

Note: This report provides a summary of the drinking water monitoring conducted during 2012 only. For a comprehensive review of past monitoring, please see the 2010 report.

The City of Spokane's water is of very high quality. Many different tests are conducted at varying intervals to

REPORT ON CITY OF SPOKANE DRINKING WATER FOR 2012

Reported by Doug Greenlund, Environmental Analyst 1 April 2013

confirm that the City's drinking water meets Washington state and federal EPA drinking water quality standards. The City drinking water supply, to date, has consistently met federal standards. This report is meant to provide consumers and other interested parties with insight into what analytical tests have been conducted and, in some cases, substances that have been detected. The state and federal Maximum Contaminant Level (MCL) information is provided as a risk benchmark. Appendix II of the 2010 Drinking Water Report has a comprehensive list of substances tested in City water.

English:

This report contains important information about the drinking water supplied by the City of Spokane. Translate it, or speak with someone who understands it well.

Spanish:

Este reporte contiene información importante acerca del agua potable suministrada por la Ciudad de Spokane. Tradúzcalo, o hable co n alguien que lo entiende bien. (Para ver información adicional, visite al; www.epa.gov/espanol/ciudadanos.html

Russian:

В этом отчете содержится важная информация относительно питьевой воды, поставляемой службой города Спокэн. Переведите этот отчет или поговорите с тем, кто его хорошо понимает.

Vietnamese:

Bản phúc trình này chứa đựng những thông tin quan trọng về nước uống được cung cấp bởi City of Spokane. Hãy phiên dịch, hay hỏi thăm người nào hiểu rõ về tài liệu này. This report also summarizes the amount of water the City used in 2012 and documents some indicators to show the progress being made to meet conservation goals adopted by the City in its Water Stewardship Strategic Plan.

The final pages (appendices) of this report summarize the most recent analytical testing. Appendix II summarizes the testing completed during 2012. Appendix III provides a summary of inorganic testing results. Appendix IV provides the results from distribution system disinfection by-product testing. The following narrative and attachments summarize and explain recent results in more detail. Appendix V and the last two pages of this narrative (General Information) contain information relevant to the annual Consumer Confidence Report. As such, the information may be redundant, relative to the main text of this report.

All of the City of Spokane's drinking water comes from the Spokane Valley-Rathdrum Prairie Aquifer - designated a sole source aquifer in 1978. The Spokane Valley-Rathdrum Prairie Aquifer slowly flows through two different states and a number of different counties and is the source water for a large number of water purveyors including the City of Spokane. This water and any contaminants freely move across political boundaries. Many groups and/or private individuals may claim this water to be used for diverse purposes. Some of these competing interests include (but are not limited to) drinking water rights, irrigation, fisheries, hydroelectric power, and industrial processes. The Spokane Aquifer (that portion of the larger aquifer lying within Washington State) and the Spokane River exchange water. While the aquifer contains a large volume of water, many factors play into the volume of water in the Spokane River complicating the management of these resources. Some of these factors include pumping for irrigation and potable water, hydroelectric dam operations, and the variations of

CITY OF SPOKANE - ENVIRONMENTAL PROGRAMS

2nd Floor City Hall; 808 W. Spokane Falls Blvd.; Spokane, WA 99201-3334; (509) 625-6570; FAX (509) 343-5760



weather and precipitation. The rates and locations of exchange between the aquifer and the Spokane River have been reexamined as part of the Bi-State Aquifer Study. In January 2008, the states of Washington and Idaho announced signing a Memorandum of Agreement (www.idwr.idaho.gov/WaterInformation/projects/svrp/PDFs/svrp_MOA_10-26-07.pdf) concerning the "...continued coordination involving the maintenance and improvement of the technical tools developed in a bi-state water study." Discussions to agree on how to utilize these technical tools to manage this valuable resource will continue. The results of these studies and agreements will help give the City information it needs to continue to supply high-quality water to the citizens of Spokane.

Due to the porous nature of the ground surface and the number of potential contaminant sources, the possibility of contaminating the aquifer exists if good housekeeping measures are not followed for all activity over and adjacent to the aquifer. The physical and economic health of our area depends on the quality of our drinking water. In order to safeguard water quality, the City continues its efforts to make available to the community information about, and appropriate disposal mechanisms for, dangerous wastes that are generated in the Aquifer Sensitive Area. The City, in cooperation with other local governments and the Spokane Aquifer Joint Board, continues to work toward strengthening regulations for the storage and use of critical materials to safeguard the local water supply.

City of Spokane Water Department www.spokanewater.org/ (509) 625-7800 City of Spokane-Environmental Programs (509) 625-6570 www.greenspokane.org/ www.spokanecounty.org/WQMP/ Spokane County - Water Resources (509) 477-3604 Spokane Regional Health District www.srhd.org/services/environment.asp (509) 324-1560 Environmental Health Div. Washington State Department of Health www.doh.wa.gov/ehp/dw/default.htm (509) 329-2100 Eastern Regional Office (Drinking Water) Washington State Department of Ecology -(509)329-3400 www.ecy.wa.gov/ Eastern Regional Office water.epa.gov/drink/index.cfm U.S. EPA Safe Drinking Water Hotline 1-800-426-4791

For further information regarding the City of Spokane's drinking water or related issues:

REPORT ON CITY OF SPOKANE DRINKING WATER FOR 2012

CONTENTS

Introduction	2
QUANTITY - Water for the Future	
Water Stewardship Strategic Goals Assessment	4
Distribution System Leakage	
QUALITY - Drinking Water an Invaluable Community Resource	
Inorganics	
Arsenic, Lead Copper, Nitrate-Nitrogen, Phosphorus	
Radionuclides & Radon	
Radionuclides, Radon	
Organics	
Disinfection By-Products Distribution System, MtBE (Methyl tert-Butyl Ether),	
Other Volatile Organics	
Synthetic Organics,	
Microbiological Contaminants	
Coliform Bacteria-Source, Heterotrophic Plate Count Bacteria-Source	
Distribution System-Coliform Bacteria, Protozoa	
General Information	

APPENDICES

Appendix I - Water System Use	21-22
Appendix II - Summary of Completed Quarterly Monitoring 2012	
Appendix III - Drinking Water Inorganics Summary (Certified Laboratory)	
Appendix IV - Stage 2 Distribution System Disinfection Byproducts	
Appendix V - Contaminants found in Drinking Water Testing in 2012	

To obtain free software to read some of these digital files:

- Adobe Acrobat files: <u>www.adobe.com/products/acrobat/readstep2.html</u>
- Microsoft Word files: www.microsoft.com/downloads/details.aspx?FamilyID=3657ce88-7cfa-457a-9aec-f4f827f20cac&displaylang=en

QUANTITY - Water for the Future



Our Water. Our Future. Our Priority.

As a result of the increasing recognition of the limits to our groundwater resources, the state has encouraged local interests and authorities to come together to manage this resource. The City of Spokane has taken an active role in area-wide partnerships to safeguard the quality and quantity of our water supply. The City of Spokane and all its water customers are challenged to use water resources wisely and responsibly. The City of Spokane Water Stewardship Program was established by resolution of the City Council on May 1, 2006 (Resolution 06-49).

Changes in federal building standards have resulted in water savings nationwide. The City's Building Services Dept. enforces these standards. The City of Spokane Water Department has taken additional steps to conserve water through education programs, metering water use, reducing the loss of water resulting from leaking pipes, and implementing a conservation-oriented rate structure. The Water Use Efficiency Rule (WAC 246-290-810) requires that municipal water suppliers adopt a plan to make more efficient use of their water. Two of the quantifiable elements are discussed in this section.

GOALS

The City of Spokane adopted the Water Stewardship Strategic Plan on May 1, 2006. This Plan includes goals for per capita reductions in water use. The goals are based on per capita consumption for all uses including residential, commercial, industrial, and government. These goals are for reducing the water consumption by 2017 and are specified for seasonal periods of October through March, April through June, and July through September. The goals for these periods are different, as is the per capita water use.

