City of Tukwila

2012 Assessment of Citizen Understanding and Adoption of Targeted Stormwater Behaviors

September 18, 2012

Prepared By
Jim Hebert, *President*
Terry Thompson, *Research Director*
Tymon Silva, *Research Analyst*

Hebert Research
13629 NE Bel-Red Rd.
Bellevue, WA 98005
www.HebertResearch.com

Point of Contact: Terry Thompson
Office: (425) 643-1337
Fax: (425) 278-0856
tthompson@hebertresearch.com

Table of Contents

Research Goal and Objectives

Research Goal:

The goal of this research was to measure the public's knowledge and practices regarding stormwater in the city of Tukwila. In addition, the research assessed Tukwila businesses' stormwater practices and behaviors. Ultimately, this research may be used for stormwater planning as well as educational outreach to improve the target audience's understanding of the problem and reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts. This is in partial compliance with Phase II municipal stormwater permit requirements in Washington State. Each permittee (City of Tukwila) is required to measure the understanding and adoption of target behaviors of its citizens and property managers/businesses. The research results can be used as a measurement to direct the application of education and outreach resources in the most effective manner.

Furthermore, this research compared the Tukwila stormwater survey findings in 2011 with the results in 2012 to analyze any statistical differences. This longitudinal analysis was used to identify trends and patterns that are occurring among the public's knowledge and practices of stormwater.

Research Objectives:

The following objectives were completed during the course of the research project:

1) Determined the overall public perception of the quality of surface water in Tukwila and compared it with the previous year's ratings.

2) Identified Priority 1, Priority 2, and Priority 3 issues for Tukwila residents. This will help determine what perceptions, behaviors, and practices need the most attention as well as provide direction for an educational outreach program.

3) Identified shifts and trends in Priority 1, Priority 2, and Priority 3 issues that occurred from 2011 to 2012.

4) Determined the public's knowledge of which agency to report an illicit discharge and compared it with the research conducted in 2011.

5) Identified Priority 1, Priority 2, and Priority 3 issues for restaurants, automotive businesses, and property owners/managers.

Research Methodology

Questionnaire

The residential survey was created for administration to the general public within the city of Tukwila. Survey questions were developed by Hebert Research with input from the City. The survey consisted of 30 questions, 27 of them relating directly to knowledge about stormwater issues and practices respondents had adopted, which protect the quality of stormwater. The remaining three questions dealt with an overall assessment of surface water quality, where illicit discharges should be reported, and the age of the respondent. Hebert Research completed all interviews using the same interactive voice (telephone) survey methodology that was utilized in the 2011 assessment of Tukwila.

In addition, a business survey was developed by Hebert Research in collaboration with the City. Survey questions were comprised of stormwater knowledge and behavior in relation to the type of business. For the city of Tukwila, the focus was on three types of businesses, which included:

- Restaurants
- Property Owners/Managers
- Automotives

Sampling Frame

A Random Digit Dialing (RDD) technique was used to field the research. Subjects were selected from a random sample of phone numbers, cross-referenced by ZIP code. The RDD technique ensures proper proportionate sampling. High-density areas have more phone numbers and, by randomly drawing from the list, the high- and low-density areas are properly proportioned. The resulting list was loaded into Hebert Research's CATI (Computer-Aided Telephone Interviewing) system, which randomly selects phone numbers from this list, as required during the interviewing process. Each phone number was called at least five times at different times during the day and evening before being replaced by a new number. This helped to minimize non-response error, meaning that those who were easy to reach and those who were more difficult to contact were equally represented.

Similar to the previous research project, Hebert Research sampled 100 residents of Tukwila, which were weighted back to the 2010 U. S. Census data by age and gender. The following table represents the sample sizes for years 2011 and 2012.

Sample Totals	
Year	**Sample Size**
2011	100
2012	100
Total	200

Research Controls

Hebert Research applied a variety of controls to help ensure that the research and analysis reached the highest quality that can be provided. The primary research controls employed in this study included the following:

Interviewer Training

All interviewers participated in a special training session for this study. During this training session, the questionnaire was read and a discussion was held regarding the objectives of the study, screening questions, skip patterns, and techniques for handling potential problems. Interviewers raised questions and provided their professional feedback regarding potential interviewing issues.

Pre-test the Survey

After the questionnaire was programmed in our CATI system, it was rigorously tested to assure all questions were asked and that data was accurately recorded. Thirty surveys were conducted during the pretest. The programming was deemed to be valid.

Conduct Interviews

Following a successful pretest of the questionnaire, telephone interviews were conducted using Ci3 CATI software from Sawtooth Software, a recognized leader in computer-aided interviewing. Potential respondents were called on weekdays at various times throughout the afternoon and evening until 9:00 pm. An appointment and callback procedure was used when necessary to minimize refusals and allow respondents to complete the survey at a convenient time. Interviews were conducted in English.

Monitoring

Telephone interviews were regularly monitored by the data collection supervisor and were found to be properly conducted.

Internal Peer Review

Hebert Research uses an internal review process called "CERA" (create, edit, review, approve) which is similar to academic peer review to ensure that each study meets or exceeds rigorous quality control standards. Through this process, several analysts review the statistical findings and offer critical feedback designed to increase the utility of the research and produce a clear and insightful report.

Margin of Error, Incidence and Response Rates

A total of 100 surveys were completed by adults living within the zip codes of Tukwila. At the 95% confidence level, the maximum margin of error for a sample size of 100 respondents is ±9.8%. This margin of error means that if the survey was repeated 100 times, the resulting percentages for each response for the city would be within ±9.8% (the margin of error) in 95 out of 100 cases for each question.

Over 1,500 phone numbers of residences in the city were included in the sampling frame. When a resident answered the phone and contact was made, we asked the respondent to participate in the survey. The *incidence rate* represents the percent of individuals we spoke to who were qualified to take the survey, meaning they spoke English and reported living within the city. The *response rate* represents the percent of qualified individuals we spoke to who agreed to participate and who completed an interview. Response rates above 50.0% are higher compared to other community-wide surveys and serve to increase confidence in the survey's validity and reliability. The incidence rate was 19.6% in the 2012 survey; the response rate was 74.2%.

Statistical Weighting

Statistical weighting is a technique that is commonly used in research to reduce sampling error. During the process of data collection, demographic data from the U.S. Census was obtained to identify population parameters for the survey. Sample demographics—specifically, age and gender—were compared with distributions in the population within each city. To compensate for potential sampling bias, weights were calculated and applied to the survey sample for the city in order to ensure that gender and age distributions were represented in the proper proportion according to census statistics. After being weighted by age and gender, the samples for the city were then weighted by population to assure a proper proportionate representation among the city. In the final weighting analysis, it was concluded that the sample was representative of the population for the city within the critical parameters of gender and age according to gender, age and population density.

