.0%	62.7%	20.3%	27.1%	16.9%	10.2%	8.5%	13.6%
	\$150,000 to \$174,999	100.0%	71.9%	12.5%	25.0%	31.3%	12.5%	6.3%	6.3%
	\$175,000 to \$199,999	95.2%	90.5%	15.0%	20.0%	35.0%	15.0%	5.0%	10.0%
	\$200,000 or greater	95.5%	69.8%	22.0%	26.8%	7.3%	19.5%	7.3%	12.2%



Figure 1. Frequency of lawn fertilization.

Table 3. Lawn fertilization frequency across years.

Year of Survey									
How often lawn is fertilized per year	2016	2017	2018	2019	2020	2021	2022	2023	
1 time	33.6%	31.0%	28.4%	26.4%	37.8%	38.3%	34.3%	19.3%	
2 times	22.0%	24.8%	23.9%	24.8%	17.7%	20.3%	24.1%	27.1%	
3 times	3.6%	3.8%	8.3%	6.4%	9.2%	6.2%	7.3%	17.3%	
4+ times	5.8%	6.2%	6.8%	7.2%	8.4%	8.6%	7.7%	12.0%	
	-	-	6.1%	6.0%	4.8%	4.5%	3.5%	10.5%	
Per soil test									
Never	35.0%	34.3%	26.5%	29.2%	22.1%	22.1%	23.1%	13.8%	

* *Red font* indicates that the value significantly differs from the current 2023 value.





2.3.4 Grass Clipping Disposal

Respondents that reported having a lawn or garden were asked how they dispose of their grass clippings. The provided response options were "Bagged and put in the regular trash", "Bagged and put in compost/recycling bags for pick up", "Left on the lawn/garden", "Put in a compost pile/bin", "Not sure", "Other", and "Not applicable/don't have grass clippings". As shown in Table 4 and Figure 3, the most common response is bagging the grass and putting it in compost or recycling for pickup, with 31.7% providing this response. The next most common response (28.6%) is leaving the grass on their lawn/garden, while 23.6% of respondents bag it and put it in the regular trash. Finally, 9.0% report putting their grass in a compost pile or bin, 3.5% are not sure how their grass is disposed of, and 0.4% reported disposing of their grass clippings in some other way. Older age groups had higher rates of leaving their grass clippings on the lawn. Men had higher rates of bagging and putting their clippings in the regular trash. People from Arlington had higher rates of putting their grass clippings in the compost pile.

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Demographic	Sub-category		Gras	s Clippings Hand	ling		
		Bagged and put in Regular Trash	Bagged and put in Compost/ Recycling for Pickup	Left on Lawn/Garden	Put in Compost Pile/Bin	Not Sure	Other
	All Respondents	23.6%	31.7%	28.6%	9.0%	3.5%	0.4%
Gender	Male	27.5%	31.8%	28.8%	9.0%	1.3%	0.4%
	Female	18.8%	31.7%	28.5%	8.6%	6.5%	2.2%
Age	21 to 24	28.1%	31.3%	28.1%	7.8%	3.1%	0.0%
	25 to 34	28.7%	38.0%	13.9%	11.1%	2.8%	2.8%
	35 to 44	25.4%	34.4%	25.4%	8.2%	4.1%	0.8%
	45 to 54	24.1%	29.6%	33.3%	7.4%	5.6%	0.0%
	55 to 64	10.3%	20.5%	48.7%	10.3%	2.6%	2.6%
	65 to 74	10.3%	13.8%	58.6%	10.3%	3.4%	0.0%
	75 or older	0.0%	42.9%	42.9%	0.0%	0.0%	0.0%
Locality	Alexandria	25.0%	39.6%	22.9%	6.3%	2.1%	0.0%
	Arlington	30.0%	30.0%	16.7%	23.3%	0.0%	0.0%
	Fairfax - Inclusive	18.6%	34.5%	27.7%	10.2%	4.5%	1.7%
	Prince William - Inclusive	26.8%	26.8%	30.9%	7.2%	3.1%	2.1%
	Leesburg/Loudon	28.2%	26.8%	36.6%	4.2%	4.2%	0.0%
Ethnicity	Hispanic/Latino	26.5%	42.9%	18.4%	8.2%	4.1%	0.0%
	Not Hispanic/Latino	23.3%	30.2%	29.9%	9.1%	3.5%	1.3%
Years of	Less than 1 year	30.3%	21.2%	24.2%	9.1%	9.1%	0.0%
Residence	1 to 3 years	26.7%	37.1%	26.7%	4.8%	2.9%	1.9%
	4 to 9 years	24.4%	32.8%	26.1%	9.2%	2.5%	0.8%
	10 to 19 years	21.8%	32.1%	30.8%	11.5%	1.3%	1.3%
	20 or more years	18.2%	27.3%	34.1%	11.4%	5.7%	1.1%
Home	Owned	22.4%	32.1%	30.2%	8.8%	2.9%	1.3%
Ownership	Rented	26.4%	31.1%	25.5%	7.5%	5.7%	0.9%
Household Income	Less than \$35,000	21.6%	21.6%	35.1%	13.5%	2.7%	2.7%
	\$35,000 to \$49,999	29.7%	21.6%	24.3%	5.4%	8.1%	2.7%
	\$50,000 to \$74,999	32.1%	34.6%	22.2%	4.9%	3.7%	1.2%
	\$75,000 to \$99,999	18.1%	33.3%	31.9%	11.1%	4.2%	0.0%
	\$100,000 to \$124,999	37.8%	24.4%	22.2%	11.1%	2.2%	2.2%
	\$125,000 to \$149,999	6.8%	40.7%	39.0%	8.5%	1.7%	0.0%
	\$150,000 to \$174,999	25.8%	41.9%	16.1%	9.7%	3.2%	0.0%

Table 4. Disposal of grass clippings by demographic group.

Demographic	Sub-category	Grass Clippings Handling							
		Bagged and put in Regular Trash	Bagged and put in Compost/ Recycling for Pickup	Left on Lawn/Garden	Put in Compost Pile/Bin	Not Sure	Other		
	\$175,000 to \$199,999	26.3%	21.1%	26.3%	10.5%	10.5%	0.0%		
	\$200,000 or greater	19.0%	33.3%	35.7%	9.5%	0.0%	2.4%		

Figure 3. Disposal of grass clippings.





Year of Survey										
Grass clipping disposal	2016	2017	2018	2019	2020	2021	2022	2023		
Bagged for regular trash	*	*	14.5%	17.0%	23.3%	24.6%	27.3%	25.4%		
Bagged for compost/recycling pick up	*	*	32.8%	26.4%	26.7%	32.3%	32.0%	34.1%		

Year of Survey										
Grass clipping disposal	2016	2017	2018	2019	2020	2021	2022	2023		
Left on the lawn/garden	*	*	45.7%	48.1%	43.8%	33.7%	33.1%	30.8%		
Put in a compost pile/bin	5.8%	6.2%	7.0%	8.5%	6.3%	9.5%	7.6%	9.7%		

* *Red font* indicates that the value significantly differs from the current 2023 value. Asterisks (*) indicate that the question did not appear in the survey that year.

Figure 4. Disposal of grass clippings across years.



Participants were also asked what is done with grass clippings if they end up in the street, if anything. The response options were "They are left there", "They are swept or blown back into the lawn", "They are swept or blown into the storm drain", "Not applicable/don't have grass clippings", "Not Sure", or "Other" with write-in option. Of those with a lawn or garden, 53.1% report sweeping or blowing them back into their lawn, while 19.7% report leaving them in the street, as can be seen in Table 6 and Figure 5. Lastly, 14.5% report sweeping or blowing them

into the storm drain. People from Leesburg/Loudon (34.7%) had higher rates of leaving grass clippings on the street, compared to other localities.

Demographic	Sub-category		Grass Clip	pings on Stree	t Handling	
		Leave There	Swept or Blown Back into the Lawn	Swept or Blown into Storm Drain	Not Sure	Other
	All Respondents	19.7%	53.1%	14.5%	3.8%	4.0%
Gender	Male	22.3%	53.6%	16.3%	1.3%	3.4%
	Female	16.8%	52.2%	12.5%	6.5%	4.3%
Age	21 to 24	26.6%	54.7%	15.6%	1.6%	0.0%
	25 to 34	20.4%	46.3%	22.2%	3.7%	2.8%
	35 to 44	19.7%	49.2%	18.0%	6.6%	3.3%
	45 to 54	18.5%	68.5%	7.4%	0.0%	1.9%
	55 to 64	17.9%	48.7%	0.0%	7.7%	15.4%
	65 to 74	7.1%	67.9%	0.0%	0.0%	10.7%
	75 or older	14.3%	57.1%	14.3%	0.0%	0.0%
Locality	Alexandria	20.8%	52.1%	16.7%	2.1%	2.1%
	Arlington	23.3%	43.3%	23.3%	0.0%	6.7%
	Fairfax - Inclusive	16.6%	58.9%	12.0%	4.0%	2.9%
	Prince William - Inclusive	12.4%	54.6%	16.5%	5.2%	7.2%
	Leesburg/Loudon	34.7%	41.7%	12.5%	4.2%	2.8%
Ethnicity	Hispanic/Latino	28.6%	49.0%	14.3%	6.1%	0.0%
	Not Hispanic/Latino	18.5%	53.6%	14.5%	3.5%	4.6%
Years of	Less than 1 year	25.0%	43.8%	15.6%	6.3%	0.0%
Residence	1 to 3 years	15.4%	56.7%	16.3%	5.8%	3.8%
	4 to 9 years	20.2%	54.6%	12.6%	2.5%	5.9%
	10 to 19 years	23.8%	47.5%	16.3%	3.8%	3.8%
	20 or more years	18.4%	55.2%	12.6%	2.3%	3.4%
Home	Owned	20.8%	52.1%	14.7%	3.3%	3.9%
Ownership	Rented	15.1%	56.6%	14.2%	5.7%	3.8%
Household Income	Less than \$35,000	10.8%	56.8%	18.9%	5.4%	0.0%
	\$35,000 to \$49,999	19.4%	55.6%	16.7%	0.0%	0.0%

Table (6.	Handlina	of	arass	cli	nninas	in	street	hv	demoaraphic aroup	
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Demographic	Sub-category	Grass Clippings on Street Handling								
		Leave There	Swept or Blown Back into the Lawn	Swept or Blown into Storm Drain	Not Sure	Other				
	\$50,000 to \$74,999	18.3%	50.0%	17.1%	7.3%	4.9%				
	\$75,000 to \$99,999	15.5%	59.2%	12.7%	5.6%	5.6%				
	\$100,000 to \$124,999	17.8%	57.8%	15.6%	6.7%	0.0%				
	\$125,000 to \$149,999	19.0%	53.4%	17.2%	0.0%	5.2%				
	\$150,000 to \$174,999	28.1%	40.6%	12.5%	0.0%	0.0%				
	\$175,000 to \$199,999	35.0%	55.0%	0.0%	0.0%	0.0%				
	\$200,000 or greater	26.8%	46.3%	9.8%	2.4%	14.6%				

Figure 5. Handling of grass clippings in the street.



Table 7. Handling of grass clippings in the street across years.

Year of Survey										
Grass clippings in street	2016	2017	2018	2019	2020	2021	2022	2023		
Left there	*	*	27.5%	25.3%	28.3%	25.1%	23.4%	22.6%		
Swept/blow back to lawn	*	*	68.4%	69.3%	63.9%	67.0%	64.2%	60.9%		
Swept/blown to storm drain	*	*	4.1%	5.3%	7.8%	7.9%	12.4%	16.6%		

* *Red font* indicates that the value significantly differs from the current 2023 value. Asterisks (*) indicate that the question did not appear in the survey that year.



Figure 6. Handling of grass clippings in the street across years.

2.3.5 Pet Waste Pickup

Respondents who indicated they are responsible or partially responsible for at least one dog were asked how often they pick up after their dog(s) while on a walk. The response options were "Always", "Usually", "Sometimes", "Rarely", "Never", or "Not applicable/I don't take the dog(s) on walks". The responses are summarized in Table 8 and displayed in Figure 7. Of all respondents, 51.0% report having one or more dog(s) in their household for which they are at least partially responsible. Most dog owners (88.7%) report they always or usually pick up after their dog(s) on walks, 8.6% report sometimes picking up after their dog(s) and 2.9% report rarely or never picking up after their dog(s).

Demographic	Sub-category	Own a Dog	Frequency Pickup Dog Waste on Walks	Frequency Pickup Dog Waste in Yard
	All Respondents	51.0%	88.7%	61.3%

Table 8. Frequency of picking up dog waste by demographic group.

Demographic	Sub-category	Own a Dog	Frequency Pickup Dog Waste on Walks	Frequency Pickup Dog Waste in Yard
Gender	Male	57.5%	88.5%	64.3%
Gender	Female	43.7%	90.2%	56.3%
Age	21 to 24	63.3%	88.7%	57.1%
	25 to 34	58.1%	87.0%	59.5%
	35 to 44	55.2%	85.7%	65.8%
	45 to 54	45.2%	93.9%	58.6%
Age	55 to 64	30.2%	100.0%	69.2%
Locality	65 to 74	18.4%	100.0%	50.0%
	75 or older	12.5%	0.0%	100.0%
	Alexandria	43.6%	95.1%	65.5%
	Arlington	37.5%	85.2%	89.5%
	Fairfax - Inclusive	50.4%	85.7%	54.2%
Locality	Prince William - Inclusive	58.8%	90.9%	57.6%
Lumercy	Leesburg/Loudon	60.9%	89.1%	66.0%
	Hispanic/Latino	57.9%	93.2%	55.0%
Ethnicity	Not Hispanic/Latino	50.0%	87.9%	62.4%
Years of Residence	Less than 1 year	40.8%	93.1%	55.0%
	1 to 3 years	50.0%	92.9%	48.5%
	4 to 9 years	59.9%	76.6%	65.9%
Years of Residence	10 to 19 years	50.0%	91.5%	65.1%
Home Ownership	20 or more years	47.1%	100.0%	71.4%
	Owned	58.4%	88.9%	60.8%
Home Ownership	Rented	39.4%	93.5%	65.6%
Household Income	Less than \$35,000	38.0%	85.2%	69.6%
	\$35,000 to \$49,999	46.2%	90.0%	57.1%
	\$50,000 to \$74,999	44.5%	90.6%	71.1%
	\$75,000 to \$99,999	54.0%	85.2%	56.8%
Household Income	\$100,000 to \$124,999	64.2%	95.2%	53.3%
	\$125,000 to \$149,999	47.0%	74.2%	55.2%
	\$150,000 to \$174,999	64.9%	82.6%	55.0%
	\$175,000 to \$199,999	69.6%	100.0%	81.3%
	\$200,000 or greater	54.2%	100.0%	56.0%

Figure 7. Frequency of picking up dog waste.



Table 9. Frequency of picking up dog waste across years.

Year of Survey	2016	2017	2018	2019	2020	2021	2022	2023
"Always" or "Usually" picks up after dog on	92.4%	92.7%	92.1%	93.0%	85.0%	86.4%	87.5%	88.7%
walks								

* *Red font* indicates that the value significantly differs from the current 2023 value. There are no significant differences from the 2023 value in this table.



Figure 8. Frequency of picking up dog waste across years.

In comparison, dog owners were also asked how often they (or someone from their household) remove dog waste from their yard. The response options were "Not applicable - dog not allowed to go in the home's yard", "Daily", "Weekly", "Monthly", "Less often than once a month", "Never", or "Not sure". When asked about picking up after their dog(s) in their own yard, 61.3% report doing so daily (as shown in Table 8 and Figure 7) and 25.7% report doing so weekly. Men report picking up after their dog(s) in their own yard daily more than women (57.5% of men versus 43.7% of women), whereas 10.1% of women report picking up monthly as compared to 3.2% of men. Individuals from Arlington (89.5%) report higher rates of picking up dog waste in their yard daily more often than people from other localities.

Participants who indicated that they pick up dog waste with any frequency either on walks or in their own yard were asked the most important reason for doing so, the results of which can be seen in Table 10 and Figure 9. The response options were "City/county ordinance", "Don't want to step in it", "It causes water pollution", "It is gross", "It's what good neighbors do", "Odor", "Other reason", or "None/No reason to". In response to this question, 24.9% of dog owners report their most important reason being that it is required by city or county ordinances. Additionally, 19.8% report not wanting to step in it and 16.9% report doing so because it's what

good people do. Finally, 14.8% report their reason being because it causes water pollution, 19.4% said because it is gross, and 3.4% do so because of the odor. People from Prince William and people who have lived in their residence for under 1 year are most likely to report they pick up dog waste because it is gross (38.9%) when compared to other localities and for longer tenures, respectively.