The October through March timeframe is typically a period of mostly indoor water use. The amount used during this period is nearest the water use essential for health and safety. Furthermore, a modest, but increasing rate of growth for our community is assumed.

The April through June timeframe is a transitional period from mostly indoor use to increasing outdoor use.

The July through September period includes of increasing demand for outdoor irrigation. This is also the most critical period for flows in the Spokane River. The per capita reduction in water use for this period is the most ambitious.

The detailed source water pumping totals versus the adopted Water Stewardship Goals are in Appendix I. The following table and graphs illustrates this information for 2012:

WATER YEAR	2012 pumpage (x1,000 gallons)		
Period	Total	Goal	Result
October 2011 through March 2012 (winter)	6,910,801	6,970,000	-0.8%
April through June (spring)	5,184,227	6,930,000	-25.2%
July through September (summer)	9,164,570	8,670,000	5.7%
Sum of seasonal totals	21,259,598		

The preceding table shows the difference between the Goal and the actual Use as a percentage. A positive value equals exceedances of the goal. Total pumpage for the periods for 2002 - 2012 is available in Appendix I.

It is our estimate that the City, while continuing to show improvement, did not achieve its water conservation pumpage goal for 2012, specifically for the timeframe of July – September 2012. The following graph demonstrates the total pumpage vs. goals for each season for 2006 thru 2012.



Daily per Person Water Pumpage by Conservation Goal Period based on Projected Water Service Area Population

In 2012, the City met the conservation goal for the winter period of October 2011 through March 2012. This was the fourth consecutive year for meeting this conservation goal.

The City of Spokane has consistently met the conservation goal for the months of April, May and June. The City met its goal for April through June again in 2012.

The City did not meet its goal for July through September in 2012. To date, the City has not met its goal for July through September. Note that the rate of water use reduction is most ambitious during this season.

It is important to note that the commitment taken on by the City is based on per capita usage and the actual population served in 2012 is not immediately known. However, an indicator of population would be the number of single-family residences served. The following table provides the number of single-family residences over the last 11 years. Please note that the number of residences is typically lower in the winter because some local residents go south for the winter, and during that time, such residences are not counted as "connections."

	no. of service locations (Jan. & Feb.)	no. of service locations (Aug. & Sept.)
2002	57,239	58,418
2003	57,238	58,747
2004	57,978	59,259
2005	58,403	59,914
2006	59,231	60,883
2007	59,881	61,459
2008	60,435	61,581
2009	60,683	61,585
2010	60,608	61,810
2011	60,492	61,671
2012	60,478	61,822

In addition to total population served, seasonal weather variations impact water use. The following graph illustrates daily usage (City of Spokane billing records) in single-family residences during the summer for the period 2002-2012:



Summer (Aug & Sept) 2002 to 2012 Weather Related Variations in Water Usage in Single Family Residences

The preceding graph compares water usage of single-family residences with temperature (i.e. cooling degree days). The residential use had declined steadily for several years, but in 2012 the per day use increased. There was very little Water Stewardship Program messaging in 2012.

	Single family residence			
	Gallons used per day,	Gallons used per day		
	January & February	August & September		
2002	199	956		
2003	187	1061		
2004	214	927		
2005	178	818		
2006	206	929		
2007	176	979		
2008	170	855		
2009	186	861		
2010	170	758		
2011	177	728		
2012	146	826		

The following table shows the daily usage of single family residences during the winter and summer periods:

The following graph shows the growth in the City of Spokane and the total amount of water annually pumped by the City of Spokane Water and Hydroelectric Department. The actual population served is greater.



The following table shows the annual total gallons delivered to our wholesale customers:

	Annual Total	Percent
	Intertie Demand, gal.	Change
2005	161,179,040	
2006	190,312,144	18.1 %
2007	227,270,824	19.4 %
2008	75,063,296	- 67.0 %
2009	95,439,564	27.1 %
2010	108,846,716	14.0 %
2011	165,106,788	51.7%
2012	231,569,580	40.3%

7 CITY OF SPOKANE - ENVIRONMENTAL PROGRAMS 2nd Floor City Hall; 808 W. Spokane Falls Blvd.; Spokane, WA 99201-3334; (509) 625-6570; FAX (509) 343-5760 The following graph displays the total gallons per month wholesaled to water purveyors outside the City's water service area:



Total Intertie Water Demand, gallons per month

WATER YEAR	2012 pumpage (x1,000 gallons)				
Deriod	Total	Intertie Demand	Adjusted	Goal	Adjusted
Fellod			Total		Result
October 2011 through March 2012 (winter)	6,910,801	32,439	6,878,362	6,970,000	-1.3%
April through June (spring)	5,184,473	61,936	5,122,291	6,930,000	-26.1%
July through September (summer)	9,164,570	140,621	9,023,948	8,670,000	4.1%
Sum of seasonal totals	21,259,598				

If wholesale water use were not counted in the conservation goal we would be 1.6% closer to achieving the summer goal.

2012 Water Use Efficiency Program Summary

Due in great part to the mayoral change, 2012 was a transitional year for the Water Use Efficiency Program. There was a very limited program as funding became a concern which resulted in a lapse in maintaining the 2011 *Slow the Flow* educational campaign and activities. The Water Department staff member who oversaw the program moved on to another position within the City and program ownership was not re-established.

Additionally, 2012 was a recovery year – recovery from a clear message from City residents and businesses that the rates adopted by the City Council and implemented in 2011 were unacceptable. City leadership change resulted in a revision of those steeper rates, which was a very visible, impactful and welcome change while keeping a rate structure that still encourages conservation.

Residents continued to receive limited messaging in City documents and on the Environmental Programs website, and all required reporting was accomplished. For further information, check these three websites: <u>EPA-WaterSense Program</u> (www.epa.gov/watersense/) <u>H2OUSE-Watersaver Home</u> (www.h2ouse.net/) and the City of Spokane Water Stewardship Program at <u>www.waterstewardship.org/</u>

Looking Forward – 6-year Water Use Efficiency Program Goals (2013-2018)

Over the past six years the City – while seeing an overall downward trend in water usage – did not meet its summer water use reduction goal. As a result, proposed goals focus more directly on outdoor water use. Because outdoor water use is the largest use category in the City, there is greater opportunity for usage reduction. 60% of the outdoor use is residential use and more than 11% percent is government use. Addressing outdoor water use should prove to be a cost effective and attainable target for conservation measures. Therefore, the two primary goals will focus on (1) Spokane Summer Residential Outdoor usage and (2) Summer Government Outdoor usage. Usage reduction at parks, municipal golf courses, and schools are anticipated. Goal details and the specific measures to achieve them are currently being developed. What was once called the Water Stewardship Program will now be recognized as the Water Use Efficiency Program.

DISTRIBUTION SYSTEM LEAKAGE (DSL)

The Water Use Efficiency Rule requires the calculation of system water loss (leakage). Prior to this calculation, water systems are required to install service meters on all direct service connections¹ before January 22, 2017. The City of Spokane has had a long-standing policy of metering service connections. The calculations determine the volume of water not attributed to delivery to a customer and thus assumed to be lost to the ground. This loss is to be reported as a volume and as a percentage. In both cases, the DSL is determined as a running three-year average, and the water system must relate this DSL to the DSL standard promulgated by Washington Department of Health. The water use category of Non-Revenue Accounted-For Water is included in the Total Authorized Consumption (AC). This category, which is estimated (non-metered), includes such uses as street cleaning, cleaning water tanks/reservoirs, and water system maintenance (flushing). This estimate was reassessed in 2012.