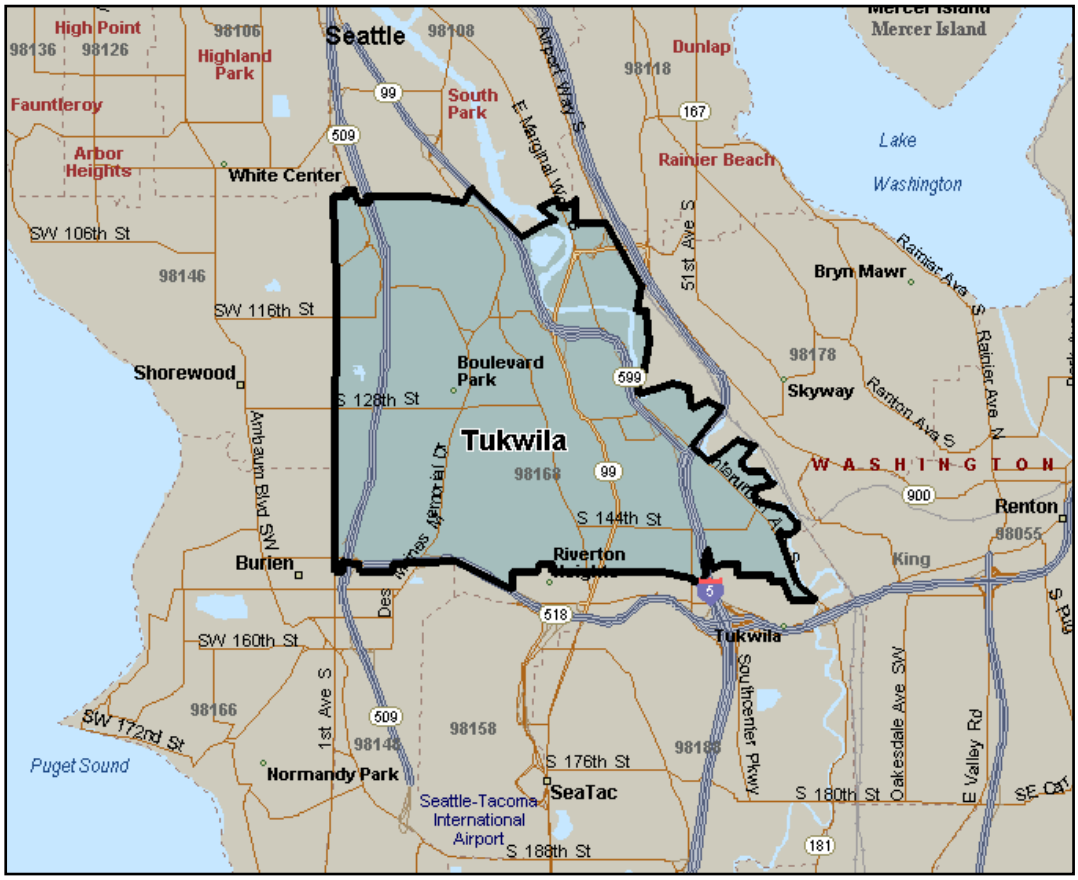
Use of Findings

Hebert Research has made every effort to produce the highest quality research product within the agreed specifications, budget and schedule. The customer understands that Hebert Research uses those statistical techniques, which, in its opinion, are the most accurate possible. However, inherent in any statistical process is a possibility of error, which must be taken into account in evaluating the results. Statistical research can reveal information regarding community perceptions only as of the time of the sampling, within the parameters of the project, and within the margin of error inherent in the techniques used.

Evaluations and interpretations of statistical research findings and decisions based on them are solely the responsibility of the customer and not Hebert Research. The conclusions, summaries and interpretations provided by Hebert Research are based strictly on the analysis of the data gathered, and are not to be construed as recommendations; therefore, Hebert Research neither warrants their viability nor assumes responsibility for the success or failure of any customer actions subsequently taken.

Geographical Map of Surveyed Area

The map below shows the geographic area covered by ZIP code 98168 for the City of Tukwila. Only the Respondents living in the city of Tukwila were asked to take the survey.



Explanation of Multivariate Analysis

The data for the surveys were analyzed using the chi square statistic to examine differences between respondents on a regional basis according to age and gender. Responses for the knowledge questions were first categorized as being either a correct response or an incorrect response. The incorrect response category was made up of wrong answers plus responses classified as "need more information," "don't know/refused," and "not applicable." Following classification, the chi square test was executed. For the questions dealing with the actions of the respondents, those who said the action did not apply to them were eliminated from the data set. Following their removal, the categories were classified as being "correct" or "incorrect" with the "incorrect" classification consisting of the collapsed categories as described above. The statistical test was run using these two categories.

Hypotheses were tested using the 0.05 level of significance as the criterion value for the chi-square analysis. When differences between groups reached this value, the finding is reported along with its level of significance which is stated as a p-value (e.g., $p = 0.04$). Chi-square test results that reach the 0.05 level of significance indicate there is at least a 19-out-of-20 likelihood that the finding is true. This is a generally accepted level of reliability for public surveys. Findings of no significance are also reported to provide the basis for conclusions regarding the uniformity of opinion across the sample.

Cramér's *V* is a statistical test that measures the degree of association between two categorical variables. For statistical tests that reach significance using chi-square, Cramér's *V* values are provided to describe the strength of the association between the variables. This measurement ranges between 0.0 and 1.0. The higher the level of association, the greater is the probability that the independent variable is causing an effect on the dependent variable. A measurement of 0 indicates there is no association between the two, meaning it is likely the independent variable has no systematic effect on the dependent variable. A measurement of 1.0 indicates that variations in the independent variable completely match variations in the dependent variable.

Residential Research Results

Respondent Profile

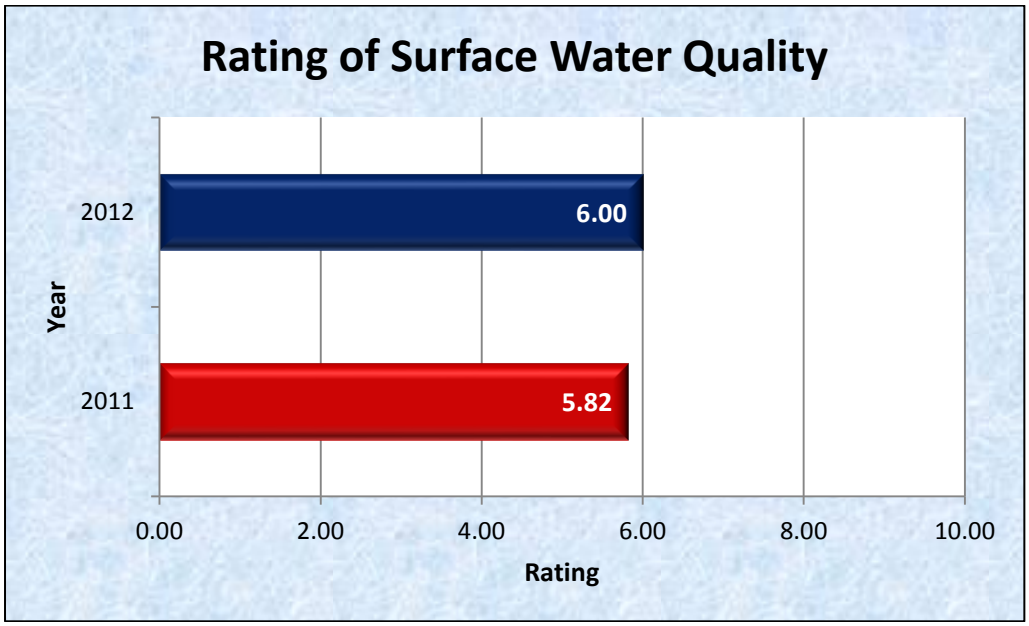
The following tables describe the demographic profile of the sample for Tukwila by age and gender. As indicated in the methodology section, the sample was statistically weighted to match the population by gender and age. The percentages listed below are the weighted sample frequencies for age and gender according to 2010 U.S. Census data. Un-weighted percentages have been included for comparison.

2012 Weighted Sample - Gender		
Gender	**Actual**	**Weighted**
Male	43.0%	52.3%
Female	57.0%	47.7%

2012 Weighted Sample - Age		
Age Group	**Actual**	**Weighted**
18-24	6.0%	13.4%
25-34	7.0%	23.2%
35-44	7.0%	19.8%
45-54	14.0%	19.5%
55-64	29.0%	13.7%
65+	37.0%	10.5%

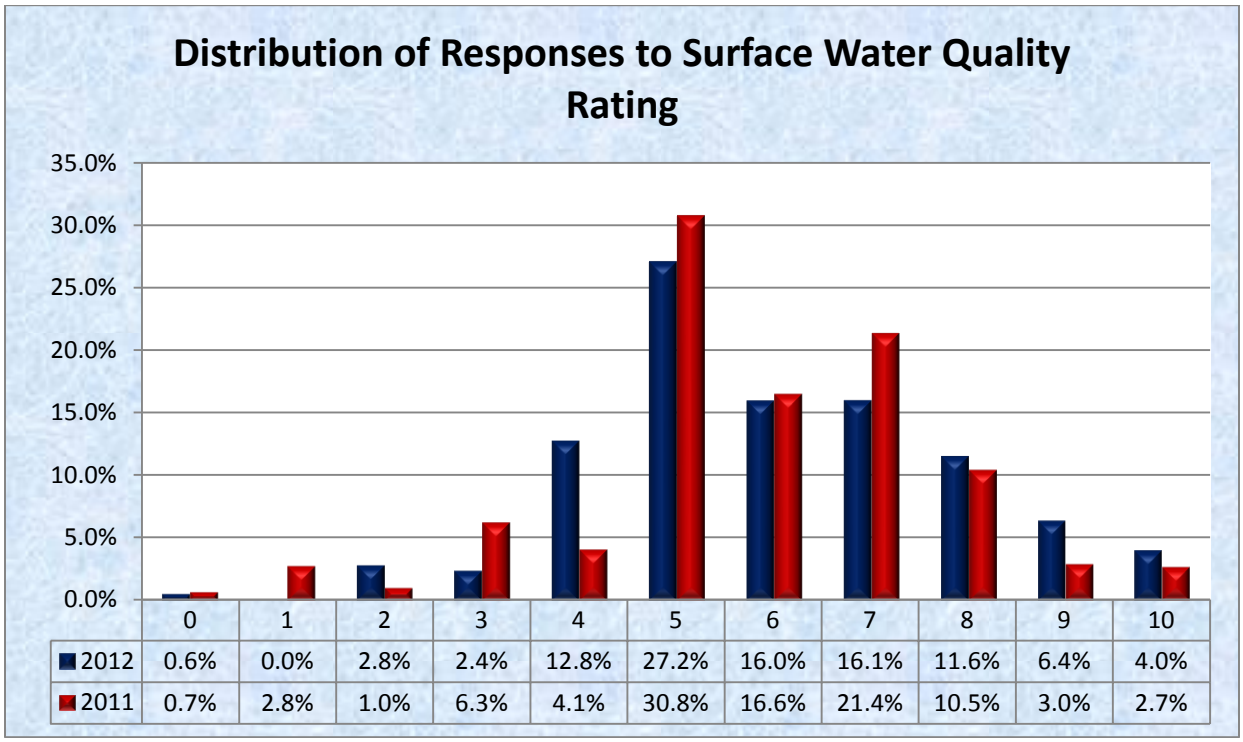
Assessment of Water Quality in the Environment