Demographic	Sub-category			Reason fo	r Picking Up	Dog Waste		
		City/county ordinance	Don't want to step in it	It causes water pollution	lt is gross	It's what good neighbors do	Odor	Other reason
	All Respondents	24.9%	19.8%	14.8%	19.4%	16.9%	3.4%	0.8%
Gender	Male	29.7%	18.6%	13.1%	17.2%	17.2%	4.1%	0.0%
	Female	15.7%	22.5%	16.9%	23.6%	16.9%	2.2%	2.2%
Age	21 to 24	22.7%	18.2%	22.7%	20.5%	15.9%	0.0%	0.0%
	25 to 34	22.4%	18.4%	17.1%	23.7%	14.5%	3.9%	0.0%
	35 to 44	28.8%	19.2%	11.0%	20.5%	12.3%	5.5%	2.7%
	45 to 54	32.1%	14.3%	10.7%	10.7%	28.6%	3.6%	0.0%
	55 to 64	8.3%	50.0%	0.0%	8.3%	33.3%	0.0%	0.0%
	65 to 74	25.0%	25.0%	25.0%	0.0%	25.0%	0.0%	0.0%
	75 or older	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Locality	Alexandria	23.1%	19.2%	15.4%	26.9%	11.5%	3.8%	0.0%
	Arlington	42.1%	10.5%	10.5%	15.8%	21.1%	0.0%	0.0%
	Fairfax - Inclusive	19.8%	24.2%	19.8%	11.0%	18.7%	6.6%	0.0%
	Prince William - Inclusive	20.4%	13.0%	13.0%	38.9%	11.1%	0.0%	3.7%
	Leesburg/Loudon	34.0%	23.4%	8.5%	10.6%	21.3%	2.1%	0.0%
Ethnicity	Hispanic/Latino	16.2%	18.9%	21.6%	21.6%	13.5%	8.1%	0.0%
	Not Hispanic/Latino	26.5%	20.0%	13.5%	19.0%	17.5%	2.5%	1.0%
Years of	Less than 1 year	21.1%	5.3%	5.3%	42.1%	26.3%	0.0%	0.0%
Residence	1 to 3 years	23.3%	16.7%	13.3%	25.0%	16.7%	3.3%	1.7%
	4 to 9 years	15.9%	24.4%	19.5%	18.3%	17.1%	4.9%	0.0%
	10 to 19 years	30.8%	20.5%	17.9%	10.3%	17.9%	2.6%	0.0%
	20 or more years	43.2%	21.6%	8.1%	10.8%	10.8%	2.7%	2.7%
Home	Owned	20.8%	23.8%	16.7%	17.9%	16.1%	3.6%	1.2%
Ownership	Rented	36.1%	11.5%	8.2%	24.6%	18.0%	1.6%	0.0%
Household Income	Less than \$35,000	27.3%	13.6%	22.7%	9.1%	27.3%	0.0%	0.0%
	\$35,000 to \$49,999	28.6%	23.8%	19.0%	9.5%	19.0%	0.0%	0.0%
	\$50,000 to \$74,999	27.9%	14.0%	20.9%	23.3%	7.0%	4.7%	2.3%

Table 10. Most important reason for picking up dog waste by demographic group.

Demographic	Sub-category			Reason fo	r Picking Up I	Dog Waste		
		City/county ordinance	Don't want to step in it	lt causes water pollution	It is gross	It's what good neighbors do	Odor	Other reason
	\$75,000 to \$99,999	23.8%	19.0%	14.3%	21.4%	19.0%	2.4%	0.0%
	\$100,000 to \$124,999	14.3%	25.0%	10.7%	28.6%	21.4%	0.0%	0.0%
	\$125,000 to \$149,999	23.1%	15.4%	7.7%	23.1%	11.5%	19.2%	0.0%
	\$150,000 to \$174,999	22.2%	38.9%	5.6%	27.8%	5.6%	0.0%	0.0%
	\$175,000 to \$199,999	43.8%	25.0%	0.0%	6.3%	25.0%	0.0%	0.0%
	\$200,000 or greater	19.0%	14.3%	23.8%	14.3%	23.8%	0.0%	4.8%

Figure 9. Reason for picking up dog waste.



Year of Survey											
Reason	2016	2017	2018	2019	2020	2021	2022	2023			
City/county ordinance	5.5%	9.2%	11.1%	9.4%	27.0%	21.6%	21.4%	24.9%			
Don't want to step in it	29.5%	18.4%	15.0%	13.5%	10.1%	13.7%	13.9%	19.8%			
It causes water pollution	17.8%	19.1%	18.3%	14.6%	9.6%	13.7%	16.8%	14.8%			
It is gross	*	*	25.5%	18.1%	15.2%	14.1%	12.2%	19.4%			
It's what good neighbors do	40.4%	48.7%	24.8%	36.3%	33.7%	30.3%	31.9%	16.9%			
Odor	4.1%	3.3%		3.5%	1.1%	4.1%	2.5%	3.4%			
Other reason	2.7%	1.3%	5.2%	4.7%	3.4%	2.5%	1.3%	0.8%			

Table 11. Reason for picking up dog waste across years.

* *Red font* indicates that the value significantly differs from the current 2023 value. Asterisks (*) indicate that the question did not appear in the survey that year.





2.3.6 Behaviors Related to Vehicles

Respondents were asked if they owned or leased a vehicle, and if so they were asked about their behavior regarding changing motor oil and how the used motor oil is disposed. Because the survey queries knowledge and behaviors regarding changing the motor oil of their personal vehicles, respondents were first asked if they own a personal vehicle. The majority of respondents (88.3%) report having a personal vehicle that they own or lease, as seen in Table 12. Alexandria and Arlington had lower rates of owning or leasing a personal vehicle. People who own their home have higher rates of owning or leasing a vehicle.

2.3.6.1 Disposing of Motor Oil

Those who own or lease a personal vehicle were then asked about how they dispose of motor oil when their vehicle oil is changed (Table 12 and Figure 11). Response options were "I don't change the oil myself/I take it to a garage/oil change service", "Take the motor oil to a gas station or hazmat facility for recycling", "Store it in my garage", "Put it in the trash", "Dump it in the gutter or down the storm sewer", "Dump it down the sink", "Dump it on the ground", and an option to write-in another method not listed. Most of these respondents (70.0%) report taking their vehicle to a garage or oil changing service when the oil needs to be changed. Alternatively, 17.1% report taking the old motor oil to a gas station or hazmat facility, 4.8% store it in their garage, 3.7% put it in the trash, 2.3% dump it on the ground, 1.0% dump it in the gutter or storm drain, and 0.7% dump it down the sink. Women had higher rates of using a garage or oil change service when compared to men, as did older age groups when compared to younger age groups.

Demographic	Sub-category	Own or Lease Vehicle		Vehicle Oil Handling							
			Uses a Garage or Oil Change Service	Gas Station or Hazmat Facility	Store in Garage	Put in the Trash	Dump in Gutter or Storm Sewer	Dump in Sink	Dump on Ground		
	All Respondents	88.3%	70.0%	17.1%	4.8%	3.7%	1.0%	0.7%	2.3%		
Gender	Male	91.2%	50.9%	25.1%	10.8%	7.5%	2.2%	2.5%	0.7%		
	Female	85.7%	72.4%	15.9%	4.2%	3.3%	1.7%	0.0%	2.1%		
Age	21 to 24	84.5%	58.5%	17.1%	9.8%	6.1%	3.7%	2.4%	1.2%		
	25 to 34	87.8%	50.7%	22.0%	14.0%	8.7%	1.3%	1.3%	2.0%		
	35 to 44	91.0%	54.6%	24.1%	7.1%	7.8%	2.8%	2.1%	1.4%		

Table 12. Vehicle possession and motor on nanaling by demographic group	Table 12.	Vehicle	possession	and	motor	oil	handling	by	demographic group
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Demographic	Sub-category	Own or Lease Vehicle		Vehicle Oil Handling							
			Uses a Garage or Oil Change Service	Gas Station or Hazmat Facility	Store in Garage	Put in the Trash	Dump in Gutter or Storm Sewer	Dump in Sink	Dump on Ground		
	45 to 54	90.4%	68.2%	25.8%	1.5%	1.5%	1.5%	0.0%	1.5%		
	55 to 64	88.7%	87.0%	10.9%	0.0%	0.0%	0.0%	0.0%	0.0%		
	65 to 74	84.2%	81.3%	18.8%	0.0%	0.0%	0.0%	0.0%	0.0%		
	75 or older	87.5%	85.7%	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%		
Locality	Alexandria	83.0%	59.0%	19.2%	11.5%	6.4%	1.3%	1.3%	1.3%		
	Arlington	76.4%	53.7%	20.4%	11.1%	14.8%	0.0%	0.0%	0.0%		
	Fairfax - Inclusive	91.0%	60.1%	24.1%	5.4%	4.4%	1.5%	2.5%	1.0%		
	Prince William - Inclusive	91.3%	63.5%	20.2%	6.7%	4.8%	2.9%	0.0%	1.9%		
	Leesburg/Loudon	92.4%	64.7%	16.5%	8.2%	3.5%	3.5%	1.2%	2.4%		
Ethnicity	Hispanic/Latino	87.0%	60.6%	22.7%	9.1%	3.0%	1.5%	0.0%	1.5%		
	Not Hispanic/Latino	88.4%	60.7%	20.7%	7.4%	6.1%	2.0%	1.5%	1.3%		
Years of	Less than 1 year	78.4%	63.2%	24.6%	5.3%	7.0%	0.0%	0.0%	0.0%		
Residence	1 to 3 years	85.8%	71.7%	14.5%	7.6%	3.4%	1.4%	0.0%	1.4%		
	4 to 9 years	92.3%	50.0%	25.7%	9.0%	7.6%	2.8%	3.5%	0.7%		
	10 to 19 years	89.6%	60.0%	14.1%	9.4%	5.9%	4.7%	2.4%	2.4%		
	20 or more years	92.1%	59.1%	28.0%	5.4%	5.4%	0.0%	0.0%	2.2%		
Home	Owned	95.3%	55.5%	24.8%	7.7%	6.1%	2.8%	1.5%	1.5%		
Ownership	Rented	78.1%	71.7%	13.6%	6.5%	4.9%	0.5%	0.5%	1.1%		
Household	Less than \$35,000	58.9%	67.4%	14.0%	7.0%	7.0%	0.0%	0.0%	4.7%		
Income	\$35,000 to \$49,999	79.7%	56.9%	25.5%	9.8%	7.8%	0.0%	0.0%	0.0%		
	\$50,000 to \$74,999	91.6%	59.3%	24.1%	9.3%	1.9%	2.8%	0.9%	0.9%		
	\$75,000 to \$99,999	87.9%	58.6%	18.4%	8.0%	10.3%	1.1%	2.3%	0.0%		
	\$100,000 to \$124,999	97.0%	67.2%	18.8%	3.1%	6.3%	3.1%	1.6%	0.0%		
	\$125,000 to \$149,999	98.5%	60.0%	21.5%	9.2%	3.1%	0.0%	4.6%	1.5%		
	\$150,000 to \$174,999	97.4%	54.1%	18.9%	8.1%	8.1%	8.1%	0.0%	2.7%		
	\$175,000 to \$199,999	100.0%	52.2%	30.4%	13.0%	0.0%	4.3%	0.0%	0.0%		
	\$200,000 or greater	97.9%	67.4%	19.6%	2.2%	6.5%	0.0%	0.0%	4.3%		

Figure 11. Motor oil handling behaviors.



Table 13. Motor oil handling behaviors across years.

Year of Survey										
Motor oil disposal	2016	2017	2018	2019	2020	2021	2022	2023		
Uses a Garage or Oil Change Service	79.8%	83.7%	85.7%	86.5%	76.8%	73.7%	78.9%	60.7%		
Facility for Recycling	13.0%	11.6%	9.8%	8.8%	11.5%	16.0%	10.5%	21.0%		
Store	1.8%	2.0%	2.5%	1.9%	5.9%	3.9%	4.0%	7.6%		
Put in the Trash	1.6%	1.2%	0.8%	1.0%	3.1%	4.1%	4.0%	5.7%		
Dump in Gutter/Sewer	0.0%	0.4%	0.4%	0.8%	1.5%	1.2%	1.5%	1.9%		
Dump in Sink	0.0%	0.0%	0.4%	0.4%	0.6%	0.4%	0.6%	1.3%		
Dump on Ground	3.4%	0.0%	0.0%	0.4%	0.0%	0.2%	0.4%	1.3%		

* *Red font* indicates that the value significantly differs from the current 2023 value.



Figure 12. Motor oil handling behaviors across years.

2.3.6.2 Vehicle Washing

Participants who reported owning or leasing a vehicle were also asked about their vehicle washing behaviors. Behaviors related to vehicle washing were also probed. Respondents were asked where they have washed their personal vehicle in the past year, with response options being "At my home or someone else's home", "At a commercial car wash", "I haven't washed my vehicle", and the option to write in another response not listed. Of those who own or lease a personal vehicle, 21.0% said they wash their car/truck at home, as shown in Table 14 and

Demographic	Sub-category	Wash Car at Home	Wash Car in Grass, Gravel, or Dirt	Wash Car using Environmentally Friendly Detergent	Wash Car using only Water (No Soap)	Wash Car at Commercial Location	Have not Washed Car in Past Year
	All Respondents	21.0%	52.6%	60.3%	28.5%	63.1%	9.3%
Gender	Male	47.2%	53.8%	66.2%	33.6%	66.0%	9.4%
	Female	29.5%	50.6%	50.0%	20.0%	60.5%	8.9%
Age	21 to 24	49.5%	58.3%	57.4%	24.5%	47.5%	10.1%
	25 to 34	37.0%	60.9%	59.4%	26.6%	64.2%	9.2%
	35 to 44	45.8%	57.7%	67.6%	40.0%	68.4%	10.3%
	45 to 54	26.0%	36.8%	52.6%	31.6%	72.6%	8.2%
	55 to 64	24.5%	15.4%	46.2%	0.0%	66.0%	13.2%
	65 to 74	34.2%	23.1%	61.5%	16.7%	55.3%	0.0%
	75 or older	25.0%	50.0%	50.0%	0.0%	62.5%	12.5%
Locality	Alexandria	36.2%	52.9%	48.5%	26.5%	58.5%	6.4%
	Arlington	25.0%	55.6%	66.7%	16.7%	56.9%	11.1%
	Fairfax - Inclusive	45.1%	51.0%	63.7%	31.7%	58.8%	10.2%
	Prince William - Inclusive	39.1%	34.1%	50.0%	17.8%	67.8%	7.0%
	Leesburg/Loudon	34.8%	81.3%	71.9%	43.3%	77.2%	12.0%
Ethnicity	Hispanic/Latino	35.1%	40.7%	40.7%	18.5%	54.5%	11.7%
	Not Hispanic/Latino	39.1%	54.2%	62.9%	29.9%	64.4%	9.0%
Years of	Less than 1 year	21.6%	60.0%	80.0%	31.3%	58.1%	10.8%
Residence	1 to 3 years	37.1%	50.8%	58.7%	28.6%	62.4%	8.8%
	4 to 9 years	41.4%	50.8%	56.3%	25.4%	68.2%	9.6%
	10 to 19 years	50.0%	60.4%	54.2%	39.6%	56.3%	14.6%
	20 or more years	38.2%	46.2%	69.2%	18.4%	66.7%	3.9%
Home	Owned	46.8%	50.9%	65.6%	31.9%	66.8%	10.4%
Ownership	Rented	27.4%	56.9%	47.7%	18.8%	59.9%	5.9%
Household Income	Less than \$35,000	19.2%	69.2%	46.2%	21.4%	37.0%	9.6%
	\$35,000 to \$49,999	33.8%	50.0%	63.6%	28.6%	53.8%	12.3%

Demographic	Sub-category	Wash Car at Home	Wash Car in Grass, Gravel, or Dirt	Wash Car using Environmentally Friendly Detergent	Wash Car using only Water (No Soap)	Wash Car at Commercial Location	Have not Washed Car in Past Year
	\$50,000 to \$74,999	37.8%	55.6%	48.9%	20.0%	65.5%	9.2%
	\$75,000 to \$99,999	43.0%	51.2%	52.4%	27.9%	60.0%	6.0%
	\$100,000 to \$124,999	35.8%	37.5%	54.2%	8.3%	70.1%	7.5%
	\$125,000 to \$149,999	48.5%	56.3%	75.0%	33.3%	66.7%	10.6%
	\$150,000 to \$174,999	47.4%	72.2%	66.7%	50.0%	86.8%	15.8%
	\$175,000 to \$199,999	43.5%	80.0%	90.0%	60.0%	87.0%	13.0%
	\$200,000 or greater	47.9%	26.1%	69.6%	34.8%	70.8%	6.3%

Figure 13. Men had higher rates of home car washing than women and as did participants who owned homes.