The method for DSL calculation and the data for the calculation are in Appendix I, pg. 21. The volume and percent DSL for the last three years are as follows:

	2010	2011	2012	Average
DSL, percent	18.1%	20.1%	19.9%	19.4 %
DSL, volume (gallons x 1000)	3,739,318	4,165,694	4,190,911	4,031,974

The most direct means to comply with the Water Use Efficiency Rule standard for DSL is for the three-year running average to be less than $10\%^2$. The DSL for the City of Spokane Water System is 19.4%, which does not meet the standard. The City will continue to encourage the responsible use of our water resources, continue to assess the accuracy of our reporting, and implement projects to reduce our system leakage. Following is a graph depicting the annual DSL for 2002-2012:



¹ WAC 246-290-820(2)(a)

² WAC 246-290-820(1)(b)(i)



Quality Drinking Water An Invaluable Community Resource

INORGANICS

The City typically has a Washington State Department of Ecology certified laboratory run a full drinking water inorganics analysis once every three years on each of our source wells. In addition, nitrates are tested annually, as required.

The most recent inorganic results from certified laboratories are in Appendix IV. All sources are in compliance with existing National Primary Drinking Water Regulations for Inorganic Maximum Contaminant Levels (MCL).

ARSENIC

The arsenic readings in 2012 at the Nevada, Parkwater and Ray Street wells were 2.88 μ g/L, 3.26 μ g/L and 4.58 μ g/L respectively. The MCL for arsenic is 10 μ g/L, or parts per billion (ppb). For City drinking water, 5.13 μ g/L of Arsenic in 2009 from Ray Street Well represents the highest result to date. A 2007 result from Well Electric (4.92 μ g/L) was the previous high.

City drinking water currently meets EPA's drinking water standard for arsenic. However, it does contain low levels of arsenic. There is a small chance that some people who drink water containing low levels of arsenic for many years could develop circulatory disease, cancer, or other health problems. Most types of cancer and circulatory diseases are due to factors other than exposure to arsenic. EPA's standard balances the current understanding of arsenic's health effects against the cost of removing arsenic from drinking water.

Further information concerning health impact issues, regulatory requirements, and compliance costs for water utilities/water customers can be found at <u>water.epa.gov/drink/contaminants/basicinformation/arsenic.cfm</u> and <u>www.doh.wa.gov/Portals/1/Documents/Pubs/331-167.pdf</u>.

LEAD - COPPER

Lead and copper testing of sources and at-risk residences were conducted in 2012. The highest reading of lead in a home was 15.0 ppb. The maximum reading for copper was 190 ppb. The 90th percentile for lead was 3.8 ppb. The 90th percentile for copper was 91.7 ppb. These 90th percentile results for lead and copper continue to be substantially less than the 15 ppb Action Level for lead and the 1300 ppb Action Level for copper. Federal regulations require that 90% of the tested homes be below these levels. The federal government has a 0 ppb Maximum Contaminant Level Goal (MCLG) for lead and a 1300 ppb MCLG for copper. The lead results, based on City in-home sampling, also continue to qualify our water system as having "Optimized Corrosion Control." Source water is analyzed for lead and copper concurrent with the in-home testing. The maximum concentration in 2012 source water testing for lead was 0.35 ppb and for copper was 8.29 ppb.

"At risk" homes were determined before testing. Homes with lead soldered copper plumbing and/or those with lead alloy service lines running from the street to the home are considered at risk. City records indicate that some 981 homes built during World War II were connected to the City's distribution system with lead alloy pipes. In addition, before lead solder was banned in 1988, it was commonly used to connect copper piping in homes. The Spokane Water Dept., in 2000, notified the then current owners of homes with water service lines made of lead alloy and extended an offer to

replace the lead pipe, if the homeowner would pay the replacement cost from the property line into the house. 156 homeowners requested their water service line be replaced. The City has completed work at all 156 sites, replacing the service pipe up to the property line. It was not anticipated, but no lead pipe was found on any homeowner's side of the water service. Additionally, the Water Dept. has been replacing the City lead-alloy services when in-home testing results exceeded Action Limits and when water line work was already being conducted. Currently, 572 lead alloy connections remain in service.

Testing on water left sitting in lead-containing pipes for at least 6 hours clearly demonstrates the fact that some lead moves into the water. We encourage anyone with this kind of plumbing to let water run from the tap until cold before filling their container for drinking or cooking, especially if the water is to be given to infants or children. For further information concerning lead and copper in drinking water, you can access the Washington Dept. of Health website at www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/Contaminants/Lead.aspx and www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/Contaminants/Copper.aspx.

NITRATE-NITROGEN

The Ray Street Well continues to be monitored quarterly for Nitrate-N. **In 2012, the highest certified lab quarterly result for the Ray Street Well was 3.68 mg/L.** The federal MCL for Nitrate –N is 10 mg/L. The result from a duplicate sample analyzed by the Riverside Park Water Reclamation Facility (RPWRF) Laboratory was 3.74 mg/L. The quarterly results for Ray Street Well for 2012 are as follows:

Sample Date	Certified Laboratory Result - Nitrate-N, mg/L	RPWRF Laboratory Result – Nitrate+Nitrite-N, mg/L
31-January-2012	3.08	3.30
24-April-2012	3.15	3.76
31-July-2012	2.51	2.95
30-October-2012	3.68	3.74

The trend for nitrate-nitrogen at the Ray Street Well has remained constant to slightly declining for a number of years.

All other City sources average 1.25 mg/L for 2012, less than a fifth of the MCL for nitrate-nitrogen. The 2012 results for the other City source wells are as follows:

Source Well	Certified Laboratory Result - Nitrate-N, mg/L	RPWRF Laboratory Result – Nitrate+Nitrite-N, mg/L
Well Electric	1.49	1.69
Parkwater	1.35	1.51
Hoffman	2.20	1.65
Grace	0.76	0.85
Nevada	0.80	0.86
Central	0.92	0.99

The following map depicts the results of monitoring wells sampled during 2012 by the Spokane County Water Resources Program. The results are for nitrate+nitrite as nitrogen from monitoring wells and springs along the Spokane River and purveyor wells over the Spokane Aquifer. Where multiple sampling events occurred at the same location, the highest result is depicted on the map. There are a number of wells that had results between 2.5 and 4 mg/L. These wells, including the City of Spokane Ray Street Well, are typically located along the edge of the aquifer, and appear to be subject to nitrate loading to the aquifer that originates at higher elevations.



For further information concerning nitrate in drinking water and potential health issues, you can access the EPA website at <u>water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm</u> or the Washington State Dept. of Health website at <u>www.doh.wa.gov/Portals/1/Documents/Pubs/331-214.pdf</u>.

(Para ver información adicional, visite al; www.doh.wa.gov/Portals/1/Documents/Pubs/331-214s.pdf)

PHOSPHORUS

Drinking water regulations primarily deal with human health-related impacts. Phosphorus is not a drinking water regulated contaminant, but is of significant concern in this region as a pollutant of concern in the Spokane River. Local groundwater makes significant contribution to the River and is the background for water discharged to sewer.

During 2012, the Spokane County Water Resources Program collected and analyzed 136 samples from 48 locations for Total Phosphorus (including duplicate samples at several locations). Of that number, 32 samples from 15 different

locations exceeded 0.010 mg/L. Following is a map demonstrating the distribution of Total Phosphorus results on the Washington side of the Spokane Valley-Rathdrum Prairie Aquifer;



This map illustrates that, similar to nitrate concentrations in groundwater, phosphorus concentrations are greatest along the sides of the valley. This likely indicates loading from run-off from higher elevations. There are a couple of sampling sites with higher values that appear to <u>not</u> be located near the sides of the valley or near the Spokane River. These sampling sites have Total Phosphorus concentrations in the range of 0.011 to 0.024 mg/L.

In July 2012, groundwater samples from the City source wells were analyzed by the City RPWRF Laboratory. Similar to nitrate concentrations, most City wells have fairly low concentrations. The average concentration of the six city wells not including the Ray Street Well was 0.004mg/L. Ray Street Well was sampled four quarters, and the greatest result was .028mg/L. There is no drinking water regulatory limit for phosphorus, but to give this some context, the Total Maximum Daily Loading for Dissolved Oxygen for the Spokane River calls for a phosphorus concentration limit of 0.010 mg/L in the river during the critical summer season.