Respondents rated the quality of water in Tukwila's rivers, wetlands, and lakes on a 0-10 numeric scale where 0 meant "extremely polluted" and 10 meant "extremely clean." The average rating for surface water quality was higher in 2012 than in 2011. The rating increased from 5.82 in 2011 to 6.00 in 2012. This increase was not statistically significant. The chart below illustrates the mean rating of respondents by survey year.



σ = 1.869 in 2011; σ = 1.883 in 2012

The following chart shows the distribution of respondent ratings for 2011 and the 2012 results at each point along the rating scale.



	0	1	2	3	4	5	6	7	8	9	10
2012	0.6%	0.0%	2.8%	2.4%	12.8%	27.2%	16.0%	16.1%	11.6%	6.4%	4.0%
2011	0.7%	2.8%	1.0%	6.3%	4.1%	30.8%	16.6%	21.4%	10.5%	3.0%	2.7%

σ = 1.869 in 2011; σ = 1.883 in 2012

Opportunities for Expansion and Focus of Educational Programs

The two main purposes of this survey were to assess changes in the public's stormwater knowledge and related behavior from 2011 to 2012. These comparisons are needed because of the city's educational program and to develop priorities for future stormwater public education and outreach.

As in the baseline study, the results are organized by the percent of the respondents who provided a correct answer for the current survey—the lower the percent of correct answers given by the sample, the higher the priority for education:

- Priority 1 Issues: Less than 50% correct answers
- Priority 2 Issues: From 50 to 80% correct answers
- Priority 3 Issues: Over 80% correct answers

In administering the questionnaire, respondents were presented with statements that were either true or false and were asked if they agreed or disagreed with the statement. Each of the statements in the tables appearing below include a letter indicating the correct answer for that statement, an **A** for "Agree" and a **D** for "Disagree." When the word "**Adopt"** appears, it means the statement deals with whether respondents have "adopted" the desirable behavior mentioned in the statement. The combination of "**A Adopt**," then, means the question deals with behavior and the desired response is **A** for "Agree." This response equates to the respondent saying that he or she engages in the desired behavior mentioned in the statement.

Priority 1 Issues

Priority 1 issues represent areas of knowledge and behavior where less than half of the respondents provided the correct or desired response. The following table shows the percent of correct answers for Priority 1 issues in 2011 and 2012.

Priority 1 Issues (Based on 2011 Results)		
Question	% Correct	
	2012	2011*
Pollution in our rivers, wetlands and lakes is more the result of industrial dumping practices than individual human activity. **D**	35.0%	43.6%
The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	30.2%	31.0%
Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	38.5%	42.1%
Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	54.8%	46.5%
When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	51.2%	45.8%

**This table of Priority 1 issues is based on 2011 results. Thus, 2012 percentages may exceed 50%.*

Related Multivariate Analysis Findings

Statistically Significant Differences by Gender

- Males were more likely to give the correct response to the statement, "*Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste.*" (p-value < 0.001, Cramer's V = 0.437)

Multivariate Analysis		
Gender	Correct	Incorrect
Male	75.5%	24.5%
Female	31.9%	68.1%

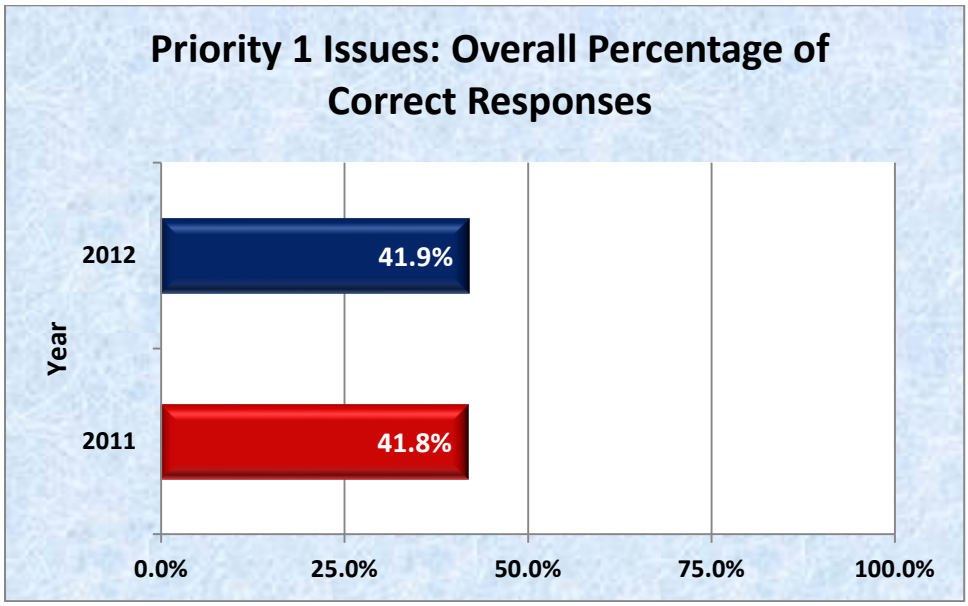
Statistically Significant Differences by Age Group

- Respondents ages 35 to 44 were statistically more likely to answer correctly to the statement, "*Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement.*" (p-value = 0.008, Cramer's V = 0.396)

Multivariate Analysis						
Response	Age Group					
	18-24	25-34	35-44	45-54	55-64	65+
Correct	15.4%	30.4%	70.0%	26.3%	57.1%	27.3%
Incorrect	84.6%	69.6%	30.0%	73.7%	42.9%	72.7%

Topics for Public Education: Priority 1

The overall percentage of respondents who answered correctly for the 2011 Priority I issues was calculated for the 2011 and 2012 surveys. The overall percent in 2011 of 41.8% increased to 41.9% in 2012.



σ = 0.063 in 2011; σ = 0.106 in 2012

Knowledge of how rivers, wetlands, lakes and the marine waters of Puget Sound become polluted by stormwater is an essential precursor to improving understanding, raising the desire to act responsibly, and bringing about behavioral change. Priority 1 educational programming and marketing campaigns should convey the following messages:

- *The water in stormwater drains is not connected to the sanitary sewer system nor is all stormwater treated to remove pollutants before being released into the environment. Therefore, the quality of stormwater going into the drainage system is what determines the level of pollution in surface water.*
- *The primary cause of pollution in stormwater runoff is individual human activity, not industrial dumping. Success in reducing environmental pollution depends upon everyone's participation in helping to make a difference.*
- *Biodegradable soap is not a safe addition to stormwater drains and should be kept from entering the stormwater drainage system.*
- *To best protect the environment, soapy water from washing a motor vehicle is best handled by allowing it to be absorbed by a lawn or the ground. It should not be allowed to flow into the street or into a drainage ditch.*
- *Bricks or pavers help to reduce the volume of stormwater runoff and, therefore, help to reduce stormwater pollution in the environment.*

Priority 2 Issues

Priority 2 issues represent areas of knowledge and behavior where 50% to 80% of the respondents provided the correct response. The table below shows the percent of correct answers for Priority 2 issues in 2011 and 2012.