Table 14. Veh	icle washing	behaviors b	by demogr	aphic group.
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Demographic	Sub-category	Wash Car at Home	Wash Car in Grass, Gravel, or Dirt	Wash Car using Environmentally Friendly Detergent	Wash Car using only Water (No Soap)	Wash Car at Commercial Location	Have not Washed Car in Past Year
	All Respondents	21.0%	52.6%	60.3%	28.5%	63.1%	9.3%
Gender	Male	47.2%	53.8%	66.2%	33.6%	66.0%	9.4%
	Female	29.5%	50.6%	50.0%	20.0%	60.5%	8.9%
Age	21 to 24	49.5%	58.3%	57.4%	24.5%	47.5%	10.1%
	25 to 34	37.0%	60.9%	59.4%	26.6%	64.2%	9.2%
	35 to 44	45.8%	57.7%	67.6%	40.0%	68.4%	10.3%
	45 to 54	26.0%	36.8%	52.6%	31.6%	72.6%	8.2%
	55 to 64	24.5%	15.4%	46.2%	0.0%	66.0%	13.2%
	65 to 74	34.2%	23.1%	61.5%	16.7%	55.3%	0.0%
	75 or older	25.0%	50.0%	50.0%	0.0%	62.5%	12.5%
Locality	Alexandria	36.2%	52.9%	48.5%	26.5%	58.5%	6.4%
	Arlington	25.0%	55.6%	66.7%	16.7%	56.9%	11.1%

Demographic	Sub-category	Wash Car at Home	Wash Car in Grass, Gravel, or Dirt	Wash Car using Environmentally Friendly Detergent	Wash Car using only Water (No Soap)	Wash Car at Commercial Location	Have not Washed Car in Past Year
	Fairfax - Inclusive	45.1%	51.0%	63.7%	31.7%	58.8%	10.2%
	Prince William - Inclusive	39.1%	34.1%	50.0%	17.8%	67.8%	7.0%
	Leesburg/Loudon	34.8%	81.3%	71.9%	43.3%	77.2%	12.0%
Ethnicity	Hispanic/Latino	35.1%	40.7%	40.7%	18.5%	54.5%	11.7%
	Not Hispanic/Latino	39.1%	54.2%	62.9%	29.9%	64.4%	9.0%
Years of	Less than 1 year	21.6%	60.0%	80.0%	31.3%	58.1%	10.8%
Residence	1 to 3 years	37.1%	50.8%	58.7%	28.6%	62.4%	8.8%
	4 to 9 years	41.4%	50.8%	56.3%	25.4%	68.2%	9.6%
	10 to 19 years	50.0%	60.4%	54.2%	39.6%	56.3%	14.6%
	20 or more years	38.2%	46.2%	69.2%	18.4%	66.7%	3.9%
Home	Owned	46.8%	50.9%	65.6%	31.9%	66.8%	10.4%
Ownership	Rented	27.4%	56.9%	47.7%	18.8%	59.9%	5.9%
Household Income	Less than \$35,000	19.2%	69.2%	46.2%	21.4%	37.0%	9.6%
	\$35,000 to \$49,999	33.8%	50.0%	63.6%	28.6%	53.8%	12.3%
	\$50,000 to \$74,999	37.8%	55.6%	48.9%	20.0%	65.5%	9.2%
	\$75,000 to \$99,999	43.0%	51.2%	52.4%	27.9%	60.0%	6.0%
	\$100,000 to \$124,999	35.8%	37.5%	54.2%	8.3%	70.1%	7.5%
	\$125,000 to \$149,999	48.5%	56.3%	75.0%	33.3%	66.7%	10.6%
	\$150,000 to \$174,999	47.4%	72.2%	66.7%	50.0%	86.8%	15.8%
	\$175,000 to \$199,999	43.5%	80.0%	90.0%	60.0%	87.0%	13.0%
	\$200,000 or greater	47.9%	26.1%	69.6%	34.8%	70.8%	6.3%

Figure 13. Vehicle washing locations.



Figure 14. Desirable behaviors associated with vehicle washing.





Year of Survey										
Vehicle washing behavior	2018	2019	2020	2021	2022	2023				
Wash on grass, gravel or dirt	18.8%	27.7%	40.1%	41.0%	36.0%	52.6%				
Use environmentally friendly detergent	45.6%	39.9%	49.2%	47.5%	51.7%	60.3%				
Use water only	10.7%	10.1%	9.6%	8.0%	10.0%	28.5%				

* *Red font* indicates that the value significantly differs from the current 2023 value.

Figure 15. Vehicle washing behaviors across years.



Those who reported washing their vehicle at home were asked about their behaviors when washing their car. Response options were "Yes", "No", and "Not sure" for the following statements:

- I wash it on the grass, gravel, or dirt
- I use environmentally friendly detergent
- I use water only (no soap or detergent)

Of the 21.0% of respondents that wash their vehicle at home, 52.6% report washing it on the grass, gravel, or dirt (Table 14 and Figure 14). Additionally, 60.3% report using environmentally friendly detergent. Homeowners had higher rates of using environmentally friendly detergent when compared to renters, as did non-Latino participants when compared to Latino participants, and men when compared to women. Finally, 28.5% report only using water with higher rates for men than women and higher rates for non-Latino than Latino participants. These results suggest that people may wash their vehicle using multiple different methods depending on certain circumstances.

Alternatively, 63.1% report washing their vehicle at a commercial car wash. People from higher income groups have higher rates of washing their car at a commercial location when compared to lower income groups.

Next, those who report washing their vehicle at home were asked how many times per year they do so, with response options being "Less than once a year", "1-2 times per year", "3-4 times per year", "5-6 times per year", "7-12 times per year", "12+ times per year". These response rates can be seen in Table 16 and Figure 16. The most common response, at 26.1%, was 3-4 times per year. Next, 22.6% report washing their vehicle at home 1-2 times per year, and 17.8% do so 5-6 times per year. Less commonly, 16.5% of those who wash their personal vehicle at home report doing so 12+ times per year, 11.7% report doing so 7-12 times per year, and 5.2% do so less than once per year. Latino participants have higher rates of washing their car at home 12+ times per year when compared to non-Latinos, 40.7% compared to 13.3% respectively. There are otherwise no strong demographic trends among frequency of home car washing.

Demographic	Sub-category	Frequency of Car Washing at Home					
		Less than once a year	1-2 times per year	3-4 times per year	5-6 times per year	7-12 times per year	12+ times per year
	All Respondents	5.2%	22.6%	26.1%	17.8%	11.7%	16.5%
Gender	Male	4.8%	22.1%	25.5%	20.0%	11.0%	16.6%
	Female	6.0%	24.1%	27.7%	14.5%	12.0%	15.7%
Age	21 to 24	8.2%	28.6%	26.5%	12.2%	12.2%	12.2%
	25 to 34	3.1%	25.0%	26.6%	15.6%	9.4%	20.3%
	35 to 44	5.7%	15.7%	22.9%	24.3%	11.4%	20.0%
	45 to 54	10.5%	21.1%	31.6%	10.5%	21.1%	5.3%
	55 to 64	0.0%	23.1%	23.1%	15.4%	15.4%	23.1%
	65 to 74	0.0%	23.1%	38.5%	23.1%	7.7%	7.7%
	75 or older	0.0%	50.0%	0.0%	50.0%	0.0%	0.0%
Locality	Alexandria	8.8%	17.6%	23.5%	11.8%	8.8%	29.4%
	Arlington	11.1%	22.2%	33.3%	11.1%	5.6%	16.7%
	Fairfax - Inclusive	4.9%	26.5%	22.5%	16.7%	11.8%	17.6%

Table 16. Frequency of car washing at home by demographic group.
Demographic	Sub-category		Free	quency of Car	Washing at H	ome	
		Less than once a year	1-2 times per year	3-4 times per year	5-6 times per year	7-12 times per year	12+ times per year
	Prince William - Inclusive	2.2%	26.7%	35.6%	15.6%	11.1%	8.9%
	Leesburg/Loudon	3.2%	9.7%	22.6%	35.5%	19.4%	9.7%
Ethnicity	Hispanic/Latino	3.7%	14.8%	7.4%	22.2%	11.1%	40.7%
	Not Hispanic/Latino	5.4%	23.6%	28.6%	17.2%	11.8%	13.3%
Years of	Less than 1 year	18.8%	18.8%	18.8%	0.0%	31.3%	12.5%
Residence	1 to 3 years	6.3%	27.0%	27.0%	15.9%	4.8%	19.0%
	4 to 9 years	3.1%	26.2%	27.7%	13.8%	9.2%	20.0%
	10 to 19 years	4.3%	17.0%	19.1%	29.8%	19.1%	10.6%
	20 or more years	2.6%	17.9%	33.3%	20.5%	10.3%	15.4%
Home	Owned	4.3%	23.6%	26.1%	20.5%	9.9%	15.5%
Ownership	Rented	6.2%	20.0%	27.7%	9.2%	16.9%	20.0%
Household Income	Less than \$35,000	14.3%	28.6%	35.7%	0.0%	14.3%	7.1%
	\$35,000 to \$49,999	4.5%	13.6%	27.3%	13.6%	22.7%	18.2%
	\$50,000 to \$74,999	4.4%	28.9%	11.1%	20.0%	17.8%	17.8%
	\$75,000 to \$99,999	4.7%	25.6%	23.3%	11.6%	9.3%	25.6%
	\$100,000 to \$124,999	0.0%	12.5%	50.0%	16.7%	0.0%	20.8%
	\$125,000 to \$149,999	6.3%	31.3%	28.1%	18.8%	3.1%	12.5%
	\$150,000 to \$174,999	5.9%	5.9%	35.3%	17.6%	17.6%	17.6%
	\$175,000 to \$199,999	10.0%	20.0%	10.0%	50.0%	10.0%	0.0%
	\$200,000 or greater	4.3%	21.7%	26.1%	26.1%	13.0%	8.7%

Figure 16. Frequency of car washing at home.



2.3.7 Home Landscaping Water Conservation

Respondents were asked about their familiarity with and possession of various water conservation methods including rain barrels, rain gardens, and conservation landscaping. Results are summarized in Table 17 and displayed in Figure 17. Survey participants were given a definition of each conservation method and asked "Which of the following statements are true for you?" with response options "Yes", "No", and "Don't know" for the listed statements (using rain barrels as an example):

- I have a rain barrel.
- I am familiar with rain barrels.
- I don't have a rain barrel but I'm interested in getting one.

When asked about rain barrels, 27.7% report having one, 70.7% report being familiar with them, and 44.9% are interested in getting one. Regarding rain gardens, 25.5% have one, 50.5% are familiar with them and 41.6% are interested in getting one. Finally, when asked about their familiarity with conservation landscaping, 37.1% report having it, 59.1% report being familiar with it and 42.0% report being interested in installing it.

Demographic	Sub- category	Have Rain Barrel	Familiar with Rain Barrel	Want a Rain Barrel	Have Rain Garden	Familiar with Rain Garden	Want a Rain Garden	Have Conser vation Landsc aping	Famili ar with Conser vation Landsc aping	Want Conser vation Landsc aping
	All Respondents	27.7%	70.7%	44.9%	25.5%	50.5%	41.6%	37.1%	59.1%	42.0%
Gender	Male	36.1%	74.2%	45.0%	34.8%	56.1%	43.0%	44.3%	64.0%	42.0%
	Female	18.5%	67.5%	44.8%	15.0%	44.0%	40.0%	29.1%	53.6%	41.2%
Age	21 to 24	29.9%	58.8%	46.9%	30.2%	53.1%	48.4%	43.3%	62.6%	42.7%
	25 to 34	28.1%	68.2%	44.4%	28.7%	54.1%	42.5%	35.7%	58.8%	38.9%
	35 to 44	39.7%	74.7%	53.0%	33.1%	55.3%	48.0%	43.1%	62.5%	54.3%
	45 to 54	21.1%	77.1%	47.1%	17.8%	39.7%	37.5%	30.1%	54.2%	41.7%
	55 to 64	11.5%	69.2%	32.0%	5.9%	40.4%	28.0%	28.0%	51.0%	29.2%
	65 to 74	11.4%	86.5%	27.3%	14.7%	48.6%	21.2%	33.3%	62.9%	25.0%
	75 or older	0.0%	75.0%	12.5%	0.0%	25.0%	25.0%	12.5%	37.5%	12.5%
Locality	Alexandria	30.1%	73.6%	42.9%	26.1%	47.8%	46.7%	33.0%	52.7%	43.5%
	Arlington	26.5%	70.0%	40.3%	28.6%	59.2%	35.7%	36.2%	60.0%	40.6%
	Fairfax - Inclusive	29.2%	68.9%	46.3%	27.1%	51.1%	41.9%	39.0%	58.1%	42.6%
	Prince William - Inclusive	18.4%	67.5%	47.3%	15.8%	47.0%	42.9%	28.8%	58.6%	35.8%
	Leesburg/Lo udon	34.1%	76.7%	43.8%	31.1%	49.5%	38.6%	47.3%	68.5%	47.7%
Ethnicity	Hispanic/Lati no	24.0%	59.5%	41.9%	22.7%	46.1%	42.5%	36.5%	59.5%	37.5%
	Not Hispanic/Lati no	28.2%	72.4%	45.3%	25.9%	51.2%	41.4%	37.2%	59.1%	42.6%
Years of Residence	Less than 1 year	16.7%	61.4%	45.8%	20.5%	45.8%	38.9%	28.2%	54.9%	44.3%
	1 to 3 years	20.5%	67.9%	46.1%	18.1%	48.5%	42.7%	29.2%	60.7%	41.2%
	4 to 9 years	32.1%	72.4%	46.1%	29.0%	55.2%	45.8%	46.8%	64.1%	41.8%
	10 to 19 years	31.1%	69.9%	50.0%	32.2%	48.9%	40.0%	39.1%	54.3%	49.5%
	20 or more years	37.6%	80.0%	35.4%	30.0%	51.5%	36.5%	39.6%	56.1%	34.7%
Home	Ówned	33.9%	75.5%	48.0%	30.1%	52.4%	42.9%	46.3%	63.4%	45.3%
Ownership	Rented	16.9%	65.5%	39.2%	18.5%	46.8%	37.9%	24.4%	54.3%	35.2%
Household Income	Less than \$35,000	21.1%	63.4%	50.0%	19.7%	39.4%	36.2%	25.7%	41.4%	42.0%
	\$35,000 to \$49,999	18.5%	61.5%	33.8%	25.0%	48.4%	39.1%	30.8%	55.4%	37.5%
	\$50,000 to \$74,999	25.0%	69.3%	46.0%	21.9%	46.6%	47.0%	35.1%	51.7%	40.0%
	\$75,000 to \$99,999	29.2%	70.1%	49.5%	28.9%	58.2%	40.6%	40.8%	70.1%	41.5%

Table 17. Familiarity of home water conservation methods by demographic group.

Demographic	Sub- category	Have Rain Barrel	Familiar with Rain Barrel	Want a Rain Barrel	Have Rain Garden	Familiar with Rain Garden	Want a Rain Garden	Have Conser vation Landsc aping	Famili ar with Conser vation Landsc aping	Want Conser vation Landsc aping
	\$100,000 to \$124,999	16.4%	64.6%	37.9%	15.4%	37.9%	36.9%	31.3%	51.5%	37.3%
	\$125,000 to \$149,999	39.4%	84.4%	51.6%	30.8%	65.6%	55.6%	42.4%	73.8%	58.1%
	\$150,000 to \$174,999	50.0%	71.1%	43.2%	44.7%	52.6%	33.3%	55.3%	71.1%	41.7%
	\$175,000 to \$199,999	50.0%	87.0%	52.2%	40.9%	63.6%	36.4%	52.2%	78.3%	56.5%
	\$200,000 or greater	25.0%	80.9%	39.1%	20.8%	53.2%	37.8%	38.3%	57.8%	31.8%

Figure 17. Familiarity with home water conservation methods.



10% 20% 30% 40% 50% 60% 70% 80%

Percent Agreement

Men are more likely than women to report having a rain barrel or rain garden or conservation landscaping, as are homeowners when compared to renters. Additionally, younger individuals are more likely to report having a rain barrel or rain garden. There are no differences across age groups when it comes to having conservation landscaping.