					PO4-P, mg/L
Location	Date Sampled	PO4-P, mg/L *	Location	Date Sampled	*
Electric	7/31/2012	0.0044	Central	7/31/2012	0.0032
Parkwater	7/31/2012	0.0030	Ray Street	1/31/2012	0.028
Nevada	7/31/2012	0.0039	Ray Street	4/24/2012	0.017
Grace	7/31/2012	0.0037	Ray Street	7/31/2012	0.024
Hoffman	7/31/2012	0.0031	Ray Street	10/30/2012	0.025

RADIONUCLIDES & RADON

RADIONUCLIDES

In 2012, the City of Spokane tested the Grace and Well Electric source wells for Radium 228 and Gross Alpha. The Parkwater well was tested for Radium 226 and Radium 228. The table below has the results.

	Gross Alpha Particle Activity	Radium 228	Radium 226	Combined Radium 226/228 *
Grace	< 1.0	0.57	N/A	.5
Parkwater	N/A	0.68	0.23	0
Well Electric	2.3	0.25	N/A	2.3

All results in pCi/L

Gross Alpha Particle Activity has an MCL of 15 pCi/L. The federal MCL for Radium 226 and Radium 228 (combined) is 5 pCi/L. The City of Spokane results were below the MCL.

The Radionuclide Rule allows Gross Alpha results to be used in lieu of Radium 226 if the Gross Alpha particle activity is below 5 pCi/L. If the gross alpha particle activity result is below the detection limit, as occurred in the Grace sample, one-half of the detection limit is used to determine compliance³.

* If the Radium 228 or 226 value is < 1.0 a value of zero will be used to calculate the Combined Radium $226/228^4$.

For more information on radionuclides in drinking water, access the EPA website at water.epa.gov/lawsregs/rulesregs/sdwa/radionuclides/index.cfm

RADON

The Water Dept. monitored the Grace and Well Electric wells in 2012, with results of 262 pCi/L and 381 pCi/l respectively. The Environmental Protection Agency has published a proposed rule for regulating the concentration of radon-222 in drinking water. The rule proposes a maximum contaminant level goal (MCLG) of zero, a maximum contaminant level (MCL) of 300 pCi/L, and an alternative maximum contaminant level (AMCL) of 4000 pCi/L. The proposed rule would require that community water supply systems (including the City's) generally would have to comply with the MCL of 300 pCi/L, unless there is a multi-media mitigation program (MMM) in place. With a MMM, the AMCL of 4000 pCi/L would apply.

The publication of the proposed rule was November 2, 1999, and the comment period closed February 4, 2000. The final rule was expected to be published one year from that date. The rule had been listed on the Unified Agenda of Federal Regulatory and Deregulatory Actions with the status of the radon regulation final action "To Be Determined." In the January 2012 update of the Unified Agenda, the rule was removed.

Radon gas is one of a number of radioactive elements that result from the radioactive decay of uranium found locally in natural deposits. Exposure to excessive amounts of radon may increase cancer risk. Most of these risks result from exposure to radon in indoor air. The EPA has determined that 1-2% of the radon in indoor air comes from drinking water. For further information concerning radon in drinking water, access the EPA website at www.epa.gov/radon/rnwater.html. For more general information concerning radon in the environment and the associated health issues, access the EPA website at www.epa.gov/radon/rnwater.html. For more general information concerning radon in the environment and the associated health issues, access the EPA website at www.epa.gov/radon/index.html. or call the Radon Hotline at *1-800-SOS-RADON [1-800-767-7236]*. An EPA publication titled "A Citizen's Guide to Radon" can be downloaded from www.epa.gov/radon/pubs/citguide.html.

³ 40 CFR 141.26a (5)

⁴ 40 CFR 141.26c (3) v

ORGANICS

DISINFECTION BY-PRODUCTS - DISTRIBUTION SYSTEM

The maximum value during 2012 compliance monitoring of the distribution system for Total Trihalomethanes (TTHM) was 5.35 ppb and for Haloacetic Acids (HAA5) was no detection. This is well below the Federal MCL of 80 ppb for total Trihalomethanes and 60 ppb for the sum of five Haloacetic acids and is only detected at the extreme end of the distribution system. The Stage 2 Disinfectants and Disinfection By-products Rule requires that a Locational Running Annual Average (LRAA) is used for reporting compliance. This is the average of the four quarterly samples for each sampling location. The maximum LRAA for TTHM is 3.98 ppb. Appendix IV has the results for all 2012 quarterly sampling. There were no detections of Haloacetic Acids at any sampling site in 2012. The City uses small amounts of chlorine as a drinking water disinfectant. However, the disinfectants themselves can react with naturally-occurring materials in the water to form byproducts, which may pose health risks.



In 2012 BPA, Eagle Ridge II, Mallen and Southview were sampled each quarter. Cedar Hills and Strong Road were sampled in the spring and winter. Midbank and Cedar Springs were sampled in the summer and fall. For more information on the Stage 2 DBPR, go to the EPA website water.epa.gov/lawsregs/rulesregs/ sdwa/stage2/index.cfm

2012 was the first year of sampling under the Stage 2 Disinfectants and Disinfection Byproducts Rule. Starting in 2007 and continuing until 2010, the City Water Department performed assessment monitoring at over 20 locations (approximately five each year) to determine the potential for disinfection by-products (DBP) to be formed during the detention period in the distribution system. The DBP assessment sampling sites were selected from the existing Coliform sampling sites. Based on this sampling and analysis of the retention time of water in the distribution system, locations were determined for the Stage 2 distribution system sampling program.

MtBE (Methyl tert-Butyl Ether)

Parkwater, Ray Street and Well Electric well stations were monitored for MtBE in 2012 in conjunction with the regularly scheduled Volatile Organic Compounds (VOC) monitoring. There were no detections at a detection limit of 0.5 μg/L. The City has included testing for MtBE with the VOC monitoring since 2005 and has had no detections.

There is currently a drinking water advisory for MtBE <u>water.epa.gov/action/advisories/drinking/mtbe.cfm</u>. This advisory recommends a range of 40 μ g/L or less based on consumer acceptance of potential taste and odor. The EPA believes this would also provide a large margin of exposure (safety) from toxic effects.

Further information concerning the health impact, environmental effects, and technical background of MtBE can be found at the following website: the EPA Office of Water at www.epa.gov/mtbe/water.htm

OTHER VOLATILE ORGANICS

Refer to Appendix VI in the 2010 Drinking Water Report for a historic summary of ORGANIC CHEMICAL DETECTIONS for each well station that contributes to the City Water System. Only organic compounds that have previously been detected in City water are listed. Many compounds have been tested for and not detected - see Appendix II: "TESTS RUN ON CITY OF SPOKANE WATER" in the 2010 Drinking Water Report for a comprehensive list.

In 2012, the City of Spokane tested the Parkwater, Ray Street and Well Electric well stations for Volatile Organic Compounds (VOC). There were no detections.

Trihalomethanes (THMs, chloroform, bromoform, bromodichloromethane, dibromochloromethane) are one group of volatile organic, disinfection by-products. That is to say, they can originate from chemical interactions between a disinfectant (chlorine gas in the City's system) and any organic matter present in the raw water. There were no detections of THMs in source water monitoring for 2012.

SYNTHETIC ORGANICS

In 2012, the City of Spokane sampled Nevada, Parkwater, Ray Street and Well Electric well stations (twice each) for Synthetic Organic Chemicals (SOC). There were no detections. The City conducts tests for more than 140 different chemicals including pesticides, herbicides, PCBs, and phthalates (plasticizers).

MICROBIOLOGICAL CONTAMINANTS

COLIFORM BACTERIA - SOURCE

The City of Spokane well station raw source water (the water before disinfectant chlorination) has been tested regularly for coliform bacteria. While historically there has been no requirement to test for coliform bacteria in source water, the City of Spokane has monitored for this water quality parameter. More recently, testing requirements to determine whether hydraulic continuity exists with the Spokane River have increased the testing frequency. In 2012, out of 96 tests for coliform bacteria in the City Source Water Wells, there were no detections of total coliform and no detections of fecal coliform.

Out of 406 tests over the five-year period from 2008 through 2012, there have been no detections of total coliform or fecal coliform in the source water.