Priority 2 Issues (Based on 2011 Results)		
Question	**% Correct**	
	2012	**2011***
Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	62.3%	60.7%
Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	67.4%	62.5%
The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	60.3%	64.0%
Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	64.5%	78.0%
An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	64.3%	58.5%
All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	55.7%	59.1%
Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	71.6%	71.9%
Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	63.2%	61.5%
Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	75.6%	77.4%
Grass clippings and leaves are not regarded as harmful in stormwater. **D**	42.8%	50.0%
Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	48.0%	53.3%
Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**	83.4%	67.2%

**This table of Priority 2 issues is based on 2011 results. Thus, 2012 percentages may fall out of the Priority 2 range between 50% and 80%.*

Related Multivariate Analysis Findings

Statistically Significant Differences by Survey Year

There were statistically significant differences in responses between survey years to the following priority 2 statements:

- "Using a mulching lawnmower reduces the need to fertilize a lawn." The percent of correct responses *decreased* from 78.0% in 2011 to 64.5% 2012. (p-value = 0.042, Cramer's V = 0.144)

- "Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff." The percent of correct responses *increased* from 67.2% in 2011 to 83.4% in 2012. (p-value = 0.009, Cramer's V = 0.185)

Statistically Significant Differences by Gender

- Males were more likely to give the correct response to the statement, "*Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap.*" (p-value < 0.001, Cramer's V = 0.436)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	86.8%	13.2%
Female	45.8%	54.2%

- Males were more likely to give the correct response than female respondents to the statement, "*The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors.*" (p-value = 0.005, Cramer's V = 0.278)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	73.1%	26.9%
Female	45.8%	54.2%

- Males were more likely to agree with the statement, "*An illicit or unlawful stormwater discharge is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater,*" which was the correct response. (p-value < 0.001, Cramer's V = 0.614)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	92.3%	7.7%
Female	33.3%	66.7%

- Males were more likely to give the correct response to the statement, "*All water going into stormwater drains on the street is treated before being discharged into the environment.*" (p-value = 0.003, Cramer's V = 0. 412)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	75.0%	25.0%
Female	34.0%	66.0%

- Males were more likely to disagree with the statement, "*Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater,*" which was the correct response. (p-value < 0.001, Cramer's V = 0.301)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	84.6%	15.4%
Female	57.4%	42.6%

- Males were more likely to give the correct response than female respondents to the statement, "*Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff.*" (p-value = 0.041, Cramer's V = 0.205)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	90.4%	9.6%
Female	75.0%	25.0%

- Males were also statistically more likely to answer correctly when asked if they agreed or disagreed with the statement, "*Chemical treatments to kill moss on roofs pose little risk for polluting stormwater,*" than female respondents. (p-value = 0.030, Cramer's V = 0.217)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	73.1%	26.9%
Female	52.1%	47.9%

- Males were more likely to give the correct response to the statement, "*Sediment or dirt in stormwater is natural and not regarded as pollution.*" (p-value = 0.016, Cramer's V = 0. 242)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	59.6%	40.4%
Female	35.4%	64.6%

- Males were more likely to give the correct response than female respondents to the statement, "*Carpet shampoo wastewater can be safely added to a stormwater drain.*" (p-value = 0.001, Cramer's V = 0.327)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	88.7%	11.3%
Female	60.4%	39.6%

Statistically Significant Differences by Age Group

- Respondents ages 25 to 34 were statistically more likely to answer incorrectly than any other age group to the statement, "*Grass clippings and leaves are not regarded as harmful in stormwater."* (p-value = 0.029, Cramer's V = 0.352)

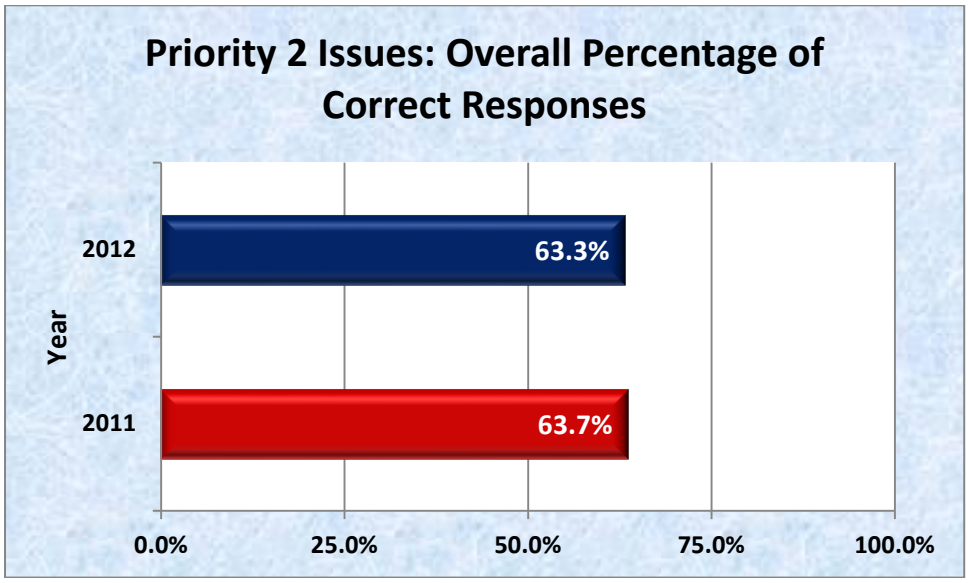
Multivariate Analysis						
Response	**Age Group**					
	18-24	**25-34**	**35-44**	**45-54**	**55-64**	**65+**
Correct	50.0%	13.0%	60.0%	55.0%	50.0%	40.0%
Incorrect	50.0%	87.0%	40.0%	45.0%	50.0%	60.0%

- Respondents ages 18 to 24 and 45 to 54 were statistically more likely to answer the following statement correctly than any other age group t, "*Chemical treatments to kill moss on roofs pose little risk for polluting stormwater."* (p-value = 0.049, Cramer's V = 0.335

Multivariate Analysis						
Response	**Age Group**					
	18-24	**25-34**	**35-44**	**45-54**	**55-64**	**65+**
Correct	84.6%	47.8%	47.4%	85.0%	64.3%	60.0%
Incorrect	15.4%	52.2%	52.6%	15.0%	35.7%	40.0%

Topics for Public Education: Priority 2

The average percentage of respondents who answered correctly for the 2011 Priority 2 issues was calculated for both the 2011 and 2012 surveys. The overall percent in 2011 of 63.7% decreased to 61.3% in 2012.



σ = 0.087 in 2011; σ = 0.111 in 2012

While more than half of the public responded correctly to these issues represents a desirable level of public knowledge, the goal remains to achieve a fully informed public. Consequently, Priority 2 issues continue to represent real opportunities for further public education and social marketing. Future educational and marketing campaigns addressing Priority 2 issues should contain the following messages:

- *Stormwater runoff is the leading cause of pollution in rivers, wetlands, and lakes.*
- *All water going into stormwater drains is not treated before being discharged into the environment.*
- *Hard surfaces, such as roads and driveways, are a significant source of stormwater pollution.*
- *Hard surfaces are significant contributors to pollution in stormwater runoff. Hence, it is important to keep hard surfaces clean using acceptable cleaning techniques and, where possible, use pervious surfaces.*

- *Vehicles should be washed at commercial facilities, not at homes where runoff is allowed to drain into the streets.*

- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*

- *The residue from chemical treatments that kill moss is a source of pollution.*

- *A mulching lawnmower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*

- *Proper disposal of used cleaning supplies, including carpet shampoo.*

- *An illicit or illegal discharge is anything that enters a storm drain system that is not made up entirely of stormwater.*

- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

- *Sediment and dirt are pollution and should be prevented from entering the stormwater drainage system.*

Priority 3 Issues

Priority 3 issues represent areas of knowledge or behavior where more than 80% of the respondents provided the correct response. The following table shows the percentage of correct answers for Priority 3 issues in 2011 and 2012.