2.3.8 Engagement in Water Quality Improvement Activities

Respondents were asked about their awareness of and engagement in community activities that promote better water quality in the past 12 months. Results are summarized in Table 18 and displayed in Figure 18. When asked about their familiarity with water quality activities, 33.2% report being aware of a water quality activity in the past 12 months. There are no trends among demographic subgroups.

Demographic	Sub-category	Aware of Water Quality Activity in Last 12 Months	Participated in Cleanup Activity in Last 12 Months	
	All Respondents	33.2%	68.5%	
Gender	Male	39.4%	76.0%	
	Female	26.7%	56.8%	
Age	21 to 24	46.9%	64.4%	
	25 to 34	32.4%	71.4%	
	35 to 44	35.7%	83.6%	
	45 to 54	21.9%	68.8%	
	55 to 64	28.3%	26.7%	
	65 to 74	24.3%	44.4%	
	75 or older	12.5%	100.0%	
Locality	Alexandria	30.1%	60.7%	
	Arlington	38.9%	53.6%	
	Fairfax - Inclusive	36.4%	71.6%	
	Prince William - Inclusive	25.2%	72.4%	
	Leesburg/Loudon	34.1%	77.4%	
Ethnicity	Hispanic/Latino	31.2%	73.9%	
	Not Hispanic/Latino	33.5%	67.8%	
Years of Residence	Less than 1 year	25.7%	47.4%	
	1 to 3 years	29.4%	69.4%	
	4 to 9 years	34.0%	77.4%	
	10 to 19 years	35.8%	67.6%	
	20 or more years	41.6%	66.7%	
Home Ownership	Owned	38.1%	73.3%	
	Rented	26.2%	57.4%	
Household Income	Less than \$35,000	21.9%	75.0%	
	\$35,000 to \$49,999	33.8%	77.3%	
	\$50,000 to \$74,999	30.3%	66.7%	

Table 18. Cleanup engagement behaviors by demographic group.

Demographic	Sub-category	Aware of Water Quality Activity in Last 12 Months	Participated in Cleanup Activity in Last 12 Months	
	\$75,000 to \$99,999	36.4%	68.6%	
	\$100,000 to \$124,999	25.4%	47.1%	
	\$125,000 to \$149,999	42.4%	67.9%	
	\$150,000 to \$174,999	44.7%	76.5%	
	\$175,000 to \$199,999	63.6%	71.4%	
	\$200,000 or greater	25.5%	66.7%	

Figure 18. Cleanup activity engagement.



Of those who were aware of an event in the past 12 months, 68.5% report participating in the event. There are no trends among demographic subgroups.

As discussed in the Knowledge Section below, about two-thirds (63.4%) of respondents say they would report a potential source of water pollution. Reporting potential pollution will be discussed in more detail in the next section.

2.4 Knowledge

2.4.3 Awareness of "Watersheds"

Respondents were asked a series of questions in order to assess their knowledge about local water systems and stormwater drainage. Participants were asked if they were familiar with the

term "watershed". Regardless of the response (yes or no), all respondents were then shown this definition of the term:

• A watershed is an area of land that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean.

Of all respondents, 69.2% report that they are familiar with the term "watershed", as can be seen in Table 19 and * *Red font indicates significant differences within a demographic subgroup*.

Figure 19. Men are more likely to be familiar with the term (75.5%) compared to women (63.2%). Homeowners are also more likely to be familiar with the term (74.8%) compared to renters (61.7%). Respondents whose household income is above \$35,000 were more often familiar with the term "watershed" compared to those who make under \$35,000 (50.0%).

Demographic	Sub-category	Know term "water shed"	Waste Water Treatment	Chesapeake or Potomac Watershed	Stream Creek Watershed	Knows if Locality has Location for HHW
	All Respondents	69.2%	45.6%	61.6%	57.1%	60.7%
Gender	Male	75.5%	51.8%	66.2%	55.7%	68.8%
	Female	63.2%	39.2%	56.0%	57.9%	52.7%
Age	21 to 24	77.8%	43.9%	59.6%	56.6%	54.5%
	25 to 34	67.4%	50.3%	64.3%	54.2%	49.7%
	35 to 44	68.6%	51.0%	66.0%	57.8%	67.5%
	45 to 54	58.3%	34.2%	47.2%	52.8%	64.4%
	55 to 64	73.6%	38.0%	58.8%	67.3%	73.6%
	65 to 74	68.4%	41.7%	69.7%	65.7%	68.4%
	75 or older	87.5%	33.3%	62.5%	50.0%	87.5%
Locality	Alexandria	68.1%	51.6%	63.7%	58.9%	51.6%
	Arlington	61.4%	42.6%	67.1%	55.2%	52.8%
	Fairfax - Inclusive	73.2%	45.5%	60.6%	57.1%	63.6%
	Prince William - Inclusive	66.1%	41.6%	60.0%	57.1%	64.9%
	Leesburg/Loudon	70.7%	47.3%	59.6%	56.8%	64.1%
Ethnicity	Hispanic/Latino	69.9%	47.6%	54.7%	52.6%	53.3%

Table 19. Awareness of watersheds and knowledge of stormwater drainage by demographic group.

Demographic	Sub-category	Know term "water shed"	Waste Water Treatment	Chesapeake or Potomac Watershed	Stream Creek Watershed	Knows if Locality has Location for HHW
	Not Hispanic/Latino	64.5%	32.0%	62.6%	57.8%	61.8%
Years of	Less than 1 year	66.2%	43.8%	58.9%	52.1%	46.6%
Residence	1 to 3 years	68.6%	39.9%	59.5%	49.1%	50.0%
	4 to 9 years	66.0%	47.4%	61.6%	57.0%	64.5%
	10 to 19 years	68.1%	48.4%	62.6%	67.0%	67.7%
	20 or more years	78.4%	51.6%	66.3%	65.6%	76.5%
Home	Owned	74.8%	53.9%	67.2%	62.6%	69.6%
Ownership	Rented	61.7%	35.8%	55.5%	49.3%	50.2%
Household	Less than \$35,000	50.0%	39.7%	48.6%	47.1%	45.2%
Income	\$35,000 to \$49,999	70.3%	46.8%	64.5%	48.4%	53.1%
	\$50,000 to \$74,999	67.2%	38.8%	55.7%	49.1%	60.2%
	\$75,000 to \$99,999	70.7%	41.1%	62.5%	58.9%	61.0%
	\$100,000 to \$124,999	71.6%	43.3%	62.7%	58.2%	46.3%
	\$125,000 to \$149,999	75.4%	52.4%	72.7%	62.5%	80.3%
	\$150,000 to \$174,999	73.7%	60.5%	65.8%	73.7%	71.1%
	\$175,000 to \$199,999	82.6%	78.3%	47.8%	69.6%	87.0%
	\$200,000 or greater	77.1%	45.7%	77.3%	71.1%	68.1%

Figure 19. Knowledge of watersheds and HHW.



2.4.4 Understanding of Stormwater Drainage

Participants were asked, "To the best of your knowledge, does storm water eventually end up in...?" and given a list of three destinations as well as an option to write-in another destination not listed. Response options were "Yes", "No", and "Don't know" for the listed destinations:

- A wastewater treatment facility?
- Potomac River or Chesapeake Bay?
- A nearby stream or creek

As seen in Table 19 and **Error! Reference source not found.** nearly a third (30.6%) report b elieving it goes to a wastewater treatment facility, 61.6% report believing it goes into the Chesapeake Bay or Potomac River and 57.1% report believing it goes into a nearby stream or creek. As reported in Behaviors and Behavioral Drivers, 70.7% of respondents report being familiar with rain barrels, 50.5% report being familiar with rain gardens and 59.1% report being familiar with conservation landscaping.





Table 20. Storm water destination beliefs across years.

Year of Survey									
Survey Questions Response	2016	2017	2018	2019	2020	2021	2022	2023	
"Yes" to Do you live in the Potomac River watershed?	43.0%	43.2%	37.2%	40.0%	44.4%	40.8%	36.6%	44.9%	
"A wastewater treatment facility" to [Where does] storm water eventually end up?	13.0%	14.2%	12.0%	14.8%	27.6%	28.8%	26.8%	45.60%	
"Potomac River or Chesapeake Bay" to [Where does] storm water eventually end up?	*	*	62.8%	68.4%	59.4%	60.0%	61.2%	61.6%	

* **Red font** indicates that the value significantly differs from the current 2023 value. Asterisks (*) indicate that the question did not appear in the survey that year.

Figure 21. Storm water destination beliefs across years.



2.4.5 Awareness of Household Hazardous Waste (HHW) Disposal

Participants were also asked whether they knew if their locality has a specific place for residents to drop off Household Hazardous Waste (HHW), with response options being "Yes, I

know whether we have a location for drop-offs" and "No, I'm not sure whether we have a location for drop-offs". When asked about HHW 60.7% of respondents report knowing if their locality has a specific drop off location for it, which can be seen in Table 19 and * *Red font indicates significant differences within a demographic subgroup*.

Figure 19. Finally, 33.2% of respondents have heard about water quality activity in the past 12 months. Men (68.8%) are more likely than women (52.7%) to report knowing if their locality has a location for HHW. Older residents and residents who have lived in a locality longer are more likely to report knowing if the locality has a location for HHW. Homeowners (69.6%) are more likely than renters (50.2%) to report knowing about HHW disposal in their community.

Table 21. Awareness of HHW across years.

Year of Survey	2016	2017	2018	2019	2020	2021	2022	2023
"Yes" to awareness question	*	*	64.0%	64.2%	67.0%	65.0%	66.6%	60.7%

* **Red font** indicates that the value significantly differs from the current 2023 value. Asterisks (*) indicate that the question did not appear in the survey that year.



Figure 22. Awareness of HHW across years.

2.4.6 Identifying the Local Watershed

Survey participants were asked "Do live in the..." and given a list of three watershed areas. Response options were "Yes", "No", and "Don't know" for the listed areas:

- Chesapeake Bay watershed?
- Potomac River watershed?
- Another watershed not listed?

As can be seen in Table 22 and Figure 23, almost one-third (29.7%) report that they live in the Chesapeake Bay watershed, 44.0% report that they live in the Potomac River watershed, and 14.5% report that they live in another watershed that was not listed in the survey. Across all areas men had higher rates of reporting that they lived in a watershed, as did those who own their home. Men reported living in the Chesapeake Bay watershed at a rate of 39.1%, the Potomac River watershed at a rate of 52.8%, and another watershed at a rate of 19.4%. These frequencies are compared to women's response rates being 19.4% in the Chesapeake Bay watershed, 35.0% in the Potomac River watershed, and 8.8% in another watershed. When comparing homeowners to renters, as can be seen in Table 22, 39.2% of homeowners report living in the Potomac River watershed compared to 31.8% of renters, and finally 17.4% of owners report living in another watershed as compared to 10.4% of renters. For reference, a map of the Chesapeake Bay watershed and the Potomac River watershed can be seen below in Figure 24.

Demographic	Sub-category	Chesapeake Bay watershed	Potomac River watershed	Another watershed	
	All Respondents	29.7%	44.9%	14.5%	
Gender	Male	39.1%	52.0%	19.4%	
	Female	19.4%	36.8%	8.8%	
Age	21 to 24	37.1%	37.8%	13.5%	
	25 to 34	30.8%	46.1%	11.7%	
	35 to 44	30.3%	54.0%	24.1%	
	45 to 54	12.7%	33.8%	9.0%	

Table 22. Identifying the local watershed by demographic.

Demographic	Sub-category	Chesapeake Bay watershed	Potomac River watershed	Another watershed	
	55 to 64	26.0%	38.0%	8.9%	
	65 to 74	40.5%	50.0%	10.3%	
	75 or older	28.6%	62.5%	0.0%	
Locality	Alexandria	30.8%	45.6%	13.6%	
	Arlington	22.9%	48.5%	12.7%	
	Fairfax - Inclusive	33.2%	43.6%	15.6%	
	Prince William - Inclusive	23.0%	41.1%	11.0%	
	Leesburg/Loudon	33.7%	50.0%	18.8%	
Ethnicity	Hispanic/Latino	25.0%	39.4%	11.4%	
	Not Hispanic/Latino	30.3%	45.7%	15.0%	
Years of Residence	Less than 1 year	14.1%	32.9%	7.9%	
	1 to 3 years	24.1%	39.0%	9.9%	
	4 to 9 years	28.4%	45.7%	17.4%	
	10 to 19 years	41.7%	48.9%	22.7%	
	20 or more years	41.1%	58.9%	14.8%	
Home Ownership	Owned	39.2%	52.9%	17.4%	
	Rented	16.0%	33.3%	10.4%	
Household Income	Less than \$35,000	19.4%	24.6%	7.4%	
	\$35,000 to \$49,999	21.5%	48.4%	14.8%	
	\$50,000 to \$74,999	19.1%	38.1%	14.0%	
	\$75,000 to \$99,999	30.6%	45.7%	12.1%	
	\$100,000 to \$124,999	30.8%	36.9%	4.6%	
	\$125,000 to \$149,999	41.3%	55.4%	25.0%	
	\$150,000 to \$174,999	43.2%	64.9%	25.7%	
	\$175,000 to \$199,999	56.5%	63.6%	35.0%	
	\$200,000 or greater	40.0%	57.4%	12.8%	

Figure 23. Local watershed identification.



Figure 24. Map of Chesapeake Bay and Potomac River watersheds.¹



¹ Interstate Commission on the Potomac River Basin. (n.d.). *Potomac River Basin Atlas*. Potomac River Basin Atlas - Subwatersheds. https://www.potomacriver.org/Atlas-Maps/Subwatersheds/

2.4.7 Identification of Pollution

Participants were provided with two images, as seen below (Figure 25), and asked if either photo contains a potential source of water pollution, with response options being "Yes", "No", "Not sure", and "Cannot see image". The results are summarized in Table 23 and displayed in Figure 26. When asked about the provided images, 72.4% report that yes, they would consider the images to be a potential source of water pollution. Homeowners were more likely to report the photos contained a potential source of water pollution (76.3%) compared to those who rent their residence (66.7%).

Figure 25. Images shown to participants for assessment of knowledge regarding potential sources of water pollution.





2.4.8 Barriers to Reporting Pollution

Participants were asked if they knew who to contact to report potential water pollution with the response options "I definitely know", "I think I know", "I don't think I know", and "I definitely don't know". They were also asked the likelihood that they would call officials to report potential pollution so it could be investigated with the response options being "I definitely would", "I probably would", "I'm equally likely to call and to not call", "I probably would not", and "I definitely would not". The responses are summarized in Table 23. When asked about who to contact for reporting potential water pollution, 56.5% report

knowing who to contact. Men (67.2%) are more likely than women (44.6%) to indicate knowing who to contact in the case of suspected water pollution. 63.4% report that they would contact someone to report a potential source of water pollution. Men (72.2%) are also more likely to indicate they would contact someone to report a potential source of water pollution than women (53.6%).

Those who reported being equally likely to call and not to call and who reported that they would probably or definitely not call were asked what their primary reason is for not calling. Response options given were "I'm too busy", "It's not my responsibility", "It's none of my business", "I prefer not to communicate with officials or authorities", and an option to write-in another reason not listed. Of these respondents, 31.5% report their reason for not calling being that they'd prefer not to communicate with officials or authorities. Additionally, 23.1% report it being none of their business, 17.6% report that they are too busy, and 17.6% report that it is not their responsibility. These results are summarized in Table 23 and displayed in Figure 27.

Demographic	Sub-category	Water Pollution	Know Who to Contact	Would Call Officials	No Contact Reason						
					Too Busy	Not my Responsibility	None of my Business	Don't Want to Communicate with Authorities	Other		
	All Respondents	79.0%	56.5%	63.4%	17.6%	17.6%	23.1%	31.5%	10.2%		
Gender	Male	80.6%	67.2%	72.2%	14.1%	20.0%	22.4%	38.8%	4.7%		
	Female	77.2%	44.6%	53.6%	20.2%	14.7%	24.0%	27.1%	14.0%		
Age	21 to 24	85.7%	55.7%	51.5%	21.3%	21.3%	21.3%	34.0%	2.1%		
	25 to 34	77.4%	53.5%	59.6%	21.7%	15.9%	24.6%	26.1%	11.6%		
	35 to 44	79.6%	62.6%	69.5%	8.5%	25.5%	23.4%	36.2%	6.4%		
	45 to 54	71.4%	56.9%	65.3%	20.0%	4.0%	16.0%	44.0%	16.0%		

Table 23. Barriers to reporting water pollution by demographic group.