HETEROTROPHIC PLATE COUNT BACTERIA - SOURCE

In 2012, out of 67 Heterotrophic Plate Count (HPC) tests on source water, there were 22 positive results. The greatest concentration was 203 colonies per milliliter of sample at the Hoffman Well. HPC tests were conducted 374 times over the five-year period from 2008 through 2012 on raw source water. There have been 128 positive HPC results. Washington State Drinking Water regulations state *"Water in a distribution system with a HPC level less than or equal to 500/mL is considered to have a detectable residual disinfectant concentration"*⁵. The maximum detection during this five-year period was 806 colonies per milliliter at the Hoffman Well in 2011. Without regard to source water HPC levels, City source water is treated with chlorine to safeguard drinking water quality. This is done based on the historical use of open reservoirs (which no longer exist) and to preserve the sanitary quality when a well or piping is open to the environment during construction, repair or routine maintenance. Some water utilities in this area (drawing from the same aquifer) do not add any disinfectant.

COLIFORM BACTERIA - DISTRIBUTION SYSTEM

Coliform testing is typically being done four days a week from various points in the distribution system. The Water Department has greater than 220,000 customers. This population tier⁶ requires taking 150 samples per month, which was adopted as the target for distribution system coliform monitoring by the Water Dept. in 2007. When a coliform positive test result is reported, re-sampling is done. **During 2012, the City Water Department had 1,974 coliform bacteria samples analyzed. On July 2, 2012, there was one positive total coliform bacteria result in the distribution system.** Five additional samples (re-sampling of the site, plus one sample each immediately up and down "stream" from the site and 2 source samples) were collected to confirm or deny this result. **These samples were negative for total coliform and the initial result was not confirmed.** The Maximum Contaminant Level is that no more than 5% of the total coliform bacteria tests can be positive per month. In 2012, the greatest number of positive results in one month was 1 in 168 samples. This is 0.6 % of the results, well below the MCL. 1,983 samples were analyzed in 2011 and 2,010 samples were analyzed in 2010.

The Water Department staff has worked to refine the sampling sites for the distribution system. Concerns about inadvertent contamination of sampling sites and locations that don't adequately represent the distribution of the water system has caused the Water Department staff to establish more dedicated sampling sites at locations more representative of the entire system. Following is a map of the distribution system sampling sites during 2012, overlaid on the water service area. It is important to note that the sample sites are evenly placed based on the distribution system, which may not currently reach all parts of the water service area, and population density.

⁶ ref. WAC 246-290-300 (3)(e-Table 2)

⁵ Ref. WAC 246-290-451 (3)(c)



Water Department staff state that coliform bacteria have not been confirmed in the distribution system for at least the last 30 years. Sample handling or collection errors are suspected causes of the original detections.

PROTOZOA

A number of cities and towns throughout the country in years past have experienced problems with giardia and/or cryptosporidium getting into the distribution systems. Most times, problems with these parasitic organisms in potable water have been associated with surface water sources. The City is not aware of, nor has the State Department of Health or Spokane Regional Health District indicated an awareness of, cases where infections with these organisms were traced back to the City's water system.

Please note that cryptosporidium and other water borne organisms can also spread many ways, for further risk information go to the Centers for Disease Control and Prevention (CDC) at <u>www.cdc.gov/parasites/crypto/gen_info/infect.html</u>. People who become ill as a result of consuming giardia and/or cryptosporidium typically recover after suffering severe bouts of diarrhea. However, small children, people whose immune systems are compromised, or are otherwise in poor health, can die as a result of these infections. For further information concerning the potential health effects issues, access the websites at the CDC at <u>www.cdc.gov/parasites/crypto/index.html</u> (cryptosporidium) and <u>www.cdc.gov/parasites/giardia/index.html</u> (giardia) and the EPA website at <u>www.epa.gov/safewater/consumer/pdf/crypto.pdf</u> (Para ver información adicional, visite <u>water.epa.gov/drink/agua/upload/crypto_spanish.pdf</u>)

English:

This report contains important information about the drinking water supplied by the City of Spokane. Translate it, or speak with someone who understands it well.

Spanish:

Este reporte contiene información importante acerca del agua potable suministrada por la Ciudad de Spokane. Tradúzcalo, o hable con alguien que lo entiende bien. (Para ver información adicional, visite al;

www.epa.gov/espanol/ciudadanos.html)

Russian:

В этом отчете содержится важная информация относительно питьевой воды, поставляемой службой города Спокэн. Переведите этот отчет или поговорите с тем, кто его хорошо понимает.

Vietnamese:

Bản phúc trình này chứa đựng những thông tin quan trọng về nước uống được cung cấp bởi City of Spokane. Hãy phiên dịch, hay hỏi thăm người nào hiểu rõ về tài liệu này.

GENERAL INFORMATION

Across the nation, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material and can pick up substances resulting from the presence of animals or human activity.

Contaminants that may be present in source water include:

• Biological contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

• Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm run-off, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

• Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm water run-off, and residential uses.

• Organic chemicals, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water run-off and septic systems.

• Radioactive materials, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food & Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protections for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by contacting the Environmental Protection Agency's Safe Drinking Water Hotline at (800) 426-4791, or you can access additional information at EPA websites: <u>water.epa.gov/drink/index.cfm</u> or <u>water.epa.gov/drink/info/index.cfm</u>

HEALTH INFORMATION

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Additional information concerning:

<u>Radon:</u> During 2012, the City conducted tests from two source wells for Radon-222. The results were 262 pCi/L and 381 pCi/L. The EPA has proposed a MCL of 300 pCi/L which has not been finalized.

Radon is a radioactive gas that you can't see, taste, or smell and is a known carcinogen. Compared to radon entering the home through soil, radon entering the home through tap water will, in most cases, be a small source of radon in indoor air. Breathing air containing radon can lead to lung cancer and/or drinking water containing radon also may cause increased risk of stomach cancer. If

you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. Fix your home if the level of radon in your air is 4 picocuries per liter of air (pCi/L) or higher. There are simple ways to fix a radon problem that aren't too costly. For additional information, call EPA's Radon Hotline (800-SOS-RADON) or access the EPA website at www.epa.gov/radon/hotlines.html.

<u>Arsenic:</u> The arsenic readings in 2012 at the Nevada, Parkwater and Ray Street wells were 2.88 ppb, 3.26 ppb and 4.58 ppb respectively. The Maximum Contaminant Level (MCL) for Arsenic is 10 ppb.

City of Spokane drinking water currently meets EPA's revised drinking water standard for arsenic. However, it does contain low levels of arsenic. There is a small chance that some people who drink water containing low levels of arsenic for many years could develop circulatory disease, cancer, or other health problems. Most types of cancer and circulatory diseases are due to factors other than exposure to arsenic. EPA's standard balances the current understanding of arsenic's health effects against the cost of removing arsenic from drinking water. Information on arsenic in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <u>water.epa.gov/lawsregs/rulesregs/sdwa/arsenic/index.cfm</u>.

<u>Lead:</u> During 2012, the City tested 54 at-risk residences for lead. The single highest result was 15 ppb. This result for lead is equal to the 15 ppb Action Level for lead. The lead results, based on City in-home sampling, also continue to qualify our water system as having "Optimized Corrosion Control." Source water is also analyzed for lead concurrent with the in-home testing. The maximum concentration in 2012 source water testing for lead was 0.35 ppb.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Spokane is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your drinking water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline, 1-800-426-4791 or at water.epa.gov/drink/info/lead/index.cfm

CITY OF SPOKANE'S SYSTEM

All of the City of Spokane's drinking water comes from the Spokane Valley-Rathdrum Prairie (SVRP) Aquifer - designated a "sole source" aquifer in 1978. The Spokane Aquifer (that portion of the SVRP aquifer lying within Washington State) and the Spokane River exchange water. The rates and locations of exchange are the subject of continued study.