Priority 3 Issues (Based on 2011 Results)		
Question	**% Correct**	
	2012	**2011***
When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	80.7%	85.4%
If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	81.5%	85.5%
My household recycles all used motor oil. **A Adopt**	87.9%	80.3%
My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	92.6%	93.2%
My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**	98.6%	98.2%
In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**	83.5%	91.1%
In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**	90.0%	93.2%
The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**	76.4%	81.8%
All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**	71.8%	82.0%
The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	79.9%	85.6%

**This table of Priority 3 issues is based on 2011 results. Thus, 2012 percentages may fall below 80%.*

Related Multivariate Analysis Findings

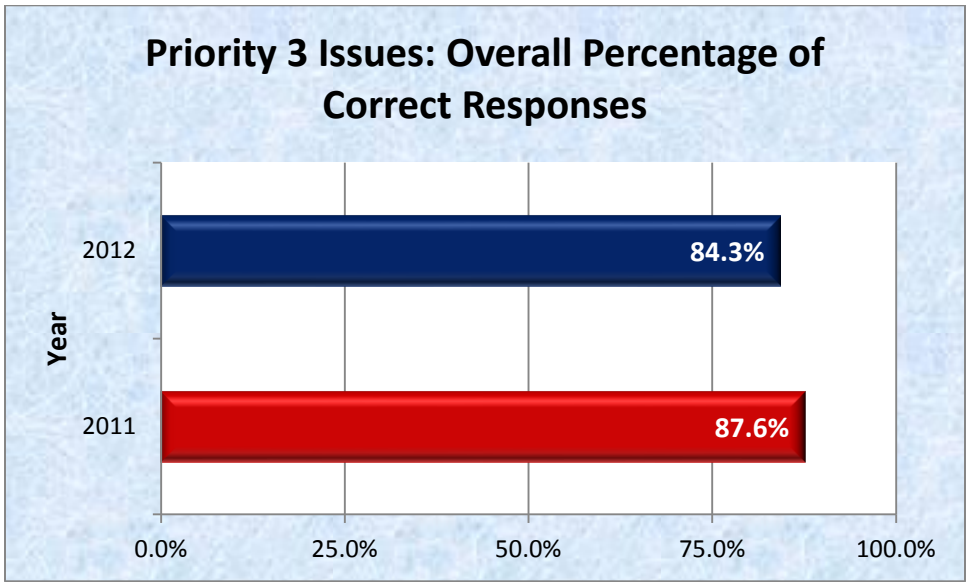
Statistically Significant Differences by Gender

- Male respondents were statistically more likely to give the correct response than females to the statement, "*The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can*." (p-value = 0.009, Cramer's V = 0.261)

Multivariate Analysis		
Gender	**Correct**	**Incorrect**
Male	86.8%	13.2%
Female	64.6%	35.4%

Topics for Public Education: Priority 3

The average percentage of respondents who answered correctly for the 2011 Priority 3 issues was calculated for both the 2011 and 2012 surveys. The overall percent in 2011 of 87.6% decreased to 84.3% in 2012.



σ = 0.060 in 2011; σ = 0.080 in 2012

The relatively high percent of respondents who gave the correct responses in this category suggests that high behavioral compliance continues to take place. At minimum, it can be said that respondents knew the right thing to do and answered accordingly. To maintain and increase positive behaviors, it remains advisable to continue educating the public on these issues. Because of the already high level of knowledge/compliance for Priority 3 issues, the degree of emphasis on these issues may be lower compared to Priority 1 and Priority 2 issues. If Priority 3 issues are addressed during educational and marketing campaigns, the following messages should be included:

- *Proper methods for cleaning up oil and grease spills, such as using kitty litter and paper towels.*
- *Store auto or truck parts with oil or grease on them under a roof or cover, store containers holding oil or antifreeze under a roof or cover.*
- *Pick up all pet waste when outside.*
- *Apply fertilizer, insecticides or weed killer at recommended rates.*
- *Fix auto or truck oil leaks within three weeks.*

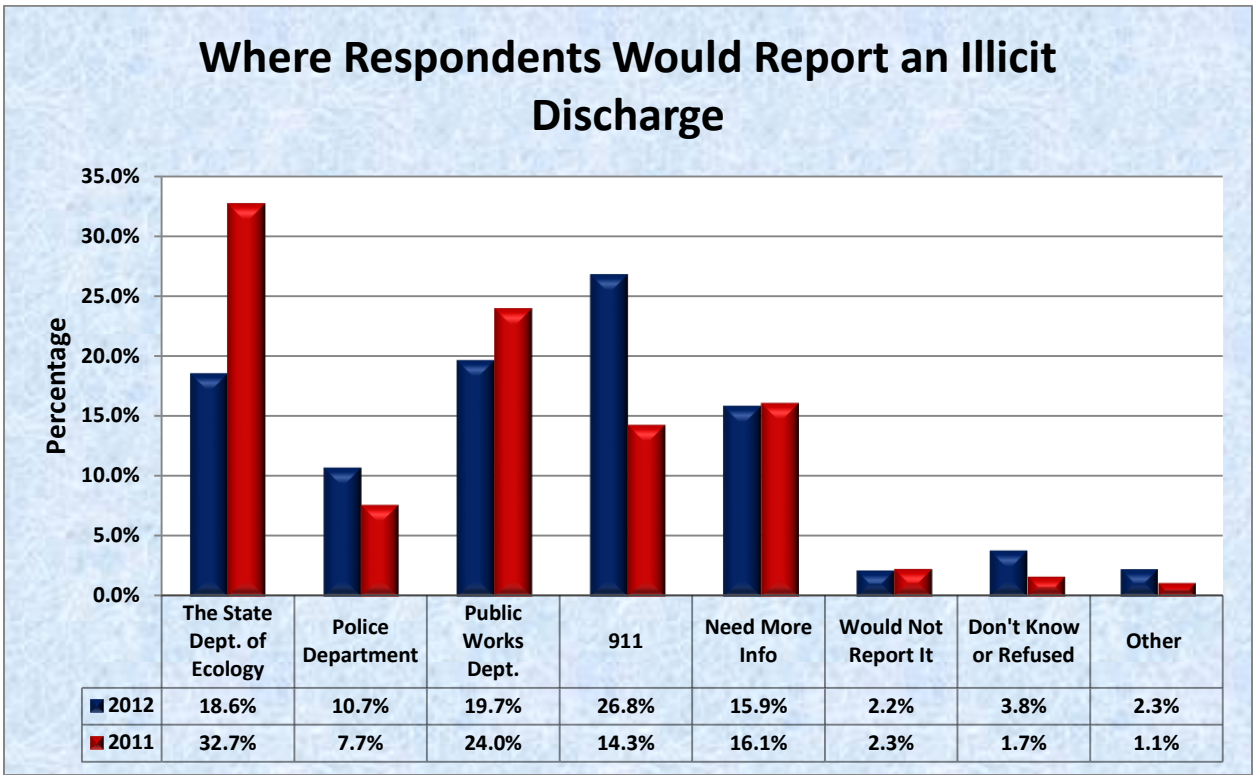
- *Recycle all used motor oil.*

- *Store all yard fertilizers and pesticides inside a building or in a covered area out of the rain.*

- *Fix house downspouts to dispense the water to an area where it can be absorbed by the ground.*

Reporting an Illicit Discharge

Respondents were asked the following question: *"If you witnessed someone pouring a gallon of used paint thinner into a stormwater drain, which agency would you call first to report it?"* A variety of options were given as choices. Only 19.7% of residents chose the correct choice, calling their City Public Works Department. This finding represents a 4.3% decrease from the 24.0% of Tukwila respondents who said they would contact the Public Works Department in 2011. Furthermore, 26.8% of respondents in 2012 would incorrectly report to 911 if they witnessed an illicit discharge. That is a 12.5% increase from the 14.3% of incorrect responses in 2011. The results indicate that most Tukwila residents remain unaware of the proper agency to call to report an illicit discharge.



	The State Dept. of Ecology	Police Department	Public Works Dept.	911	Need More Info	Would Not Report It	Don't Know or Refused	Other
2012	18.6%	10.7%	19.7%	26.8%	15.9%	2.2%	3.8%	2.3%
2011	32.7%	7.7%	24.0%	14.3%	16.1%	2.3%	1.7%	1.1%

There were no statistically significant differences in responses by age, gender, or survey year.

Business Research Results

Business Profile

As described in the research methodology section, three different types of businesses were involved in the survey. The following table depicts the types and the number of businesses that were included.