Demographic	Sub-category	Water Pollution	Know Who to Contact	Would Call Officials		N	lo Contact R	eason	
					Too Busy	Not my Responsibility	None of my Business	Don't Want to Communicate with Authorities	Other
	55 to 64	75.5%	41.5%	69.8%	18.8%	12.5%	25.0%	12.5%	31.3%
	65 to 74	83.3%	68.4%	78.9%	14.3%	14.3%	28.6%	28.6%	14.3%
	75 or older	87.5%	50.0%	37.5%	0.0%	20.0%	40.0%	40.0%	0.0%
Locality	Alexandria	72.9%	50.5%	63.8%	9.1%	36.4%	15.2%	27.3%	12.1%
	Arlington	83.6%	66.7%	76.1%	41.2%	17.6%	17.6%	17.6%	5.9%
	Fairfax - Inclusive	80.8%	54.9%	58.7%	16.3%	18.5%	23.9%	30.4%	10.9%
	Prince William - Inclusive	78.0%	57.9%	61.1%	15.9%	6.8%	31.8%	38.6%	6.8%
	Leesburg/Loudo n	78.6%	56.5%	67.4%	20.0%	10.0%	20.0%	36.7%	13.3%
Ethnicity	Hispanic/Latino	78.6%	52.6%	52.0%	13.9%	13.9%	25.0%	33.3%	13.9%
	Not Hispanic/Latino	79.1%	57.0%	65.0%	18.3%	18.3%	22.8%	31.1%	9.4%
Years of	Less than 1 year	83.3%	54.8%	61.6%	28.6%	17.9%	14.3%	28.6%	10.7%
Residence	1 to 3 years	78.9%	52.4%	60.4%	13.4%	19.4%	22.4%	34.3%	10.4%
	4 to 9 years	78.9%	63.9%	64.7%	20.4%	16.7%	20.4%	29.6%	13.0%
	10 to 19 years	80.0%	53.1%	64.2%	14.7%	11.8%	44.1%	26.5%	2.9%
	20 or more years	75.5%	56.4%	66.7%	15.2%	21.2%	15.2%	36.4%	12.1%
Home	Owned	81.6%	61.8%	67.1%	19.5%	16.8%	21.2%	33.6%	8.8%
Ownership	Rented	75.2%	49.6%	59.3%	15.8%	16.8%	23.2%	31.6%	12.6%
Household Income	Less than \$35,000	80.9%	49.3%	56.2%	15.6%	28.1%	21.9%	28.1%	6.3%
	\$35,000 to \$49,999	70.2%	61.5%	58.5%	19.2%	11.5%	23.1%	23.1%	23.1%
	\$50,000 to \$74,999	70.6%	56.8%	71.2%	8.8%	20.6%	23.5%	38.2%	8.8%
	\$75,000 to \$99,999	81.3%	52.0%	58.0%	11.9%	16.7%	35.7%	33.3%	2.4%
	\$100,000 to \$124,999	83.3%	44.8%	58.2%	17.9%	10.7%	21.4%	35.7%	14.3%
	\$125,000 to \$149,999	78.6%	57.6%	69.7%	25.0%	15.0%	20.0%	25.0%	15.0%
	\$150,000 to \$174,999	85.7%	63.2%	59.5%	46.7%	6.7%	20.0%	20.0%	6.7%
	\$175,000 to \$199,999	81.8%	82.6%	78.3%	0.0%	40.0%	0.0%	20.0%	40.0%
	\$200,000 or greater	92.7%	66.0%	67.4%	21.4%	21.4%	7.1%	50.0%	0.0%



Figure 26. Water pollution identification and knowledge.

Figure 27. Barriers to reporting water pollution.



Table 24. Water pollution knowledge across years.

Year of Survey									
Survey Questions Response	2018	2019	2020	2021	2022	2023			
"Yes", would consider pictures water pollution	78.0%	75.2%	79.6%	80.4%	80.8%	72.4%			
"Definitely" or "think" I know who to contact about water pollution	51.6%	42.0%	52.6%	59.2%	58.8%	56.5%			
"Definitely" or "probably" would contact about water pollution	41.6%	38.0%	44.0%	53.4%	52.4%	63.4%			

* *Red font* indicates that the value significantly differs from the current 2023 value.

Figure 28. Water pollution knowledge across years.



2.5 Campaign Perceptions

2.5.3 Campaign Awareness

Survey participants were asked questions to better understand their level of awareness of water pollution campaigns; their responses are below in Table 25 and Figure 30. Respondents were provided with the logo depicted in Figure 29 and asked if they had seen the logo before. Of respondents, 60.7% report having previously seen the provided logo. Respondents with a longer

Figure 29. Logo provided to survey participants.



tenure in their homes were more likely to have seen the logo previously than people with shorter tenures. Homeowners (69.3%) are more likely to have seen the logo than renters (48.5%).

Demographic	Sub-category	Seen the Logo Previously	Seen Water Pollution Reduction Campaign	
	All Respondents	60.7%	34.1%	
Gender	Male	65.5%	40.2%	
	Female	56.1%	27.8%	
Age	21 to 24	61.6%	44.4%	
	25 to 34	60.1%	35.9%	
	35 to 44	63.6%	39.0%	
	45 to 54	54.8%	24.7%	
	55 to 64	59.6%	19.6%	
	65 to 74	68.4%	16.2%	
	75 or older	28.6%	37.5%	
Locality	Alexandria	56.4%	32.3%	
	Arlington	59.7%	40.8%	
	Fairfax - Inclusive	66.4%	37.5%	
	Prince William - Inclusive	54.8%	29.2%	
	Leesburg/Loudon	59.8%	28.6%	

Table 25. Percentage of respondents who have seen campaigns by demographic group.

Demographic	Sub-category	Seen the Logo Previously	Seen Water Pollution Reduction Campaign
Ethnicity	Hispanic/Latino	55.8%	31.6%
	Not Hispanic/Latino	61.5%	34.5%
Years of Residence	Less than 1 year	56.8%	31.5%
	1 to 3 years	47.6%	30.2%
	4 to 9 years	64.3%	34.8%
	10 to 19 years	67.4%	37.6%
	20 or more years	73.5%	38.2%
Home Ownership	Owned	69.3%	38.3%
	Rented	48.5%	27.4%
Household Income	Less than \$35,000	47.2%	28.2%
	\$35,000 to \$49,999	56.3%	34.9%
	\$50,000 to \$74,999	53.8%	32.2%
	\$75,000 to \$99,999	57.6%	35.0%
	\$100,000 to \$124,999	67.2%	22.7%
	\$125,000 to \$149,999	69.7%	42.4%
	\$150,000 to \$174,999	71.1%	47.4%
	\$175,000 to \$199,999	78.3%	47.8%
	\$200,000 or greater	72.9%	31.9%



Figure 30. Water pollution reduction campaign awareness.

Table 26. Logo recognition across years.

Year of Survey	2016	2017	2018	2019	2020	2021	2022	2023
Recognizes Logo	61.2%	62.4%	58.8%	57.0%	61.0%	61.4%	65.8%	60.7%

* *Red font* indicates that the value significantly differs from the current 2023 value.





Additionally, as described previously, 33.2% report being aware of a water quality activity in the past 12 months. Lastly, respondents were asked if they have seen or received information

about reducing water pollution from any source in the past 12 months, with 34.1% of respondents reporting yes, they have seen or received this kind of information. Men (40.2%) are much more likely to have seen this information than women (27.8%). Homeowners (38.3%) are more likely to have received information about reducing water pollution than renters (27.4%).

Survey participants were shown both the "Only Rain Down the Drain" and "Cleaner Streets Means Cleaner Water" advertisements in a random order and asked questions about both of them. Some participants report not being able to see one or both of the videos, in which case their data was excluded from analysis for these questions.

2.5.3.1 Only Rain Down the Drain (ORDD)

Participants were shown the advertisement "Only Rain Down the Drain" (ORDD) and asked a series of questions about it. First, participants were asked if they had seen the ad or a similar one on TV, Facebook, or Twitter and given the response options "Yes", "No", "Not sure", and "Video did not play". After seeing the ORDD advertisement, 23.3% of respondents report having seen the ad previously, as can be seen in Table 27 and Figure 32. Men (30.8%) were more likely to have seen the ad previously than women (15.2%). Participants were then asked about their perceptions of the ad by listing a series of statements with the option to "Strongly disagree", "Disagree", "Neither disagree nor agree", "Agree", and "Strongly Agree". The statements were:

- I understand the information in the ad.
- The ad is relevant to me.
- I trust the information in the ad.
- The ad's message is important.
- The ad is persuasive.
- I think the ad would be effective.

In response to these statements, 79.4% report understanding the information in the ad, 70.7% report believing that the ad is relevant, 78.9% report trusting the information in the ad, 84.2%

report thinking the information in the ad is important, 68.5% report believing the ad is persuasive, and 73.0% think the ad is effective. The full results are displayed in Figure 33.

Demographic	Sub-category	Recognize Ad	Understand Ad	Ad is Relevant	Trust Ad	Ad is Important	Ad is Persuasive	Ad is Effective
	All Respondents	23.3%	79.4%	70.7%	78.9%	84.2%	68.5%	73.0%
Gender	Male	30.8%	79.0%	72.8%	81.0%	84.6%	71.9%	76.5%
	Female	15.2%	80.4%	69.7%	76.9%	84.1%	65.5%	69.8%
Age	21 to 24	29.4%	75.3%	65.1%	81.7%	82.7%	75.3%	75.0%
	25 to 34	25.5%	77.6%	74.3%	75.5%	81.1%	60.8%	72.0%
	35 to 44	27.1%	78.4%	71.5%	81.1%	85.7%	74.6%	74.6%
	45 to 54	16.7%	79.7%	69.6%	76.8%	83.9%	64.3%	71.4%
	55 to 64	2.3%	84.8%	65.1%	76.7%	86.0%	60.5%	65.9%
	65 to 74	16.7%	90.0%	71.9%	82.8%	90.0%	76.7%	76.7%
	75 or older	37.5%	100.0%	85.7%	85.7%	100.0%	83.3%	83.3%
Locality	Alexandria	32.9%	78.9%	61.5%	74.7%	85.3%	66.7%	73.3%
	Arlington	14.0%	78.7%	77.2%	80.4%	83.9%	71.4%	75.0%
	Fairfax - Inclusive	26.3%	79.0%	72.9%	78.7%	83.4%	68.8%	69.0%
	Prince William - Inclusive	17.0%	74.5%	65.9%	72.5%	79.1%	68.1%	72.5%
	Leesburg/Loudon	20.5%	87.2%	75.3%	89.6%	90.9%	67.5%	81.6%
Ethnicity	Hispanic/Latino	21.0%	81.5%	65.1%	73.0%	83.6%	59.0%	68.9%
	Not Hispanic/Latino	23.6%	79.1%	71.5%	79.7%	84.2%	69.8%	73.6%
Years of	Less than 1 year	15.3%	66.7%	66.7%	71.7%	76.7%	63.3%	63.3%
Residence	1 to 3 years	17.2%	78.1%	72.2%	77.4%	82.4%	67.9%	74.0%
	4 to 9 years	26.8%	81.7%	67.6%	80.1%	85.3%	66.2%	73.3%
	10 to 19 years	27.3%	79.5%	71.1%	79.7%	85.1%	68.9%	69.9%
	20 or more years	28.6%	86.5%	75.9%	83.3%	89.4%	76.2%	80.7%
Home	Owned	27.5%	83.9%	76.7%	83.7%	88.7%	73.9%	78.6%
Ownership	Rented	15.1%	74.1%	64.8%	74.0%	79.2%	61.5%	66.7%
Household Income	Less than \$35,000	16.4%	75.4%	55.0%	66.1%	74.6%	64.4%	60.3%
	\$35,000 to \$49,999	18.4%	79.2%	68.6%	76.5%	80.4%	64.7%	74.5%
	\$50,000 to \$74,999	23.2%	75.2%	73.2%	79.4%	85.3%	71.6%	77.7%
	\$75,000 to \$99,999	23.6%	74.2%	72.1%	79.5%	83.3%	67.5%	72.3%
	\$100,000 to \$124,999	14.8%	76.3%	70.7%	77.2%	80.7%	61.4%	70.2%
	\$125,000 to \$149,999	24.1%	91.1%	80.0%	84.9%	92.5%	75.5%	84.6%
	\$150,000 to \$174,999	46.9%	78.8%	67.7%	77.4%	90.3%	64.5%	74.2%

Table 27. Perceptions of 'Only Rain Down the Drain' (ORDD) advertisement by demographics.

Demographic	Sub-category	Recognize Ad	Understand Ad	Ad is Relevant	Trust Ad	Ad is Important	Ad is Persuasive	Ad is Effective
	\$175,000 to \$199,999	36.8%	89.5%	72.2%	88.9%	83.3%	72.2%	72.2%
	\$200,000 or greater	24.3%	92.1%	76.9%	89.5%	92.1%	76.3%	68.4%

Figure 32. Recognition of 'Cleaner Streets Means Cleaner Water' and 'Only Rain Down the Drain' advertisement.



Figure 33.Perceptions of 'Only Rain Down the Drain' and 'Cleaner Streets Means Cleaner Water' advertisement.



2.5.3.2 Cleaner Streets Means Cleaner Water (CSMCW)

Participants were shown the ad "Cleaner Streets Means Cleaner Water" (CSMCW) and asked a series of questions about it. First, participants were asked if they had seen the ad or a similar one on TV, Facebook, or Twitter and given the response options "Yes", "No", "Not sure", and "Video did not play". After seeing the CSMCW ad, 29.6% of respondents report having seen the ad previously, as shown in Table 28 and Figure 32. Men (36.2%) were more likely to report having seen the ad previously than women (22.8%). Participants were then asked about their perceptions of the ad by listing a series of statements with the option to "Strongly disagree", "Disagree", "Neither disagree nor agree", "Agree", and "Strongly Agree". The statements were:

- I understand the information in the ad.
- The ad is relevant to me.
- I trust the information in the ad.
- The ad's message is important.
- The ad is persuasive.
- I think the ad would be effective.

In response to these statements, 81.7% of respondents report understanding the ad, 71.6% report believing the ad is relevant, 79.7% report trusting the information in the ad, 85.5% report thinking the information in the ad is important and 72.1% report believing the ad is persuasive, and 77.0% report thinking the ad is effective. The full results are displayed in Figure 33.

Table 28. Perceptions of 'Cleaner Streets Means Cleaner Water' (CSMCW) advertisement by demographic group.