Due to the porous nature of the ground surface and the number of potential contaminant sources, the possibility of contaminating the aquifer exists if good "housekeeping" measures are not followed for all activity over and adjacent to the aquifer. In order to safeguard water quality, the City, in coordination with other stakeholders, is currently implementing a Wellhead Protection Program. This Program endeavors to inform the public about the Spokane Valley-Rathdrum Prairie Aquifer, and about appropriate disposal mechanisms for dangerous and/or critical materials that are generated in the Aquifer Sensitive Area. The program seeks land use regulations to help protect drinking water wells from contamination.

For additional information regarding the City of Spokane's Drinking Water or related issues, you can call:

City of Spokane Water & Hydroelectric Services	509-625-7800
City of Spokane Environmental Programs	509-625-6570

The Mayor recommends Water and Hydroelectric Services policy and rates to the Spokane City Council. The Council meets most Mondays at 6:00 p.m. in the Council Chambers at Spokane City Hall (808 W. Spokane Falls Blvd., Spokane, WA).

Appendix I - Water Use Efficiency compliance data

7-Mar-2013

Distribution System Leakage (DSL)

	2012	2011	2010	2009	2008	2007	2006	2005	2004
Service Meter Reading-Single Family, gallons	8,340,082,788	8,004,190,202	8,317,983,390	9,649,430,384	8,624,299,376	8,992,947,286	8,998,900,409	8,130,224,432	8,923,907,784
Service Meter Reading-Multi Family, gallons	2,209,050,964	2,123,911,196	2,156,077,200	2,360,823,156	3,065,246,404	3,534,713,255	3,449,781,864	3,153,482,728	3,082,925,384
Service Meter Reading-Commercial/Industrial, gallons	3,810,799,262	3,712,856,606	3,896,950,147	4,217,716,655	5,565,693,716	6,218,000,969	6,260,652,288	5,963,093,400	6,676,204,436
Service Meter Reading-Government, gallons	1,450,574,304	1,340,906,695	1,325,244,765	1,643,114,508	1,587,638,976	2,061,287,117	2,059,728,405	2,005,159,112	2,020,674,128
Purchased, permit ***	5,349,696								
Emergency Interties, gallons	**	**	* *	* *	* *	* *	* *	221,408	175,711,932
Wholesale Amount Sold, gallons	231,569,580	165,106,788	108,846,716	95,993,084	75,146,324	222,581,612	159,655,364	98,042,604	70,638,128
Non-Revenue Accounted for Water, gallons (estimate) *	784,644,731	1,189,855,000	1,064,380,000	1,064,380,000	209,440,000	209,440,000	209,440,000	209,440,000	209,440,000
Total Authorized Consumption, gallons *	16,832,071,326	16,536,826,487	16,869,482,218	19,031,457,788	19,127,464,796	21,238,970,240	21,138,158,330	19,559,663,684	21,159,501,792
Total Authorized Consumption (cal. \mathbf{X} 1000) (AC) *	16 922 071	16 526 926	16 960 492	10 021 459	10 127 465	21 228 070	21 129 159	10 550 664	21 150 502
Total Authorized Consumption (gal. A1000) (AC)	10,852,071	10,550,820	10,009,402	19,031,438	19,127,405	21,238,970	21,130,130	19,559,004	21,139,302
Total Production (gal. ¥1000) (TP)	21 022 982	20 702 520	20 608 800	22 402 716	21 222 058	23 066 258	23 735 049	20 855 394	21 615 890
	21,022,902	20,702,320	20,000,000	22,702,710	21,222,038	25,000,250	25,755,049	20,055,594	21,015,090
Distribution System Leakage (DSL), volume (gal. X1000)	4,190,911	4,165,694	3,739,318	3.371.258	2.094.593	1.827.288	2,596,891	1,295,730	456.388
Distribution System Leakage (DSL), percent	19.9%	20.1%	18.1%	15.0%	9.9%	7.9%	10.9%	6.2%	2.1%

* Total Authorized Consumption includes Non-Revenue Accounted for Water, which is consistent with Water Use Efficiency Rule guidance (see definition at right). This is different from past practice in previous Water System Plans. The value for Non-Revenue Accounted for Water (estimated, nonmetered) was reassessed in 2009 and again in 2012

WAC 246-290-010 Definitions. - "Authorized consumption" means the volume of metered and unmetered water used for municipal water supply purposes by consumers, the purveyor, and others authorized to do so by the purveyor, including, but not limited to, fire fighting and training, flushing of mains and sewers, street cleaning, and watering of parks and landscapes. These volumes may be billed or unbilled.

* * Emergency intertie volumes are combined with Wholesale Amount sold *** Prior to 2012 this was included in Non-Revenue Accounted for Water

Method for calculating the Distribution System Leakage (DSL)

Calculating Percent DSL To calculate percent DSL, use the following equation:

Percent DSL = $[(TP - AC) / (TP)] \times 100$ Where: DSL = Percent (%) of distribution system leakage TP = Total water produced and purchased AC = Authorized consumption

Calculating Volume DSL To calculate volume DSL, use the following equation:

Volume DSL = TP - ACReport volume DSL in millions of gallons or gallons

Total System Pumpage vs. Water Stewardship Strategic Plan Goals (source - City of Spokane Water Department)

Total System T ampage 13: Water Stewardship Strategie Tha		ity of Sponane tra	iter Department)						
WATER YEAR (Oct. through Sept.)	2012	2011	2010	2009	2008	2007	2006	2005	2004
				pumpage (x1	1,000 gallons)	•	•		
Total - Oct. (prev. yr.)through Mar.	6,910,801	6,475,952	6,778,277	6,618,666	6,670,191	7,161,742	6,884,687	6,305,328	6,743,044
Total - Apr. through Jun.	5,184,227	4,655,473	5,241,226	6,439,647	5,340,540	6,463,462	5,991,545	5,105,476	6,347,928
Total - Jul. through Sept.	9,164,570	9,329,077	8,938,048	9,202,243	9,277,452	9,936,735	10,451,223	9,695,077	8,737,566
Total - sum of seasonal totals	21,259,598	20,460,502	20,957,551	22,170,556	21,288,183	23,561,939	23,327,455	21,105,881	21,828,538
Goal - Oct. (prev. yr.) through Mar.	6,970,000	6,920,000	6,870,000	6,810,000	6,760,000	6,710,000	6,660,000		
Goal - Apr. through Jun.	6,930,000	6,920,000	6,900,000	6,890,000	6,870,000	6,850,000	6,830,000		
Goal - Jul. through Sept.	8,670,000	8,750,000	8,830,000	8,910,000	8,990,000	9,060,000	9,130,000		
Difference between Cool & Use of a nerrounter (neritive									
Difference between Goal & Use as a percentage (positive									
value equal exceedance of goal)									
Result - Oct. (prev. yr.) through Mar.	-0.8%	-6.4%	-1.3%	-2.8%	-1.3%	6.7%	3.4%		
Result - Apr. through Jun.	-25.2%	-32.7%	-24.0%	-7.8%	-22.3%	-5.6%	-12.3%		
Result - Jul. through Sept.	5.7%	6.6%	1.2%	3.3%	3.2%	9.7%	14.5%		

Single Family Residences, total volume billed (entire service area	a) (Source - Utility	Billing)			
year	billing period	gallons (total)	no. of service locations	gal per service location per day	% change of service locations (Aug. & Sept.)
2002	Jan. & Feb.	661,658,308	57,239	199	
2002	Aug. & Sept.	3,349,808,500	58,418	956	
2003	Jan. & Feb.	621,954,490	57,238	187	
2003	Aug. & Sept.	3,739,564,671	58,747	1061	0.56%
2004	Jan. & Feb.	718,183,965	57,978	214	
2004	Aug. & Sept.	3,297,148,096	59,259	927	0.87%
2005	Jan. & Feb.	604,612,888	58,403	178	
2005	Aug. & Sept.	2,940,177,049	59,914	818	1.11%
2006	Jan. & Feb.	709,090,289	59,231	206	
2006	Aug. & Sept.	3,392,957,337	60,883	929	1.62%
2007	Jan. & Feb.	610,421,856	59,881	176	
2007	Aug. & Sept.	3,610,435,980	61,459	979	0.95%
2008 *	Jan. & Feb.	605,478,234	60,435	170	
2008	Aug. & Sept.	3,158,038,235	61,581	855	0.20%
2009	Jan. & Feb.	655,566,618	60,683	186	
2009	Aug. & Sept.	3,183,286,496	61,585	861	0.01%
2010	Jan. & Feb.	597,449,771	60,608	170	
2010	Aug. & Sept.	2,809,319,289	61,810	758	0.37%
2011	Jan. & Feb.	622,672,473	60,492	177	
2011	Aug. & Sept.	2,693,465,720	61,671	728	-0.22%
2012	Jan. & Feb.	520,332,871	60,478	146	
2012	Aug. & Sept.	3,064,418,368	61,822	826	0.24%
	~ .		Avg percent cl	nange of service	0.57%