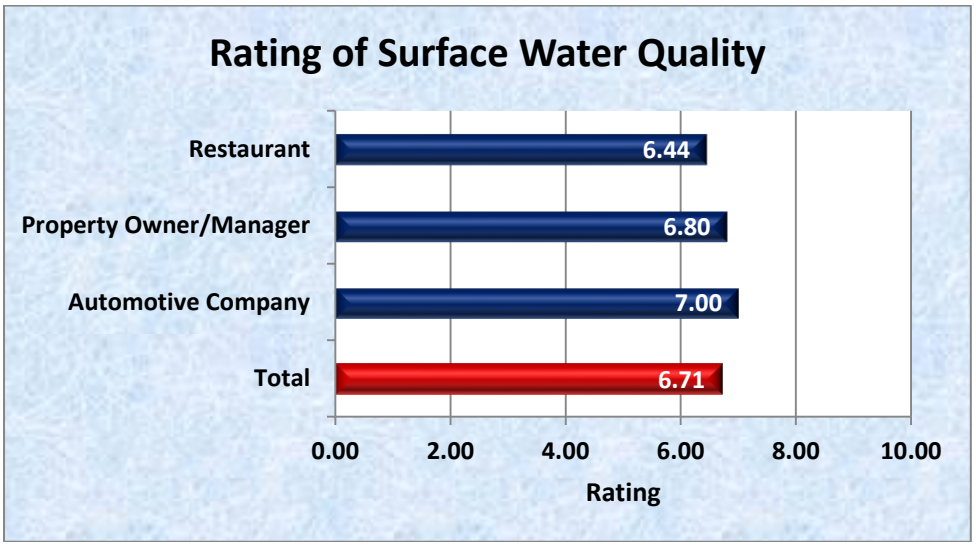
Business Survey Sample		
Business Type	**Count**	**Percentage**
Automotive	6	23.0%
Property	10	38.5%
Restaurant	10	38.5%
Total	**26**	**100%**

Of the business respondents administered the survey, the majority (69.2%) were males in the qualified position to participate. Below is a table that describes the business sample by gender.

Business Demographic - Gender	
Gender	**Percentage**
Male	69.2%
Female	30.8%

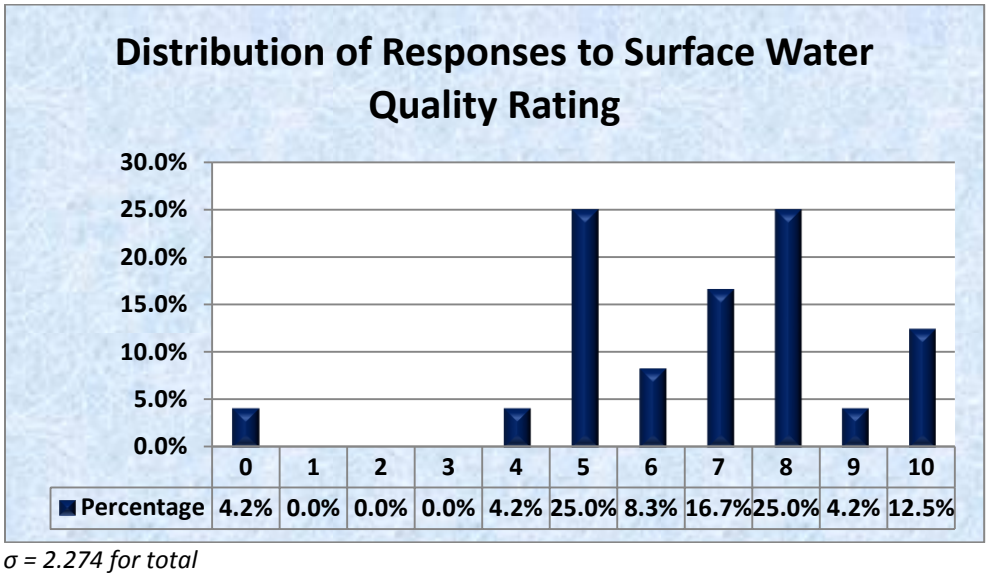
Business Assessment of Water Quality in the Environment

Business Respondents were asked to rate the quality of water in Tukwila's rivers, wetlands, and lakes on a 0-10 numeric scale where 0 meant "extremely polluted" and 10 meant "extremely clean." As a whole, businesses gave a 6.71 average rating for surface water quality. Ratings for each business type can be seen in the chart below. The difference in mean ratings for each business type was not statistically significant.



σ = 2.877 for Restaurants; σ = 2.150 for Property; σ = 1.581 Automotive; σ = 2.274 for total

The following chart shows the distribution of business respondent ratings at each point along the rating scale.



σ = 2.274 for total

General Questions

The survey consisted of ten questions that were considered general stormwater questions applicable to all business types. The following table describes the percent of correct responses by company type. In addition, the combined percentages are included to represent business stormwater knowledge and behavior as a whole.

Correct Responses to General Questions - By Business Type				
General Questions	**Restaurant**	**Property Owner or Manager**	**Automotive**	**Combined Average**
Sediment in stormwater is natural and not regarded as pollution. **D**	0.0%	20.0%	0.0%	7.7%
An illicit or unlawful discharge is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	40.0%	40.0%	50.0%	42.3%
Non-toxic, biodegradable soaps do not pollute stormwater runoff. **D**	40.0%	30.0%	66.7%	42.3%
A key principle for effective stormwater management is to reduce the amount of stormwater runoff. **A**	40.0%	60.0%	33.3%	46.2%
My business has spill kits readily available in case of a hazardous spill. **A Adopt**	88.9%	33.3%	100%	70.8%
Vegetation reduces stormwater pollution. **A**	80.0%	70.0%	66.7%	73.1%
Sometimes wash or wastewater from our business ends up in the parking lot, alley, street, or in a ditch. **D Adopt**	70.0%	88.9%	66.7%	76.0%
Areas outside my business are swept regularly with a broom, vacuum or mechanical sweepers instead of pressure washing and letting the waste water go down a storm drain. **A Adopt**	90.0%	88.9%	100%	92.0%
My employees have been trained properly on how to clean up hazardous spills. **A Adopt**	88.9%	100%	100%	95.8%
The trash container area outside is in a contained area and does not leak. **A Adopt**	100%	100%	83.3%	96.2%

Restaurant Priority Issues

The table below includes correct response results for all restaurant questions. The table has been segmented into Priority 1, Priority 2, and Priority 3 Issues.

Restaurants	
Question	**% Correct**
Priority 1 Issues	
Sediment in stormwater is natural and not regarded as pollution. **D**	0.0%
An illicit or unlawful discharge is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	40.0%
Non-toxic, biodegradable soaps do not pollute stormwater runoff. **D**	40.0%
A key principle for effective stormwater management is to reduce the amount of stormwater runoff. **A**	40.0%
External washwater disposal is an illicit discharge. **A**	40.0%
Priority 2 Issues	
Sometimes wash or wastewater from our business ends up in the parking lot, alley, street, or in a ditch. **D Adopt**	70.0%
Vegetation reduces stormwater pollution. **A**	80.0%
A proper way of disposing cooking oil and grease is through the stormwater system. **D**	80.0%
Priority 3 Issues	
My employees have been trained properly on how to clean up hazardous spills. **A Adopt**	88.9%
My business has spill kits readily available in case of a hazardous spill. **A Adopt**	88.9%
Areas outside my business are swept regularly with a broom, vacuum or mechanical sweepers instead of pressure washing and letting the waste water go down a storm drain. **A Adopt**	90.0%
Wet mops are properly cleaned and stored. **A**	90.0%
The trash container area outside is in a contained area and does not leak. **A Adopt**	100%
Wash water is disposed of into an internal building drain connected to the sanitary sewer system and not into the exterior stormwater system **A Adopt**	100%
The dumpster at my restaurant is always closed after use. **A**	100%

Property Owner/Manager Priority Issues

The table below includes correct response results for all property owner and manager questions. The table has been segmented into Priority 1, Priority 2, and Priority 3 Issues.