Demographic	Sub-category	Recognize Ad	Understand Ad	Ad is Relevant	Trust Ad	Ad is Important	Ad is Persuasive	Ad is Effective
	All Respondents	29.6%	81.7%	71.6%	79.7%	85.5%	72.1%	77.0%
Gender	Male	36.2%	81.6%	73.8%	80.2%	85.3%	74.6%	80.7%
	Female	22.8%	83.1%	70.0%	80.0%	86.8%	69.8%	73.5%
Age	21 to 24	28.9%	81.2%	60.2%	79.0%	85.4%	65.9%	72.0%
	25 to 34	32.2%	80.4%	72.4%	76.4%	84.7%	68.5%	74.1%
	35 to 44	32.3%	80.2%	71.2%	80.5%	85.1%	74.6%	77.7%
	45 to 54	19.3%	81.3%	74.6%	78.0%	83.1%	74.6%	81.0%
	55 to 64	17.8%	84.4%	75.0%	84.1%	86.4%	79.1%	74.4%
	65 to 74	33.3%	93.9%	87.9%	91.2%	93.9%	83.3%	93.8%
	75 or older	75.0%	75.0%	75.0%	75.0%	87.5%	62.5%	87.5%
Locality	Alexandria	32.9%	74.1%	64.2%	72.0%	80.2%	65.4%	72.8%
	Arlington	32.3%	84.1%	78.3%	80.0%	90.0%	71.9%	80.7%
	Fairfax - Inclusive	37.6%	82.3%	72.0%	82.5%	86.3%	73.5%	75.4%
	Prince William - Inclusive	15.7%	84.2%	69.2%	76.7%	81.1%	70.0%	80.9%
	Leesburg/Loudon	21.3%	83.5%	75.9%	84.6%	91.0%	78.2%	77.9%
Ethnicity	Hispanic/Latino	32.4%	85.9%	67.6%	86.6%	92.5%	67.7%	74.2%
	Not Hispanic/Latino	29.2%	81.0%	72.3%	78.6%	84.4%	72.7%	77.4%
Years of	Less than 1 year	24.6%	77.0%	67.8%	79.7%	82.8%	71.2%	78.0%
Residence	1 to 3 years	23.3%	84.5%	72.1%	80.1%	86.8%	70.9%	73.3%
	4 to 9 years	31.2%	77.5%	67.4%	77.1%	84.1%	72.0%	80.9%
	10 to 19 years	26.6%	81.7%	71.6%	77.5%	83.8%	67.1%	70.9%
	20 or more years	43.5%	87.4%	80.2%	85.1%	89.4%	79.5%	81.9%
Home	Owned	31.6%	85.7%	76.3%	83.0%	87.9%	77.9%	81.5%
Ownership	Rented	27.3%	78.5%	67.0%	77.0%	84.2%	65.6%	72.7%
Household Income	Less than \$35,000	32.3%	75.8%	58.6%	72.4%	82.8%	64.9%	75.0%
	\$35,000 to \$49,999	34.7%	76.4%	72.2%	78.8%	81.1%	71.7%	75.5%
	\$50,000 to \$74,999	25.5%	86.5%	74.3%	84.2%	88.1%	75.0%	82.0%

Demographic	Sub-category	Recognize Ad	Understand Ad	Ad is Relevant	Trust Ad	Ad is Important	Ad is Persuasive	Ad is Effective
	\$75,000 to \$99,999	29.1%	75.9%	68.4%	71.8%	79.2%	68.8%	71.8%
	\$100,000 to \$124,999	16.4%	76.7%	67.2%	79.3%	84.5%	65.5%	72.4%
	\$125,000 to \$149,999	36.2%	86.2%	78.0%	86.2%	91.2%	73.7%	78.9%
	\$150,000 to \$174,999	40.0%	83.3%	70.0%	79.3%	86.2%	78.6%	78.6%
	\$175,000 to \$199,999	44.4%	94.4%	72.2%	72.2%	88.9%	77.8%	83.3%
	\$200,000 or greater	25.0%	92.5%	87.5%	90.2%	92.5%	82.1%	79.5%

2.5.4 Campaign Impact

Survey participants who reported recognizing one or both advertisements were asked a series of questions about the potential impact of the ad(s) on their behaviors.

2.5.4.1 Impact of advertisements on pet waste clean-up

Respondents were asked how certain behaviors have changed since they first saw the ad(s), if they had seen the advertisements prior to the current survey. The first set of questions asked about their current pet waste disposal behaviors, the results of which can be seen in Table 29 and

Demographic	Sub-category	Understands Pet Waste	Want Pet Waste	More Pet Waste	Pet Waste Already
	All Respondents	72.6%	42.5%	42.4%	58.5%
Gender	Male	74.6%	51.1%	51.5%	63.3%
	Female	71.0%	33.6%	32.3%	53.1%
Age	21 to 24	80.4%	59.4%	51.6%	67.7%
	25 to 34	72.4%	43.9%	44.6%	65.7%
	35 to 44	71.0%	49.7%	53.6%	61.5%
	45 to 54	76.4%	38.0%	38.6%	47.9%
	55 to 64	67.9%	17.0%	17.0%	37.7%
	65 to 74	63.9%	13.9%	11.4%	41.7%
	75 or older	50.0%	12.5%	12.5%	50.0%

Demographic	Sub-category	Understands Pet Waste	Want Pet Waste	More Pet Waste	Pet Waste Already
Locality	Alexandria	74.2%	42.9%	42.9%	56.7%
	Arlington	71.8%	42.3%	46.5%	57.1%
	Fairfax - Inclusive	76.2%	41.7%	42.2%	58.5%
	Prince William - Inclusive	69.9%	42.9%	41.3%	60.0%
	Leesburg/Loudon	65.9%	44.0%	40.7%	59.3%
Ethnicity	Hispanic/Latino	71.6%	43.4%	42.1%	57.2%
	Not Hispanic/Latino	79.7%	36.5%	44.4%	67.6%
Years of Residence	Less than 1 year	72.2%	43.1%	41.7%	60.6%
	1 to 3 years	73.8%	42.3%	43.3%	59.6%
	4 to 9 years	75.2%	42.9%	46.1%	57.0%
	10 to 19 years	68.8%	48.9%	46.1%	62.2%
	20 or more years	70.3%	36.3%	32.7%	54.0%
Home Ownership	Owned	73.9%	44.0%	44.4%	61.2%
	Rented	73.2%	41.5%	40.2%	54.7%
Household Income	Less than \$35,000	65.8%	41.1%	41.7%	56.9%
	\$35,000 to \$49,999	76.9%	36.9%	39.1%	57.1%
	\$50,000 to \$74,999	78.6%	40.0%	46.5%	58.8%
	\$75,000 to \$99,999	68.0%	46.8%	43.0%	59.8%
	\$100,000 to \$124,999	69.7%	38.8%	34.8%	59.1%
	\$125,000 to \$149,999	77.3%	48.5%	40.0%	56.9%
	\$150,000 to \$174,999	68.4%	47.4%	47.4%	52.6%
	\$175,000 to \$199,999	69.6%	60.9%	56.5%	73.9%
	\$200,000 or greater	73.9%	34.0%	40.0%	57.8%

Figure 34. Participants were provided the following statements with response options being "Yes", "No", or "Does not apply":

- I understand more about the impact of pet waste on water quality.
- I'd like to pick up pet waste more often, though I haven't made any changes yet.
- I now pick up pet waste more often.

• I was already doing what is recommended to reduce water pollution from pet waste.

Of those respondents who had seen the ad prior to completing the current survey, 72.6% report understanding more about pet waste, 42.5% report wanting to pick up pet waste more often despite not having made any changes yet, 42.4% report now picking pet waste up more often and 58.5% report already doing what is recommended.

Demographic	Sub-category	Understands Pet Waste	Want Pet Waste	More Pet Waste	Pet Waste Already
	All Respondents	72.6%	42.5%	42.4%	58.5%
Gender	Male	74.6%	51.1%	51.5%	63.3%
	Female	71.0%	33.6%	32.3%	53.1%
Age	21 to 24	80.4%	59.4%	51.6%	67.7%
	25 to 34	72.4%	43.9%	44.6%	65.7%
	35 to 44	71.0%	49.7%	53.6%	61.5%
	45 to 54	76.4%	38.0%	38.6%	47.9%
	55 to 64	67.9%	17.0%	17.0%	37.7%
	65 to 74	63.9%	13.9%	11.4%	41.7%
	75 or older	50.0%	12.5%	12.5%	50.0%
Locality	Alexandria	74.2%	42.9%	42.9%	56.7%
	Arlington	71.8%	42.3%	46.5%	57.1%
	Fairfax - Inclusive	76.2%	41.7%	42.2%	58.5%
	Prince William - Inclusive	69.9%	42.9%	41.3%	60.0%
	Leesburg/Loudon	65.9%	44.0%	40.7%	59.3%
Ethnicity	Hispanic/Latino	71.6%	43.4%	42.1%	57.2%
	Not Hispanic/Latino	79.7%	36.5%	44.4%	67.6%
Years of Residence	Less than 1 year	72.2%	43.1%	41.7%	60.6%
	1 to 3 years	73.8%	42.3%	43.3%	59.6%
	4 to 9 years	75.2%	42.9%	46.1%	57.0%
	10 to 19 years	68.8%	48.9%	46.1%	62.2%
	20 or more years	70.3%	36.3%	32.7%	54.0%
Home Ownership	Owned	73.9%	44.0%	44.4%	61.2%
	Rented	73.2%	41.5%	40.2%	54.7%

Table 29. Ad impact on pet waste clean-up behavior by demographic group among participants who had seen the advertisement prior to completing the current survey.

Demographic	Sub-category	Understands Pet Waste	Want Pet Waste	More Pet Waste	Pet Waste Already
Household Income	Less than \$35,000	65.8%	41.1%	41.7%	56.9%
	\$35,000 to \$49,999	76.9%	36.9%	39.1%	57.1%
	\$50,000 to \$74,999	78.6%	40.0%	46.5%	58.8%
	\$75,000 to \$99,999	68.0%	46.8%	43.0%	59.8%
	\$100,000 to \$124,999	69.7%	38.8%	34.8%	59.1%
	\$125,000 to \$149,999	77.3%	48.5%	40.0%	56.9%
	\$150,000 to \$174,999	68.4%	47.4%	47.4%	52.6%
	\$175,000 to \$199,999	69.6%	60.9%	56.5%	73.9%
	\$200,000 or greater	73.9%	34.0%	40.0%	57.8%

Figure 34. Ad impact on pet waste behaviors.



Percent Agreement

Figure 35. Ad impact across years.

Year of Survey								
Survey Questions Response	2016	2017	2018	2019	2020	2021	2022	2023
Picks up pet waste more often	17.9%	18.6%	24.3%	32.5%	48.2%	46.2%	41.7%	42.4%
Plans to fertilize less often	14.1%	14.4%	23.0%	24.7%	34.5%	31.7%	37.4%	50.8%
Properly disposes of motor oil	7.7%	5.9%	12.2%	7.8%	14.5%	18.6%	12.2%	48.2%

* *Red font* indicates that the value significantly differs from the current 2023 value.





2.5.4.2 Impact of advertisements on lawn/garden fertilization

Next, respondents were asked about their fertilizer behaviors. Participants were provided with the following statements with the response options being "Yes", "No", or "Does not apply":

- I understand more about the impact of fertilizer on water quality.
- I'd like to fertilize fewer time during the year.
- I now plan to fertilize fewer times during the year.
- I was already doing what is recommended to reduce water pollution from fertilizer.

Of respondents who reported seeing the ad(s) previously, 73.2% report understanding more about the impact of fertilizer on water quality, 50.3% report wanted to fertilize fewer times

despite not making any changes yet, 50.8% report now fertilizing less frequently and 52.9% report that they were already doing what is recommended as can be seen in Table 30 and Figure 37.

Demographic	Sub-category	Understand Fertilizer	Want Fertilizer	Less Fertilizer	Fertilizer Already
	All Respondents	73.2%	50.3%	50.8%	52.9%
Gender	Male	77.5%	57.1%	56.3%	60.5%
	Female	69.3%	42.9%	44.8%	44.2%
Age	21 to 24	76.8%	63.4%	66.0%	57.4%
	25 to 34	72.8%	53.3%	52.7%	47.0%
	35 to 44	76.4%	56.1%	54.1%	61.5%
	45 to 54	74.6%	43.7%	45.1%	52.1%
	55 to 64	58.5%	30.2%	32.1%	36.5%
	65 to 74	71.4%	26.5%	32.4%	52.8%
	75 or older	75.0%	25.0%	25.0%	75.0%
Locality	Alexandria	68.9%	45.6%	47.2%	45.5%
	Arlington	77.1%	48.6%	54.3%	52.9%
	Fairfax - Inclusive	75.2%	53.7%	53.0%	55.5%
	Prince William - Inclusive	72.7%	48.6%	48.2%	51.8%
	Leesburg/Loudon	70.3%	50.5%	49.5%	54.9%
Ethnicity	Hispanic/Latino	73.0%	50.7%	50.9%	53.3%
	Not Hispanic/Latino	75.0%	47.9%	50.0%	50.0%
Years of	Less than 1 year	75.0%	50.0%	45.8%	49.3%
Residence	1 to 3 years	74.1%	44.2%	47.9%	44.8%
	4 to 9 years	69.7%	53.9%	54.6%	55.9%
	10 to 19 years	75.3%	53.9%	59.6%	63.3%
	20 or more years	74.0%	52.0%	45.5%	54.5%
Home Ownership	Owned	76.1%	56.5%	54.8%	59.0%
	Rented	70.4%	43.8%	45.3%	44.0%
Household Income	Less than \$35,000	63.9%	43.7%	42.3%	54.9%
	\$35,000 to \$49.999	71.9%	47.6%	55.6%	49.2%

Table 30. Ad impact on fertilizing behavior by demographic group of those who had seen the advertisement prior to completing the survey.

Demographic	Sub-category	Understand Fertilizer	Want Fertilizer	Less Fertilizer	Fertilizer Already
	\$50,000 to \$74,999	74.8%	53.5%	48.7%	53.0%
	\$75,000 to \$99,999	71.4%	61.5%	65.9%	62.0%
	\$100,000 to \$124,999	63.6%	28.8%	30.3%	24.6%
	\$125,000 to \$149,999	81.5%	61.5%	60.0%	58.5%
	\$150,000 to \$174,999	73.7%	55.3%	52.6%	39.5%
	\$175,000 to \$199,999	87.0%	47.8%	43.5%	65.2%
	\$200,000 or greater	84.4%	46.7%	51.1%	73.3%

Figure 37. Ad impact on fertilization behaviors.



2.5.4.3 Impact of advertisements on motor oil disposal

Finally, these survey participants were asked about their behaviors regarding disposing of motor oil after watching the advertisements. Respondents were provided the following statements with the option to respond "Yes", "No", or "Does not apply":

- I understand more about the impact of motor oil on water quality.
- I'd like to dispose of motor oil properly, though I haven't made any changes yet.
- I now properly dispose of motor oil.
- I was already doing what is recommended to reduce water pollution from motor oil.

Of the respondents, 73.8% report understanding more about the impact of motor oil on water quality, 43.7% report wanting to dispose of motor oil properly despite not making any changes yet, 48.2% report now properly disposing of motor oil and 68.8% of respondents were already doing what is recommended as shown in Table 31 and Figure 38.

Demographic	Sub-category	MO Understand	MO Want	MO Now	MO Already
	All Respondents	73.8%	43.7%	48.2%	68.8%
Gender	Male	76.5%	51.3%	56.7%	73.1%
	Female	71.3%	34.7%	38.7%	64.3%
Age	21 to 24	73.4%	67.0%	51.6%	68.1%
	25 to 34	73.8%	47.9%	48.2%	64.5%
	35 to 44	77.0%	48.0%	53.7%	68.7%
	45 to 54	76.1%	29.6%	46.5%	80.0%
	55 to 64	66.0%	15.1%	26.9%	62.3%
	65 to 74	71.4%	17.6%	44.1%	72.2%
	75 or older	62.5%	25.0%	75.0%	100.0%
Locality	Alexandria	76.4%	46.1%	51.7%	69.7%
	Arlington	77.1%	47.1%	53.6%	71.4%
	Fairfax - Inclusive	74.8%	44.2%	47.7%	67.7%
	Prince William - Inclusive	71.8%	41.8%	46.4%	70.0%
	Leesburg/Loudon	68.9%	39.6%	44.0%	67.0%
Ethnicity	Hispanic/Latino	73.9%	44.8%	49.1%	68.9%
	Not Hispanic/Latino	73.6%	36.1%	41.7%	68.1%
Years of Residence	Less than 1 year	70.8%	38.9%	38.9%	70.8%
	1 to 3 years	74.4%	49.7%	47.9%	69.5%
	4 to 9 years	73.0%	44.1%	52.0%	65.8%
	10 to 19 years	76.4%	42.7%	49.4%	67.8%
	20 or more years	74.0%	37.4%	48.5%	71.7%

Table 31. Ad impact on motor oil (MO) disposal by demographic group among respondents who had seen the advertisement prior to completing the survey.

Demographic	Sub-category	MO Understand	MO Want	MO Now	MO Already
Home	Owned	76.0%	43.1%	50.8%	70.1%
Ownership	Rented	72.0%	45.3%	44.6%	67.5%
Household Income	Less than \$35,000	70.4%	39.4%	42.3%	73.2%
	\$35,000 to \$49,999	71.9%	39.7%	41.9%	59.4%
	\$50,000 to \$74,999	74.8%	48.7%	53.9%	73.9%
	\$75,000 to \$99,999	72.5%	45.1%	51.6%	71.4%
	\$100,000 to \$124,999	70.8%	37.9%	39.4%	60.6%
	\$125,000 to \$149,999	76.9%	50.8%	51.6%	73.8%
	\$150,000 to \$174,999	73.7%	47.4%	44.7%	52.6%
	\$175,000 to \$199,999	87.0%	39.1%	43.5%	65.2%
	\$200,000 or greater	75.6%	37.8%	57.8%	77.3%
Figure 38. Ad impact on motor oil behaviors.