Appendix II - Annual Testing Summary - Tests Run	on City of Spokane W	ater				22-Feb-2013		
2012 DRINKING WATER SOURCE	E - COMPLET	ED QUARTE	RLY MONIT	ORING				
	COURCE #	0				2		
	SOURCE #	CENTRAL	6 CRACE	5 HOEEMAN	I NEVADA	3 DADKWATED	4 DAV	2 WELL ELECTRIC
BACTERIA	WELL	CENTRAL	GRACE	HOFFMAN	NEVADA	PAKKWATEK	KAI	WELL ELECTRIC
COLIFORM - RAW SOURCE *								
Total Coliform -number of samples per year / greatest result		6 / <1	7 / <1	4 / <1	7 / <1	11/<1	10 / <1	51 / <1
Fecal Coliform - number of samples per year / greatest result		6 / <1	7 / <1	4 / <1	7 / <1	11/<1	10 / <1	51 / <1
HETEROTROPHIC PLATE COUNT - RAW SOURCE *		6/<1	7/<1	4 / 203	7/2	11/18	10 / 107	22 / 84
number of samples per year / greatest result value	e							
* All operating wells are typically sampled once per month								
INORGANIC								
FULL LIST- CERTIFIED LAB (phase II & V included)	3rd Qtr - Jul				completed-see App. III	completed-see App. III	completed-see App. III	
NITRATE	1st Otr - Ian						3.08	
	2nd Otr - April						3.15	
	3rd Otr - Jul	0.92	0.76	2.2	0.80	1.35	2.51	1.49
	4th Qtr - Oct						3.68	
NITRATE + NITRITE - RPWRF LAB	1st Qtr - Jan						3.30	
	2nd Qtr - April						3.76	
	3rd Qtr - Jul	0.99	0.85	1.65	0.86	1.51	2.95	1.69
	4th Qtr - Oct						3.69	
OPGANIC								
ORGANIC								
VOLATILES	1st Otr - Ian					no detections	no detections	
(including TRIHALOMETHANES)	2nd Otr - April					no detections	no detections	
	3rd Otr - Jul							no detections
	4th Otr - Oct							no detections
SYNTHETIC ORGANICS (515.1, 525.2, 531.1)	2nd Qtr - April				no detections			
	3rd Qtr - Jul				no detections	no detections	no detections	no detections
	4th Qtr - Oct					no detections	no detections	no detections
RADIOACTIVE CONTAMINANTS								
Radium 228 - pCi/L, Gross Alpha - pCi/L	3rd Qtr - July		0.57, < 1.0			0.68		0.25, 2.3
Radium 226- pCi/L	3rd Qtr - July					0.23		
UNITS ARE AS REPORTED, ppb FOR ORGANICS, ppm FO	R INORGANICS, except w	here noted.						

Appendix III

21-Feb-2013

Maximum Contaminant CURRENT DATA SUMMARY

DRINKING WATER INORGANICS SUMMARY

MOST RECENT WELL STATION MONITORING ANALYTICAL RESULTS CERTIFIED LABORATORIES

CITY OF SPOKANE

								Levels	Goals				
WELL STATION	CENTRAL	ELECTRIC	GRACE	HOFFMAN	NEVADA	PARKWATER	RAY	MCL's**	MCLG's	MEAN	MAX	MIN	COUNT
SAMPLING DATE	27-Jul-2010	27-Jul-2010	26-Jul-2011	26-Jul-2011	31-Jul-2012	31-Jul-2012	31-Jul-2012						
LABORATORY	County (SVL)	County (SVL)	County (SVL)	County (SVL)	(Anatek)	(Anatek)	(Anatek)						
ALKALINITY	114	122	86.8	149	90	147	155	unregulated		123	155	86.8	7
HARDNESS (as CaCO3)	124	131	88.7	155	97	163	171	unregulated		133	171	88.7	7
CONDUCTIVITY (µmos/cm)	257	278	203	379	207	335	383	700 t		292	383	203	7
TURBIDITY (NTU)	< 0.100	< 0.100	0.899	2.48	< 0.100	< 0.100	< 0.100	1 t		0.48	2.48	0.899	7
COLOR (color units)	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	15 s		0.000	< 5.00	< 5.00	7
CHLORIDE	3.19	3.8	3.83	10.4	3.67	5.59	12.8	250 s		6.18	12.8	3.19	7
TOT. DISSOLVED SOLIDS	143	155	113	215	119	201	220	500 t		167	220	113	7
MAGNESIUM	14	13.6	7.79	18.1	8.74	17.6	16.3	unregulated		13.7	18.1	7.79	7
CALCIUM	26.7	30.2	22.7	32.3	23.9	35.9	49.4	unregulated		31.6	49.4	22.7	7
ORTHO-PHOSPHATE	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	unregulated		0.02	0.02	< 0.010	7
AMMONIA	< 0.030	< 0.030	< 0.030	< 0.030	< 0.05	< 0.05	< 0.05	unregulated			< 0.05	< 0.030	7
CYANIDE	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.01	< 0.01	< 0.01	0.2	0.2		< 0.0100	< 0.0100	7
FLUORIDE	< 0.100	< 0.100	< 0.100	< 0.100	< 0.1	< 0.1	< 0.1	2 s	4		< 0.100	< 0.100	7
NITRATE (NO3-N)	0.95	1.41	0.77	2.48	0.8	1.35	2.51	10	10	1.47	2.51	0.766	7
NITRITE (NO2-N)	< 0.050	< 0.050	< 0.050	< 0.050	< 0.1	< 0.1	< 0.1	1	1		< 0.1	< 0.050	7
SULPHATE	12	10.8	6.66	14.9	7.58	15.1	13.1	250 s	400	11.4	15.1	6.7	7
ALUMINUM	< 0.080	< 0.080	< 0.080	< 0.080	< 0.01	< 0.01	< 0.01	0.05 - 0.2 mg/L s			< 0.080	< 0.05	7
ANTIMONY	< 0.00300	< 0.00300	< 0.00300	< 0.00300	< 0.001	< 0.001	< 0.001	0.006	0.006		< 0.00300	< 0.001	7
ARSENIC	0.00324	0.00422	0.00260	0.0023	0.00288	0.00326	0.00458	0.010	0	0.0033	0.00458	0.0023	7
BARIUM	0.0249	0.0216	0.0165	0.0315	0.0168	0.0277	0.0472	2	2	0.0266	0.0472	0.0165	7
BERYLLIUM	< 0.000800	< 0.000800	< 0.000800	< 0.000800	< 0.0003	< 0.0003	< 0.0003	0.004	0.004		< 0.0008	< 0.0003	7
CADMIUM	< 0.00200	< 0.00200	< 0.00020	< 0.000200	< 0.001	< 0.001	< 0.001	0.005	0.005		< 0.001	< 0.000200	7
CHROMIUM	< 0.0060	< 0.0060	< 0.0060	< 0.0060	< 0.001	< 0.001	< 0.001	0.1	0.1		< 0.0060	< 0.001	7
COPPER	< 0.010	< 0.010	< 0.010	< 0.010	0.00298	0.00058	0.000481	TT	1.3		< 0.010	< 0.010	7
IRON	< 0.060	< 0.060	< 0.060	< 0.060	0.019	< 0.01	< 0.01	0.3 s			0.019	< 0.01	7
LEAD	< 0.00100	< 0.00100	< 0.00100	< 0.00100	0.00013	0.00003	0.00035	TT	0		< 0.001	0.00003	7
MANGANESE	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.01	< 0.01	< 0.01	0.05 s			< 0.01	< 0.0040	7
MERCURY	< 0.000200	< 0.000200	< 0.00020	< 0.00020	< 0.0005	< 0.0005	< 0.0005	0.002	0.002		< 0.0005	< 0.00020	7
NICKEL	< 0.010	< 0.010	< 0.010	< 0.010	< 0.001	< 0.001	< 0.001	0.1 * * *	0.1 * * *		< 0.010	< 0.001	7
SELENIUM	< 0.00300	< 0.00300	< 0.00300	< 0.00300	< 0.001	< 0.001	< 0.001	0.05	0.05		< 0.00300	< 0.00300	7
SILVER	< 0.0050	< 0.0100	< 0.0050	< 0.0050	< 0.001	< 0.001	< 0.001	0.1 s			< 0.0050	< 0.001	7
SODIUM	3.05	3.95	2.62	4.54	2.57	3.94	7.35	unregulated		4.0	7.35	2.57	7
THALLIUM	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.001	< 0.001	< 0.001	0.002	0.0005		< 0.00100	< 0.001	7
ZINC	0.0151	< 0.0100	< 0.0100	< 0.0100	0.0125	0.012	0.0153	5 s		1	0.0153	< 0.010	7