Property Owner/Manager	
Questions	**% Correct**
Priority 1 Issues	
Sediment in stormwater is natural and not regarded as pollution. **D**	20.0%
My complex has a designated area for residential car washing. **A**	20.0%
Non-toxic, biodegradable soaps do not pollute stormwater runoff. **D**	30.0%
My business has spill kits readily available in case of a hazardous spill. **A Adopt**	33.3%
An illicit or unlawful discharge is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	40.0%
Which one of the following three methods is generally most desirable for controlling stormwater: Option 3 - Infiltration, landscaping, and/or reduction of impervious surfaces **A**	40.0%
Priority 2 Issues	
In the last 12 months, my complex has implemented landscaping techniques to improve the absorption of rainwater. **A Adopt**	50.0%
Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	50.0%
A key principle for effective stormwater management is to reduce the amount of stormwater runoff. **A**	60.0%
Vegetation reduces stormwater pollution. **A**	70.0%
Priority 3 Issues	
Areas outside my business are swept regularly with a broom, vacuum or mechanical sweepers instead of pressure washing and letting the waste water go down a storm drain. **A Adopt**	88.9%
Sometimes wash or wastewater from our business ends up in the parking lot, alley, street, or in a ditch. **D Adopt**	88.9%
Resident car washings are discouraged on site and suggested alternatives are provided. **A Adopt**	90.0%
My employees have been trained properly on how to clean up hazardous spills. **A Adopt**	100%
The trash container area outside is in a contained area and does not leak. **A Adopt**	100%

Automotive Priority Issues

The table below includes correct response results for all automotive questions. The table has been segmented into Priority 1, Priority 2, and Priority 3 Issues.

Automotive	
Questions	**% Correct**
Priority 1 Issues	
Sediment in stormwater is natural and not regarded as pollution. **D**	0.0%
The best way to clean up small quantities of spilled oil is to fully absorb it using kitty litter or absorbent pads and deposit this waste in a garbage can. **A**	33.3%
A key principle for effective stormwater management is to reduce the amount of stormwater runoff. **A**	33.3%
Priority 2 Issues	
An illicit or unlawful discharge is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	50.0%
Non-toxic, biodegradable soaps do not pollute stormwater runoff. **D**	66.7%
Vegetation reduces stormwater pollution. **A**	66.7%
Sometimes wash or wastewater from our business ends up in the parking lot, alley, street, or in a ditch. **D Adopt**	66.7%
Scrubbing oil and grease spots on concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**	66.7%
When cleaning a vehicle, rinsewater, having little soap and dirt, can be safely added to a stormwater drain. **D**	80.0%
Priority 3 Issues	
My Company disposes of all oils, chemicals, and other fluids through an approved disposal facility. **A Adopt**	83.3%
If a car or truck in our business is dripping oil, the leak is always contained immediately and fixed in a timely manner. **A Adopt**	83.3%
All vehicles, mechanical parts and equipment stored outside are checked for leaks at least once a month. **A Adopt**	83.3%
The trash container area outside is in a contained area and does not leak. **A Adopt**	83.3%
My employees have been trained properly on how to clean up hazardous spills. **A Adopt**	100%
My business has spill kits readily available in case of a hazardous spill. **A Adopt**	100%
Areas outside my business are swept regularly with a broom, vacuum or mechanical sweepers instead of pressure washing and letting the waste water go down a storm drain. **A Adopt**	100%
All mechanic work is done indoors and under cover. **A Adopt**	100%
The area where my business washes vehicles allows the rinsewater to flow to the proper sanitary sewer system. **A Adopt**	100%
My business stores all oils, soaps, chemicals, and other materials (like batteries and car parts) under a roof or cover or in a containment area. **A Adopt**	100%
In my business, all waste, such as the particle dust from sanding or grinding, and all worn out car parts, such as old transmissions, radiators or brake pads, are all stored in a covered area out of the rain until disposed of. **A Adopt**	100%

Conclusions

1) The public perception in Tukwila is that the surface water is relatively clean and free of pollutants. Although the lowest rating was given in 2011 at 5.82, the overall rating increased to 6.00 in 2012. Respondents are indicating that the perception of surface water is, at the very least, moderately clean.

2) As mentioned in the results section, in order to keep the analysis consistent, the questions involved in the priority 1 issues for 2012 were determined by the 2011 results. However, the 2012 data revealed shifts in Priority classifications from the 2011 results.

3) In 2012, two statements shifted from Priority 1 issues to Priority 2 issues. That is, responses to two statements in 2011 that were considered Priority 1 issues are now considered Priority 2 issues in 2012. The following are the statements described above:
   - *Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste.*
   - *When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street.*

   Furthermore, the results showed shifts from Priority 2 issues in 2011 down to Priority 1 issues in 2012 and shifts from Priority 2 issues in 2011 up to Priority 3 issues in 2012. The following are the statement shifts:

   Priority 2 statements in 2011 shifted down to 2012 Priority 1 Issues
   - *Grass clippings and leaves are not regarded as harmful in stormwater.*
   - *Sediment or dirt in stormwater is natural and not regarded as pollution.*

   Priority 2 statement in 2011 shifted to 2012 Priority 3 issue
   - *Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff.*

   Lastly, the 2012 results showed shifts down from Priority 3 issues to Priority 2 issues. The following three statements were Priority 3 issues in 2011 and shifted to Priority 2 issues in 2012:
   - *The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can.*
   - *All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover.*
   - *The downspouts at my house convey the water to an area where it is absorbed by the ground.*

4. The public's knowledge in Tukwila regarding which agency to report an illicit discharge may need more attention. In both years the survey was conducted, less than one-quarter of respondents answered correctly. At the very least, this is should be a concern seeing as the majority of Tukwila residents do not know who to contact in regards to illicit stormwater discharges.

5. Priority 1, 2, and 3 issues are presented in the tables under the business survey results section. The Priority issues are segmented by business type.

Appendix A: Tukwila Community Survey

Tukwila
Storm Water Community Survey
Questionnaire - 2012

Hello, my name is _____ and I am calling on behalf of the city of _____ (Tukwila)
[IF SPEAKING TO A CHILD] May I speak to someone who is at least 18 years of age? Thank you. **[RE-INTRODUCE YOURSELF]**
Hello, my name is _____ and I am calling on behalf of the city of _____ (Tukwila) We are asking citizens about an important environmental issue and we would like to include your opinions. All your answers are strictly confidential and will not be connected to your name.

S1. **[SCREENING QUESTION]** Before we actually begin, I need to verify your city. What city do you live in?

1. Survey city (Tukwila)
2. Other City **[THANK AND POLITELY DISCONTINUE]**
3. Don't Know **[THANK AND POLITELY DISCONTINUE]**
4. Refused **[THANK AND POLITELY DISCONTINUE]**

1. What is your age? **[RECORD NUMBER]**

2. Great, thank you. My first question is about the water in our area. I'd like you to rate your perception of the overall quality of the water in our rivers, wetlands and lakes. By "quality of water" I mean how free it is from pollution. Rate it on a 0 to 10 scale where "0" means the water is "extremely polluted" and 10 means the water is "extremely clean." **[RECORD NUMBER]**

[READ]
Now, I'm going to read a number of statements to you regarding stormwater. Some of these statements may be true, they all may be true or they all may be false. If you believe that a statement is true, please say "Agree." If you believe the statement is false, say "Disagree." If you are not certain about the statement and need more information, you can answer with "need more information." If the question does not apply to you or your family, say "Doesn't Apply." Here is the first one. Do you Agree, Disagree or need more information about the following statement:

Responses for each:

1. Agree

2. Disagree
3. Need more information
4. Uncertain, Don't Know
5. Refused
6. Doesn't Apply

NOTE: A letter follows each statement below indicating the correct answer for that statement, an **A** for "Agree" and a **D** for "Disagree." When the word **Adopt** appears, it means the statement deals with whether respondents have "adopted" the desirable behavior mentioned in the statement. The combination of **A Adopt**, then, means the question deals with behavior and the desired response is **A**gree—which equates to the respondent saying that he or she engages in the desired behavior mentioned in the statement.

3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**

4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**

5. Pollution in our rivers, wetlands and lakes is more the result of industrial dumping practices than individual human activity. **D**

6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**

[ROTATE Q7-Q28] [NOTE: These questions will be asked in a random order to prevent sequencing bias.]

[AFTER ASKING THE NEXT NINE QUESTIONS, SAY: You are doing really well. We are halfway through and I'll try to get through this as quickly as I can. Here's the next one, do you Agree, Disagree or Need More Information about this statement.]

7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**

8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**

9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**

10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**

11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**

12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**

13. My household recycles all used motor oil. **A Adopt**

14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**

15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**

16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**

17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**

18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**

19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**

20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**

21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**

22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**

23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**

24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**

25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**

26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**

27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**

28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**

29. An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**

30. If you witnessed someone pouring a gallon of used paint thinner into a stormwater drain, which agency would you call first to report it: **[READ 1-5]**

1. The Washington Department of Ecology
2. The police department
3. The city Public Works Department **A**
4. 911
5. Need more information
6. I would not report it
7. Don't Know
8. Refused

That concludes our survey. I want to thank you very much for your time and cooperation. You have been very helpful. Have a good day!