2.5.5 Perceptions of the Campaign Sponsor (NVCWP)

Survey participants were asked about their perceptions of the campaign sponsor, the Northern Virginia Clean Water Partners, as perceptions of the campaign sponsor are known to impact consumer perceptions of the campaign. Table 32 and Figure 39 shows the percentage of respondents that indicate that they "Agree" or "Strongly Agree" with statements about NVCWP, on a 5-point scale of "Strongly Disagree", "Disagree", "Neither agree nor Disagree", "Agree" and "Strongly Agree". The statements were:

- I was familiar with the NVCWP before this survey
- I trust information from the NVCWP
- I would contact the NVCWP if I had a question or concern about water quality
- The NVCWP shares my values when it comes to water quality

An unusual proportion of respondents did not answer this series of questions. It may be likely that those who skipped the series of questions are not familiar with NVCWP but it cannot be determined from the current data.

Of those who did respond, 42.2% indicate they are familiar with NVCWP. In addition, 73.5% of participants reported they trust information from NVCWP. Respondents in higher household incomes exhibit greater prevalence of trust, with almost 90% of those with a household income greater than \$200,000 voicing trust in the organization. Next, 74.5% of participants reported

believing that they share values about water quality with NVCWP. Finally, 70.9% of respondents stated that they would contact NVCWP if they had questions about water with consistent results across subgroup demographics.

Demographic	Sub-category	Familiar with NCVWP	Trust NCVWP	Share Values with NCVWP	Would Contact NCVWP
		Agree or Strongly Agree	Agree or Strongly Agree	Agree or Strongly Agree	Agree or Strongly Agree
	All Respondents	42.2%	73.5%	74.5%	70.9%
Gender	Male	50.0%	75.9%	75.8%	73.9%
	Female	34.2%	71.2%	73.1%	68.2%
Age	21 to 24	33.3%	68.9%	68.9%	57.3%
	25 to 34	38.7%	72.2%	74.7%	72.8%
	35 to 44	53.5%	76.0%	78.8%	75.3%
	45 to 54	49.3%	79.7%	72.5%	72.5%
	55 to 64	31.4%	63.3%	66.0%	62.0%
	65 to 74	35.1%	80.6%	80.6%	83.3%
	75 or older	37.5%	87.5%	100.0%	87.5%
Locality	Alexandria	41.5%	65.2%	71.1%	67.4%
	Arlington	39.4%	77.3%	79.1%	83.8%
	Fairfax - Inclusive	42.8%	76.9%	75.5%	70.3%
	Prince William - Inclusive	40.9%	71.8%	70.9%	71.3%
	Leesburg/Loudon	45.1%	73.3%	76.7%	65.6%
Ethnicity	Hispanic/Latino	32.9%	70.3%	68.9%	68.5%
	Not Hispanic/Latino	43.5%	74.0%	75.4%	71.3%
Years of Residence	Less than 1 year	34.2%	68.6%	71.4%	65.7%
	1 to 3 years	33.9%	71.4%	74.7%	70.8%
	4 to 9 years	48.7%	74.1%	74.0%	75.9%
	10 to 19 years	50.5%	74.7%	72.8%	63.0%
	20 or more years	43.6%	78.6%	78.8%	74.7%
Home Ownership	Owned	48.7%	77.2%	78.0%	73.1%
	Rented	33.8%	69.6%	69.6%	69.1%
Household Income	Less than \$35,000	35.2%	60.6%	60.6%	55.4%

Table 32. Perceptions of the campaign sponsor, NVCWP, by demographic group.

Demographic	Sub-category	Familiar with NCVWP	Trust NCVWP	Share Values with NCVWP	Would Contact NCVWP
		Agree or	Agree or	Agree or	Agree or
		Strongly	Strongly	Strongly	Strongly
		Agree	Agree	Agree	Agree
	\$35,000 to \$49,999	51.6%	67.8%	78.0%	73.3%
	\$50,000 to \$74,999	34.7%	77.6%	76.7%	73.0%
	\$75,000 to \$99,999	38.8%	72.5%	72.5%	72.5%
	\$100,000 to \$124,999	29.9%	71.4%	75.4%	72.3%
	\$125,000 to \$149,999	54.5%	78.5%	76.9%	76.6%
	\$150,000 to \$174,999	50.0%	64.9%	67.6%	67.6%
	\$175,000 to \$199,999	65.2%	82.6%	82.6%	69.6%
	\$200,000 or greater	47.9%	89.4%	85.1%	74.5%

* *Red font* indicates significant differences within a demographic subgroup.





2.6 Message Sources

Survey participants were asked about their TV service provider and which channels they watch in order to get a better understanding of their sources of messaging. Provided options for TV service provider were "Verizon", "Comcast", "Cox", "Xfinity", "Do not have cable TV", "Do not watch TV", "I don't know", and the option to write-in another provider not listed. As shown in Table 33 and Figure 40, 38.6% of participants report using Verizon as their TV service provider, 10.2% report using Cox, 19.6% report using Xfinity and 6.5% report using Comcast. Additionally, 18.6% report not having cable, 2.5% report not watching TV, 2.2% report using some other service not listed, and 1.8% of respondents report not knowing which TV service provider they use. Verizon appears to be the most popular TV service provider among participants in Fairfax, Prince William, Leesburg/Loudon Counties, those who own their homes, those who have longer tenures in their home, and those with higher household incomes.

Demographic	Sub-category			т	V Service I	Provider			
		Verizon	Comcast	Сох	Xfinity	No Cable TV	Don't Watch TV	l dont know	Other
	All Respondents	38.6%	6.5%	10.2%	19.6%	18.6%	2.5%	1.8%	2.2%
Gender	Male	41.2%	6.5%	10.4%	21.4%	13.3%	3.6%	1.6%	1.9%
	Female	35.6%	6.4%	10.0%	17.8%	24.6%	1.1%	2.1%	2.5%
Age	21 to 24	42.9%	4.1%	13.3%	22.4%	10.2%	1.0%	3.1%	3.1%
	25 to 34	34.1%	9.8%	8.1%	22.0%	19.1%	3.5%	2.3%	1.2%
	35 to 44	36.1%	6.5%	9.0%	22.6%	18.1%	3.2%	1.9%	2.6%
	45 to 54	46.6%	6.8%	9.6%	13.7%	21.9%	0.0%	0.0%	1.4%
	55 to 64	35.8%	0.0%	13.2%	13.2%	32.1%	0.0%	1.9%	3.8%
	65 to 74	39.5%	7.9%	10.5%	13.2%	18.4%	7.9%	0.0%	2.6%
	75 or older	75.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Locality	Alexandria	25.5%	7.4%	10.6%	31.9%	17.0%	3.2%	2.1%	2.1%
	Arlington	23.6%	12.5%	5.6%	25.0%	23.6%	5.6%	2.8%	1.4%
	Fairfax - Inclusive	43.4%	4.0%	18.6%	11.5%	16.8%	1.8%	1.3%	2.7%
	Prince William - Inclusive	45.2%	4.3%	3.5%	23.5%	20.9%	0.9%	0.9%	0.9%
	Leesburg/Loudon	44.0%	9.9%	1.1%	17.6%	17.6%	3.3%	3.3%	3.3%
Ethnicity	Hispanic/Latino	45.5%	5.2%	6.5%	15.6%	22.1%	2.6%	1.3%	1.3%
	Not Hispanic/Latino	37.6%	6.7%	10.7%	20.2%	18.0%	2.5%	1.9%	2.3%
Years of	Less than 1 year	17.6%	5.4%	13.5%	24.3%	24.3%	4.1%	6.8%	4.1%
Residence	1 to 3 years	33.5%	9.4%	7.1%	17.6%	26.5%	3.5%	1.2%	1.2%
	4 to 9 years	46.5%	5.1%	10.2%	20.4%	12.1%	1.3%	2.5%	1.9%
	10 to 19 years	42.1%	5.3%	11.6%	22.1%	16.8%	0.0%	0.0%	2.1%
	20 or more years	47.1%	5.9%	11.8%	15.7%	12.7%	3.9%	0.0%	2.9%
	Owned	48.4%	6.4%	8.4%	15.9%	13.9%	2.0%	1.4%	3.5%

Table 33. TV service providers among respondents by demographic group.

Demographic	Sub-category	TV Service Provider								
		Verizon	Comcast	Сох	Xfinity	No Cable TV	Don't Watch TV	l dont know	Other	
Home Ownership	Rented	24.9%	5.9%	11.4%	25.7%	26.2%	3.0%	2.5%	0.4%	
Household Income	Less than \$35,000	20.5%	6.8%	5.5%	24.7%	26.0%	8.2%	6.8%	1.4%	
	\$35,000 to \$49,999	33.8%	9.2%	12.3%	24.6%	15.4%	1.5%	3.1%	0.0%	
	\$50,000 to \$74,999	31.9%	9.2%	11.8%	19.3%	20.2%	3.4%	0.8%	3.4%	
	\$75,000 to \$99,999	40.0%	3.0%	15.0%	23.0%	14.0%	0.0%	3.0%	2.0%	
	\$100,000 to \$124,999	40.3%	9.0%	9.0%	13.4%	22.4%	3.0%	0.0%	3.0%	
	\$125,000 to \$149,999	47.7%	3.1%	6.2%	23.1%	15.4%	1.5%	0.0%	3.1%	
	\$150,000 to \$174,999	55.3%	7.9%	7.9%	10.5%	18.4%	0.0%	0.0%	0.0%	
	\$175,000 to \$199,999	56.5%	4.3%	8.7%	21.7%	8.7%	0.0%	0.0%	0.0%	
	\$200,000 or greater	50.0%	4.2%	10.4%	8.3%	20.8%	2.1%	0.0%	4.2%	

* *Red font* indicates significant differences within a demographic subgroup.





TV channel options provided in the survey were "HLN TV", "Oxygen", "Toon", "ENT", "Animal Planet", "CNN", "ESPN", "History", "National Geographic", "Home and Garden", and "None of the above". When asked which TV channels they watched (see Table 34 and Figure 41), 42.9% of participants reported watching ESPN, 42.6% watch CNN, 34.1% watch History, 40.1% watch National Geographic, 26.0% watch Home and Garden, 28.0% watch Animal Planet, 9.2% watch HLN, 12.4% Toon, 16.4% watch Oxygen and 7.7% watch ENT. Finally, 19.5% of respondents report that they do not watch any of the listed channels. Among male participants, ESPN (57.0%) and CNN (50.1%) were reported as the most watched TV channels.

Demographic	Sub-category					TV C	Channels	Watched				
		HLN	ENT	ESPN	HGTV	Oxygen	Toon	Animal Planet	History	National Geographi c	CNN	None of the Chan nels Listed
	All Respondents	9.2%	7.7%	42.9%	26.0%	16.4%	12.4%	28.0%	34.1%	40.1%	42.6%	19.5%
Gender	Male	12.0%	11.3%	57.0%	23.0%	17.5%	16.5%	26.2%	38.8%	40.8%	47.6%	13.3%
	Female	6.4%	3.9%	27.4%	29.2%	15.7%	8.2%	29.9%	29.5%	39.9%	37.7%	26.7%
Age	21 to 24	7.1%	6.1%	47.5%	15.2%	11.1%	14.1%	27.3%	21.2%	29.3%	30.3%	20.2%
	25 to 34	9.2%	8.1%	39.9%	26.0%	20.2%	17.3%	31.8%	32.9%	43.4%	41.0%	17.9%
	35 to 44	11.0%	13.5%	49.0%	27.1%	22.6%	11.6%	26.5%	34.8%	40.0%	49.0%	18.1%
	45 to 54	12.3%	6.8%	47.9%	28.8%	13.7%	11.0%	31.5%	41.1%	39.7%	50.7%	19.2%
	55 to 64	3.8%	0.0%	32.1%	39.6%	5.7%	5.7%	24.5%	43.4%	49.1%	43.4%	22.6%
	65 to 74	5.3%	0.0%	28.9%	26.3%	2.6%	2.6%	18.4%	36.8%	39.5%	39.5%	26.3%
	75 or older	25.0%	0.0%	25.0%	25.0%	37.5%	0.0%	25.0%	62.5%	50.0%	37.5%	25.0%
Locality	Alexandria	12.8%	6.4%	41.5%	24.5%	18.1%	11.7%	22.3%	27.7%	37.2%	44.7%	22.3%
	Arlington	6.9%	2.8%	33.3%	25.0%	13.9%	6.9%	26.4%	31.9%	31.9%	43.1%	22.2%
	Fairfax - Inclusive	11.1%	9.3%	47.8%	26.5%	16.4%	11.1%	29.2%	35.8%	38.9%	46.5%	16.4%
	Prince William - Inclusive	7.0%	7.0%	43.5%	27.0%	16.5%	17.4%	33.9%	35.7%	50.4%	42.6%	15.7%
	Leesburg/Lou don	5.4%	9.8%	39.1%	26.1%	16.3%	14.1%	25.0%	35.9%	39.1%	30.4%	27.2%
Ethnicity	Hispanic/Lati no	5.2%	5.2%	39.0%	19.5%	13.0%	10.4%	28.6%	27.3%	29.9%	40.3%	20.8%
	Not Hispanic/Lati no	9.8%	8.0%	43.5%	27.0%	16.9%	12.6%	28.0%	35.1%	41.6%	42.9%	19.3%
Years of Residence	Less than 1 year	6.8%	4.1%	32.4%	16.2%	8.1%	5.4%	25.7%	31.1%	35.1%	39.2%	28.4%
	1 to 3 years	7.6%	4.1%	44.1%	23.5%	17.1%	8.8%	30.6%	29.4%	40.6%	44.1%	21.2%
	4 to 9 years	9.6%	8.9%	47.8%	27.4%	15.3%	15.9%	22.9%	33.8%	42.7%	44.6%	14.6%
	10 to 19 years	9.4%	12.5%	38.5%	25.0%	19.8%	13.5%	29.2%	34.4%	35.4%	37.5%	21.9%
	20 or more years	12.7%	9.8%	45.1%	36.3%	19.6%	16.7%	32.4%	44.1%	43.1%	44.1%	15.7%
Home	Owned	9.8%	8.7%	48.6%	30.3%	16.8%	13.3%	28.6%	35.5%	40.5%	43.6%	15.9%
Ownership	Rented	8.0%	5.5%	36.3%	19.8%	15.2%	11.0%	27.4%	31.2%	40.1%	42.2%	24.9%
Household Income	Less than \$35,000	8.2%	6.8%	28.8%	19.2%	15.1%	17.8%	21.9%	30.1%	28.8%	31.5%	32.9%
	\$35,000 to \$49,999	3.1%	3.1%	23.1%	15.4%	16.9%	12.3%	29.2%	29.2%	29.2%	38.5%	30.8%

Table 34. TV channels that respondents report watching by demographic group.

Demographic	Sub-category		TV Channels Watched											
		HLN	ENT	ESPN	HGTV	Oxygen	Toon	Animal Planet	History	National Geographi C	CNN	None of the Chan nels Listed		
	\$50,000 to \$74,999	7.6%	7.6%	42.9%	20.2%	13.4%	10.9%	31.1%	31.1%	42.0%	42.0%	18.5%		
	\$75,000 to \$99,999	12.0%	8.0%	41.0%	37.0%	21.0%	14.0%	28.0%	32.0%	44.0%	48.0%	15.0%		
	\$100,000 to \$124,999	10.4%	1.5%	53.7%	26.9%	16.4%	10.4%	25.4%	37.3%	47.8%	43.3%	23.9%		
	\$125,000 to \$149,999	6.1%	7.6%	57.6%	30.3%	13.6%	9.1%	27.3%	37.9%	37.9%	59.1%	10.6%		
	\$150,000 to \$174,999	10.5%	10.5%	39.5%	26.3%	15.8%	13.2%	28.9%	42.1%	39.5%	26.3%	13.2%		
	\$175,000 to \$199,999	17.4%	26.1%	69.6%	21.7%	30.4%	13.0%	26.1%	34.8%	43.5%	26.1%	4.3%		
	\$200,000 or greater	14.6%	12.5%	50.0%	37.5%	12.5%	10.4%	33.3%	41.7%	50.0%	52.1%	14.6%		

* *Red font* indicates significant differences within a demographic subgroup.

Figure 41. TV channels watched.



3 APPENDIX

3.1 Survey Instrument

2023 Stormwater Survey

Survey Instrument

Programming instructions

- Programming instructions are in [SQUARE BRACKETS].
- Skip/branch logic is in [RED SQUARE BRACKETS].
- All items are single-select unless otherwise noted.
- Retain response option order unless noted.
- Retain grid item order unless noted.
- Allow respondents to go back/forward.
- Respondents may skip any question, but give one prompt if they move forward without a response. Terminate if a screener question is skipped.

Consent and screening

We're conducting this survey to understand opinions related to storm water. Everything you say will be anonymous. You'll watch a couple short videos, so please make sure your sound is on. The survey should take about 10 minutes.