RESULTS ARE IN mg/L EXCEPT WHERE OTHERWISE NOTED

* TT = Treatment Technique; s = Secondary MCL; t = State only MCL

* * Aluminum is a secondary regulated contaminant

*** The MCL and MCLG for Nickel were remanded on February 9, 1995, monitoring requirements still in effect

Appendix IV - Distribution System Disinfection By Products

CITY OF SPOKANE

Disinfection By Products TriHaloMethanes (THMs)

	Sample Date	Location	Chloroform	Bromodichloromethane	Chlorodibromomethane	Bromoform	Total THMs
First Quarter (Q1)	1/12/2012	Strong Road	< .50	0.51	1.00	0.69	2.29
	1/12/2012	Cedar Hills	< .50	0.67	0.89	<.50	1.56
	1/12/2012	Mallen Hill	< .50	0.67	0.91	<.50	1.58
	1/12/2012	BPA Easement	< .50	0.78	1.35	0.89	2.99
	1/12/2012	Eagle Ridge Two	0.53	0.91	1.08	0.61	3.13
	1/12/2012	Southview	< .50	1.16	2.33	1.78	5.27
Second Quarter (Q2)	4/12/2012	Southview	< .50	1.02	2.02	1.74	4.78
	4/12/2012	Cedar Hills	< .50	0.63	1.03	< .50	1.66
	4/12/2012	Eagle Ridge Two	< .50	0.87	1.11	0.53	2.51
	4/12/2012	Mallen Hill	< .50	< .50	0.63	< .50	0.63
	4/12/2012	BPA Easement	< .50	0.55	0.81	0.57	1.93
	4/12/2012	Strong Road	< .50	0.53	0.9	0.61	2.04
Third Quarter (Q3)	7/12/2012	Cedar Springs	< .50	< .50	< .50	< .50	< .50
	7/12/2012	Midbank	< .50	< .50	< .50	< .50	< .50
	7/12/2012	Southview	< .50	0.81	1.09	0.90	2.80
	7/12/2012	Eagle Ridge Two	0.32	0.55	0.57	< .50	1.44
	7/12/2012	Mallen Hill	< .50	< 0.50	< .50	< .50	< .50
	7/12/2012	BPA Easement	< .50	< 0.50	< .50	< .50	< .50
Fourth Quarter (Q4)	10/18/2012	Cedar Springs	0.27	<0.5	0.67	< 0.5	0.94
	10/18/2012	Midbank	0.28	0.66	0.93	0.51	2.38
	10/18/2012	BPA Easement	0.46	0.84	1.04	< 0.5	2.34
	10/18/2012	Mallen Hill	< 0.25	0.5	0.67	< 0.5	1.17
	10/18/2012	Eagle Ridge Two	0.3	0.6	0.84	< 0.5	1.74
	10/18/2012	Southview	0.33	0.78	1.17	0.78	3.08

					LRAA (locational running
Location	Q1 2012	Q2 2012	Q3 2012	Q4 2012	annual average)
Strong Road	2.29	2.04			2.17
Cedar Hills	1.56	1.66			1.61
Mallen Hill	1.58	0.63	0.00	1.17	0.85
BPA Easement	2.99	1.93	0.00	2.34	1.82
Eagle Ridge Two	3.13	2.51	1.44	1.74	2.21
Southview	5.27	4.78	2.80	3.08	3.98
Cedar Springs			0.00	0.94	0.47
Midbank			0.00	2.38	1.19

All values are reported in µg/L

Appendix IV - Drinking Water Testing Summary for 2012

CONTAMINANTS FOUND IN DRINKING WATER TESTING IN 2012 CITY OF SPOKANE, WATER & HYDROELECTRIC SERVICES

Data presented, if not from 2012, is from the most recent testing done in accordance with the regulations.

SOURCE WATER TESTING CONTAMINANT	Units	Highest Average	Detected Maximum	Detected min.	Number Positive Samples	Number of Samples	MCL	MCLG	MAJOR SOURCES		
Arsenic	µg/L	(a)	4.6	2.9	3	3	10	0	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes		
Nitrate	mg/L	(a)	3.68	0.76	10	10	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits		
Gross Alpha	pCi/L	(a)	2.3	< 1.0	1	2	15	0	Erosion of natural deposits		
Combined Radium 226 and 228 (b)	pCi/L	(a)	2.3	0.5	2	3	5	0	Erosion of natural deposits		
DISTRIBUTION SYSTEM TESTING			Detected	Detected	Number Positive	Number of					
CONTAMINANT	Units	LRAA	Maximum	min.	Samples	Samples	MCL	MCLG	MAJOR SOURCES		
Disinfection Byproducts - TTHMs [Total Trihalomethanes] (c)	µg/L	3.98	5.27	0.63	20	24	80	0	By-product of drinking water chlorination		
CONTAMINANT		Highest Perce	ent Detected	Sample Date	Violation	М	CL	MCLG			
Total Coliform Bacteria		0.60	%	one detection on July 2, 2012	No	5 % of monthly sa	5 % of monthly samples are positive		5 % of monthly samples are positive		Naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present
		date sampled	90th Percentile (e)	Number of Sites exceeding AL	Number Positive Samples	Number of Samples	MCL	MCLG]		
Copper (d)	mg/L	Aug-12	0.09	0	54	54	TT, AL= 1.3	1.3	Corrosion of household plumbing systems; Erosion of natural deposits: Leaching from wood preservatives		
Lead (d)	µg/L	Aug-12	3.80	0	54	54	TT, AL= 15	0	Corrosion of household plumbing systems; Erosion of natural deposits		

Notes

(a) Compliance with MCL is determined by single sample results, so no average is used.

(b) Gross Alpha results were used in lieu of Radium 226, one half of the detection limit of 1.0 was used for the ND

(c) Faucet samples were from 'at risk' homes (those with lead service lines and those with copper pipes with lead solder joints).

(d) 90% of at-risk homes had this concentration, or less, of lead/copper.

Key to Table

AL = Action Level = The concentration of a contaminant which, if exceeded, triggers treatment or other requirement which a water system must follow.

LRAA = Locational Running Annual Average

MCL = Maximum Contaminant Level = The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG = Maximum Contaminant Level Goal = The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

pCi/L = picocuries per liter (a measure of radioactivity)

µg/L = micrograms per Liter = parts per billion

mg/L =milligrams per Liter = parts per million

TT = Treatment Technique = A required process intended to reduce the level of a contaminant in drinking water.

ND = None Detected

< less than