POSTCODE GENDER:
1. MALE
2. FEMALE

DATE: _____INTERVIEWER: _____

Appendix B: Tukwila Business Survey

BUSINESS STORMWATER MARKET RESEARCH
TUKWILA

Initial Target Quota Cells

#	Sample Category	Completes	# of Questions
1	Restaurants	7-9	TBD
2	Property Owners/ Managers	7-9	TBD
3	Automotive Companies	7-9	TBD
	TOTAL	21-27	TBD

Hello, may I speak to **[INSERT NAME ON SAMPLE]**?

IF NOT AVAILABLE, ARRANGE A CALLBACK.

Hello, my name is _____ and I am calling on behalf of the city of Tukwila. We are asking businesses to provide input on important environmental issues and would like to include your opinion. We would like to speak to the individual in your business who is most knowledgeable about how your business deals with garbage, hazardous waste, and stormwater-related issues.

S1. Would that be you?

1. Yes **[SKIP TO S3]**
2. No
3. We do not deal with stormwater issues at all
4. Don't Know/Refused

S2. May I speak to this individual?

1. Yes
2. No **[SCHEDULE A CALLBACK]**
3. Don't Know/Refused **[SCHEDULE A CALLBACK]**

REPEAT INTRODUCTION WHEN SPEAKING TO CORRECT INDIVIDUAL
Hello, my name is _____ and I am calling on behalf of the city of Tukwila. We are asking businesses to provide input on important environmental issues and would like to include your opinion. We would like to speak to the individual in your business who is most knowledgeable about how your business deals with garbage, hazardous waste and stormwater-related issues, so you are the person we need to talk to.

S3. May I ask you some questions?
1. Yes
2. No **[ASK TO BE REFERRED TO CORRECT INDIVIDUAL OR POLITELY DISCONTINUE]**
3. Don't Know/Refused **[ASK TO BE REFERRED TO CORRECT INDIVIDUAL OR POLITELY DISCONTINUE]**

1. Good! Your input is strictly confidential and will not be attached to your name or business.
[SHOW NAME OF BUSINESS CATEGORY ON SCREEN]
[ENTER NUMBER FOR BUSINESS CATEGORY] You will be in our category labeled:
   1. Restaurant
   2. Property Owner/Manager
   3. Automotive Company

2. My first question is about the water in our area. I'd like you to rate your perception of the overall quality of the water in our rivers, wetlands, and lakes. By "quality of water" I mean how free it is from pollution. Rate it on a 0 to 10 scale where "0" means the water is "extremely polluted" and 10 means the water is "extremely clean."**[READ]**

   What I am going to do is read a number of statements to you. If you believe that a statement is true, please say "Agree." If you believe the statement is false, say "Disagree." If you are not certain about the statement and need more information, you can answer with "need more information." If the question does not apply to you or your business, say "Doesn't Apply." Here is the first one. Do you Agree, Disagree or need more information about the following statement:

Responses for each:

1. Agree
2. Disagree
3. Need more information
4. Doesn't Apply
5. Don't Know/Refused

3. An illicit or unlawful discharge is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**

4. Non-toxic, biodegradable soaps do not pollute stormwater runoff. **D**

5. My employees have been trained properly on how to clean up hazardous spills. **A Adopt**

6. My business has spill kits readily available in case of a hazardous spill. **A Adopt**

7. Areas outside my business are swept regularly with a broom, vacuum or mechanical sweepers instead of pressure washing and letting the waste water go down a storm drain. **A Adopt**

8. The trash container area outside is in a contained area and does not leak. **A Adopt**

9. Sediment in stormwater is natural and not regarded as pollution. **D**

10. Vegetation reduces stormwater pollution. **A**

11. A key principle for effective stormwater management is to reduce the amount of stormwater runoff. **A**

12. Sometimes wash or wastewater from our business ends up in the parking lot, alley, street, or in a ditch. **D Adopt**

[INFO: Examples of 'wash' or 'wastewater' are the soapy runoff from washing a car, the rinse water from mopping a floor, the dirty water from washing the paint out of a paint brush, water used in a manufacturing process--generally, water that has something additional in it beyond plain water that you want to dispose of.]

13. **[ASK ONLY IF RESTAURANT COMPANY]** Wash water is disposed of into an internal building drain connected to the sanitary sewer system and not into the exterior stormwater system **A Adopt**

14. **[ASK ONLY IF RESTAURANT COMPANY]** Wet mops are properly cleaned and stored. **A**

15. **[ASK ONLY IF RESTAURANT COMPANY]** The dumpster at my restaurant is always closed after use. **A**

16. **[ASK ONLY IF RESTAURANT COMPANY]** A proper way of disposing cooking oil and grease is through the stormwater system. **D**

17. **[ASK ONLY IF RESTAURANT COMPANY] [AFTER ANSWERING THIS QUESTION, SKIP TO Q 33]** External washwater disposal is an illicit discharge. **A**

18. **[ASK ONLY IF PROPERTY OWNER/MANAGER]** Resident car washings are discouraged on site and suggested alternatives are provided. **A Adopt**

19. **[ASK ONLY IF PROPERTY OWNER/MANAGER]** My complex has a designated area for residential car washing. **A**

20. **[ASK ONLY IF PROPERTY OWNER/MANAGER]** In the last 12 months, my complex has implemented landscaping techniques to improve the absorption of rainwater. **A Adopt**

21. **[ASK ONLY IF PROPERTY OWNER/MANAGER]** Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**

22. **[ASK ONLY IF PROPERTY OWNER/MANAGER]** Which one of the following three methods is generally most desirable for controlling stormwater: **[READ 1-3] [ACCEPT ONLY ONE] [AFTER ANSWERING THIS QUESTION, SKIP TO Q 33]**
    1. A detention pond facility
    2. Offsite management, for example in a ditch or larger storm sewer
    3. Infiltration, landscaping, and/or reduction of impervious surfaces **A**
    4. Need more information
    5. Don't Know
    6. Refused

23. **[ASK ONLY IF AUTOMOTIVE COMPANY]** When cleaning a vehicle, rinsewater, having little soap and dirt, can be safely added to a stormwater drain. **D**

24. **ASK ONLY IF AUTOMOTIVE COMPANY]** My Company disposes of all oils, chemicals, and other fluids through an approved disposal facility. **A Adopt**

25. **[ASK ONLY IF AUTOMOTIVE COMPANY]** The best way to clean up small quantities of spilled oil is to fully absorb it using kitty litter or absorbent pads and deposit this waste in a garbage can. **A**

26. **[ASK ONLY IF AUTOMOTIVE COMPANY]** All mechanic work is done indoors and under cover. **A Adopt**

27. **[ASK ONLY IF AUTOMOTIVE COMPANY]** Scrubbing oil and grease spots on concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**

28. **[ASK ONLY IF AUTOMOTIVE COMPANY]** The area where my business washes vehicles allows the rinsewater to flow to the proper sanitary sewer system. **A Adopt**

29. **[ASK ONLY IF AUTOMOTIVE COMPANY]** My business stores all oils, soaps, chemicals, and other materials (like batteries and car parts) under a roof or cover or in a containment area. **A Adopt ["Cover" means shielded from rain. A "containment area" is a space surrounded by a wall that is constructed to prevent any spilled fluid from passing beyond it.]**

30. **[ASK ONLY IF AUTOMOTIVE COMPANY]** If a car or truck in our business is dripping oil, the leak is always contained immediately and fixed in a timely manner. **A Adopt**

31. **[ASK ONLY IF AUTOMOTIVE COMPANY]** In my business, all waste, such as the particle dust from sanding or grinding, and all worn out car parts, such as old transmissions, radiators or brake pads, are all stored in a covered area out of the rain until disposed of. **A Adopt**

32. **[ASK ONLY IF AUTOMOTIVE COMPANY]** All vehicles, mechanical parts and equipment stored outside are checked for leaks at least once a month. **A Adopt**

DEMOGRAPHICS

33. What is your title?
34. What is your first name? **[NAME IS CONFIDENTIAL AND NOT REPORTED WITH RESPONSES]**

That concludes our survey. On behalf of the city of Tukwila, I want to thank you very much for your time and cooperation. You have been very helpful. Have a good day!

POSTCODE GENDER:
1. MALE
2. FEMALE

DATE: _____INTERVIEWER: _____