Do you want to proceed? Yes No [END SURVEY]

Section	Construct	Q #	Question
Demograp hics	Sex	S1	First, we'll ask a few questions about you. What is your gender identity?
			Male Female
			Non-binary/non-conforming Prefer not to answer
Demograp hics	Age	S2	Which of the following categories includes your age?
			Under 18 [END SURVEY]
			18 to 20 [END SURVEY]
			21 to 24
			25 to 34
			35 to 44
			45 to 54
			65 to 74
			75 or older
Demograp hics	Residence Type	S3	Is your home?
	71		Owned
			Rented
			Military housing
			Transitional housing
			Other (Please specify):
Demograp hics	VA Residency	S4	Do you live in the state of Virginia?
			Yes
			No [END SURVEY]

Demograp	NoVA	S5	Do you live in one of the following towns, cities, or counties? Please
hics	Residency		select only one location.
			Alexandria
			Arlington
			Fairfax County: Fairfax City
			Fairfax County: Herndon
			Fairfax County: Vienna
			Fairfax County, but not one of the cities/towns listed
			Falls Church
			Henrico County [END SURVEY]
			Loudoun County: Leesburg
			Loudoun County, but not Leesburg
			Prince William County: Dumfries
			Prince William County: Manassas
			Prince William County: Manassas
			Prince William County, but not one of the cities/towns listed
			Prince William County, but not one of the cities/towns listed
			Nicrinia Baseh [END SURVEY]
			Virginia Beach [END SORVET]
			None of the above [END SORVEY]
Demograp	HH Income	56	What is your household's annual income?
hics	TITINCOME	50	
11105			Loss than \$25,000
			62E 000 to \$40,000
			\$55,000 to \$49,999
			\$50,000 to \$74,999
			\$75,000 to \$99,999
			\$100,000 to \$124,999
			\$125,000 to \$149,999
			\$150,000 to \$174,999
			\$175,000 to \$199,999
			\$200,000 or greater
Damagnan	Ethericity -	67	Mikish of the following describes us on otherisity 2 (Discussed at all the t
Demograp	Ethnicity	57	which of the following describes your ethnicity? (Please select all that
mes			арріу)
			African American (Deals
			American Indian (Native Aleskan
			American Indian/Native Alaskan
			Hispanic/Latino
			Native Hawaiian/Pacific Islander
			white/Caucasian
			Otner:

Demograp hics	Years in residence	Q1	How many years have you lived in your current residence? Less than 1 year 1 to 3 years 4 to 9 years 10 to 19 years 20 or more years
Behavior	Lawn or garden at residence	Q2	Does your home have a lawn or garden, no matter how small? Yes No
Behavior	Lawn care familiarity	Q3	[IF Q2 = YES] Are you familiar with how your garden or lawn is cared for (e.g., fertilizer use, mowing)? Yes No
Behavior	Lawn care use	Q4	[IF Q2 = YES] Do you use a lawn care service at least once a year? Yes No
Behavior	Vehicle owner	Q5	Do you own or lease a personal vehicle? Yes No
Demograp hics	Own a dog	Q6	Is there one or more dogs in your home that you are at least partially responsible for? Yes No
Knowledge	Watershed	Q7	Are you familiar with the term "watershed"? Yes No [DISPLAY TEXT ON NEXT PAGE <u>AFTER</u> RESPONSE HAS BEEN ENTERED.] A watershed is an area of land that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean.

Demograp	Reside within	Q8	
hics	watershed		Do you live in the
			YES NO Don't Know
			Chesapeake Bay watershed?
			Potomac River watershed?
			Another watershed not listed?
Perceptions	Storm water	Q9	"Stormwater" is rainwater that flows into the street, along the gutter and
	final		into the storm drain. To the best of your knowledge, does storm water
	destination		eventually end up in?
			YES NO Don't Know
			A wastewater treatment facility?
			Potomac River or Chesapeake Bay?
			A nearby stream or creek
			Other:
Behavior	Dog walk	Q10	[IF Q6= YES]
	cleanup		When taking your dog(s) for a walk, how often do you pick up after your
	frequency		dog(s)?
			Always
			Usually
			Sometimes
			Rarely
			Never
			Not applicable/I don't take the dog(s) on walks
Behavior	Dog yard	Q11	[IF Q6 = YES AND Q2 = YES]
	clean up		How often do you (or someone else from your household) remove your
	frequency		dog's waste from your yard?
			Not applicable – dog not allowed to go in the home's yard
			Daily
			Weekly
			Monthly
			Less often than once a month
			Never
			Not sure

Belief	Reason for dog clean up	Q12	[IF Q10 = (Always, Usually, Sometimes, Rarely) AND Q11 = (Daily, Weekly, Monthly, Less often than once a month)] What is the most important reason to pick up after your dog(s)? (Please select only one) City/county ordinance Don't want to step in it It causes water pollution It is gross It's what good neighbors do Odor Other reason None/no reason to
Behavior	Grass clippings handling	Q13	[IF Q3 = YES] How are your grass clippings disposed of? Bagged and put in the regular trash Bagged and put in compost/recycling bags for pick up Left on the lawn/garden Put in a compost pile/bin Not sure Other Not applicable/don't have grass clippings
Behavior	Grass clippings on street handling	Q14	[IF Q3 = YES] After your grass has been mown, what is done if grass clippings end up in the street? They are left there. They are swept or blown back into the lawn. They are swept or blown into the storm drain Not applicable/don't have grass clippings Other: Not sure
Behavior	Lawn fertilization frequency	Q15	[IF Q3 = YES] Which of the following best describes how often your lawn is fertilized? 1 time a year 2 times a year 3 times a year 4+ times a year Only if/when if a soil test indicates the grass needs fertilizer Never Not sure

Knowledge	Rain barrel familiarity	Q16	A rain barrel is a barrel you put under your downspout to collect rain water that you can use around your yard. Which of the following statements are true for you?						
				YES	NO				
			I have a rain barrel.						
			I am familiar with rain barrels.						
			I don't have a rain barrel but I'm interested in						
			getting one.						
Knowledge	Rain garden familiarity	Q17	A rain garden is a bowl-shaped garden area wher soak into the ground. Which of the following state	e runo ements	ff can co s are tru	ollect and e for you?			
				YES	NO				
			I have a rain garden.						
			I am familiar with rain gardens.						
			I don't have a rain garden but I'm interested in installing one.						
	landscaping familiarity		yard with native plants. Which of the following str you?	ateme	nts are t	rue for			
			I have conservation landscaping in my yard.						
			I am familiar with conservation landscaping.						
			I don't have conservation landscaping but I'm interested in installing it.						
Behavior	Vehicle oil handling	Q19	[IF Q5 = YES] When you need to change the oil in your car or tr with the old motor oil? I don't change the oil myself/I take it to a ga Take the old motor oil to a gas station or haz Store it in my garage Put it in the trash Dump it in the gutter or down the storm sew Dump it down the sink Dump it on the ground Other:	uck, w rage/o mat fa ver	hat do y il change cility for	ou do e service recycling			

Knowledge	HHW drop off knowledge	Q20	Do you know whether or not your locality has a specific place for residents to drop off household hazardous waste (HHW)? HHW includes items like automobile fluids, pesticides and herbicides, oil-based paint and paint thinners, etc. Yes, I know whether we have a location for drop-offs. No, I'm not sure whether we have a location for drop-offs.
Knowledge	Pollution reporting knowledge	Q21	Do you feel that you know who to contact to report potential water pollution? I definitely know I think I know I don't think I know I definitely don't know
Behavior	Likelihood to report pollution	Q22	What is the likelihood that you would call county or town officials to report potential pollution so they could investigate the cause? I definitely would I probably would I'm equally likely to call and to not call I probably would NOT I definitely would NOT
Behavior	Reason for not reporting pollution	Q23	[IF Q26 = Equally likely, Probably not or Definitely not] What is the primary reason that you would not call county or town officials to report potential pollution? I'm too busy It's not my responsibility It's none of my business I prefer not to communicate with officials or authorities Other:
Behavior	Wash vehicle at home	Q24	[IF Q5 = YES] In the past year, where have you washed your personal vehicle? Check all that apply. [MULTISELECT] At my home or someone else's home At a commercial car wash I haven't washed my vehicle Other: [please specify]

Behavior	Wash vehicle	Q25	[IF Q24 = At my/someone else's home]				
	at home		How often do you typically wash your car/truck at home?				
	frequency						
	. ,		Less than once a year				
			1- 2 times per vear				
			3-4 times per year				
			5-6 times per year				
			7-12 times per year				
			12+ times per year				
Robavior	Wash vohielo	0.26	$\left[\int O(2) d = A + home \right]$				
Bellaviol	wash vehicle	Q20	[II Q24 – At nome]	which o	f tha fa	llouing on	
	method		when you wash your car/truck at nome,	which o	i the io	nowing ap	piyr
						NOT	7
				YES	NO	SURE	
			I wash it on the grass, gravel or dirt				
							_
			I use environmentally friendly				
			detergent				_
			I use water only (no soap or				
			detergent)				
Knowledge	Pollution	Q27	Looking at the picture below, would you	conside	r either	to be a po	tential
	identification		source of water pollution?				
			[MEDIA: SurveyImage_POLLUTION.png]				
			Yes				
			No				
			Not sure				
			Cannot see image				
			_				
Sources	TV service	Q28	What TV service provider do you use? [R	ANDOM	IZE FIRS	ST FOUR	
	provider		OPTIONS]				
			Verizon				
			Comcast				
			Cox				
			Xfinity				
			Do not have cable TV				
			Do not watch TV				
			Other:				
			L don't know				
1	1	1					

Sources	TV channels	Q29	Which of the following channels, if any, do you watch? [RANDOMIZE]
			HLN TV Oxygen Toon ENT Animal Planet CNN ESPN History National Geographic Home and Garden None of the above
Knowledge	Clean up activity awareness in past 12 months	Q30	Thinking about the last 12 months, have you <i>heard about</i> any opportunities to participate in a water quality activity, such as a stream clean up, helping to install storm drain labels, etc.? Yes No Not sure
Behavior	Cleanup activity participation in the past 12 months	Q31	[IF Q30 = YES] Thinking about the last 12 months, have you <i>participated in</i> a water quality activity, such as a stream clean up, helping to install storm drain labels, etc.? Yes No
Instruction			Please watch the video below, then we'll ask you a couple questions about it. [VIDEO ORDER RANDOMIZED: "Only Rain Down the Drain!", "Cleaner Streets Means Cleaner Water"]
Awareness	Ad familiarity	Q32	Before this survey, had you seen this ad, or a similar one on TV, Facebook, or Twitter? Yes No Not sure Video did not play

Perception	Ad	Q33	[IF Q32 NOT 'Video did not play"]						
	perceptions		Thinking of the ad video you just saw, indicate whether you agree or						
			disagree with the followi	ng statem	ients abou	ut it.			
				Stro ngly Disa gree	Disa gree	Neit her disag ree or agre e	Agr ee	Stro ngly Agr ee	
			I understand the						
			information in the ad.						
			The ad is relevant to me.						
			I trust the information in the ad.						
			The ad's message is important.						
			The ad is persuasive.						
			I think the ad would be effective.						

Behavior	Ad impact	Q34	[IF Q32 = YES]			
			Thinking back to when you first saw the	e ad(s), pl	ease indi	cate if the
			following statements are true for you n	ow comp	ared to t	hen? (Select all
			that apply.)			·
						DOES NOT
				VES	NO	
			Lunderstand more about the	125	NO	74121
			impact of pet waste on water			
			quality			
			I'd like to nick up net waste more			
			often, though I haven't made any			
			changes vet.			
			Lnow nick up pet waste more			
			often.			
			I was already doing what is			
			recommended to reduce water			
			pollution from pet waste			
				I		
			[PAGE BREAK. KEEP QUESTION AND	RESPON	SE LABE	LS ON SCREEN
						DOES
						NOT
				YES	NO	APPLY
			I understand more about the impact			
			of fertilizer on water quality.			
			I'd <i>like to</i> fertilize fewer times			
			during the year.			
			I now plan to fertilize fewer times			
			during the year.			
			I was already doing what is			
			recommended to reduce water			
			pollution from fertilizer.			
					CEINDE	
			SCREEN.]			
						DOES
						NOT
				YES	NO	APPLY
			I understand more about the impact			
			of motor oil on water quality.			
			I'd like to dispose of motor oil			
			properly, though I haven't made any			
			changes yet.			
			I now properly dispose of motor oil.			
			I was already doing what is			
			recommended to reduce water			
			pollution.			

Instruction			Please watch the video below, then we'll ask you a couple questions about it. [VIDEO ORDER RANDOMIZED: "Only Rain Down the Drain!", "Cleaner Streets Means Cleaner Water"]					
Awareness	Ad familiarity	Q35	Before this survey, had you seen this ad, or a similar one on TV, Facebook, or Twitter? Yes No Not sure Video did not play					
Perception	Ad perceptions	Q36	[IF Q32 NOT 'Video did not play"] Thinking of the ad video you just saw, indicate whether you agree or disagree with the following statements about it.					
				Stro ngly Disa gree	Disa gree	her disag ree or agre e	Agr ee	Stro ngly Agr ee
			I understand the information in the ad.					
			The ad is relevant to me.					
			I trust the information in the ad.					
			The ad's message is important.					
			The ad is persuasive.					
			I think the ad would be effective.					

Behavior	Ad impact	Q37	[IF Q32 = YES]			
			Thinking back to when you first saw the	e ad(s), pl	ease indi	cate if the
			following statements are true for you n	iow comp	ared to t	hen? (Select all
			that apply.)			,
						DOES NOT
				YES	NO	APPLY
			I understand more about the			
			impact of pet waste on water			
			guality.			
			I'd like to pick up pet waste more			
			often, though I haven't made any			
			changes yet.			
			I now pick up pet waste more			
			often.			
			I was already doing what is			
			recommended to reduce water			
			pollution from pet waste			
			[PAGE BREAK KEEP OLIESTION AND	RESPON	SELARE	IS ON SCREEN
						NOT
				VES	NO	
			Lunderstand more about the impact	TLJ	NO	
			of fortilizer on water quality			
			l'd like te fortilize fower times			
			during the year			
			L now plan to fortilize fewer times			
			during the year			
			Lwas already doing what is			
			Twas already doing what is			
			nellution from fortilizor			
			polition from tertilizer.			
			[PAGE BREAK. KEEP QUESTION AND	RESPON	SE LABE	LS ON
			SCREEN.]	1		
						DOES
						NOT
				YES	NO	APPLY
			I understand more about the impact			
			of motor oil on water quality.			
			I'd like to dispose of motor oil			
			properly, though I haven't made any			
			changes yet.			
			I now properly dispose of motor oil.			
			I was already doing what is			
			recommended to reduce water			
			pollution.			

Awareness	Received info about water pollution	Q38	Have you seen or received information about reducing water pollution from any source in the past 12 months? Yes No Not sure
Awareness	Rain logo familiarity	Q39	Have you seen the logo below before? [MEDIA: SHOW SURVEYIMAGE_LOGO] Yes No Cannot see image

Perception	Sponsor	Q40	[DISPLAY TEXT ON SEPAR	ATE PAGE	E.]				
s	awareness		The Northern Virginia Clean Water Partners is a group of local						
	and		governments, drinking water and sanitation authorities, and businesses						
	perceptions		that share the common g	oals to ke	ep North	ern Virgini	a resider	nts healthy	
			and safe by reducing the	amount c	of pollutio	n from sto	rmwater	runoff that	
			reaches local creeks and	rivers, and	d empowe	er individu	als to tak	e action to	
			reduce pollution.						
			[PAGE BREAK.]						
			Indicate whether you agr	ee or disa	agree with	n the follow	ving stat	ements	
			about the Northern Virgin	nia Clean	Water Pa	rtners (NV	CWP).		
						Neit			
				Stro		her		Stro	
				ngly	Disa	disag	Δσr	ngly	
				Disa	gree	ree	- ABI - ABI	Agr	
				gree	8.00	or			
				B. CC		agre			
			I was familiar with the			C			
			NVCWP before this						
			survey.						
			I trust information						
			from the NVCWP.						
			I would contact the						
			NVCWP if I had a						
			question or concern						
			about water quality.						
			The NVCWP shares						
			my values when it						
			comes to water						
			quality.						
								<u>. </u>	

[FINAL PAGE]

Thank you for completing the survey! The survey was sponsored by the Northern Virginia Clean Water Partners. To learn about the Northern Virginia Clean Water Partners, visit onlyrain.org.