2023 Annual Water Quality Monitoring Report
Spokane Valley-Rathdrum Prairie Aquifer
Long Term Monitoring Program

Prepared by:

Spokane County Water Resources

APRIL 2024

Executive Summary

The following report presents the field work, analytical results, quality assurance/quality control (QAQC) and findings from the Spokane Valley Rathdrum Prairie (SVRP) Aquifer Long Term Water Quality Monitoring Program for 2023. During the 2023 calendar year, the County's Water Resources staff completed our regular monitoring activities including assessing groundwater temperature, conductivity, pH, dissolved oxygen, major ions, nutrients, and trace metals from 51 monitoring locations quarterly. Staff collected 94 percent of the planned samples, as a few sampling locations had site-specific conditions that prevented sampling this year. The 2023 program data is provided in Appendix A.

The 2023 results indicate the SVRP Aquifer generally has good quality overall. Spokane County utilizes federal and state drinking water standards as a basis for discussing groundwater quality since the SVRP provides the source of drinking water for much of the region. During 2023, there were no exceedances of the Primary Maximum Contaminant Levels (MCLs). However, there were exceedances of the state trigger levels for two analytes: arsenic and nitrate. The four exceedances of the arsenic standard (0.005 mg/L) come from two locations, each with two exceedances: the Felts Field monitoring well (5312C01) and the Orchard Ave Irrigation production well at Park and Marietta (5312H01). The three exceedances of the nitrate trigger level (5 mg/L) were all from samples collected from the East Valley High School monitoring well (6436N01). There was also an exceedance of the secondary drinking water standard for manganese.

No special studies or analyses are included in this report since it follows the publication of a technical report assessing 20 years (from 1999 to 2019) of the program's data. Previous annual reports, program data, and the 20-year technical report are all available online at:
https://www.spokanecounty.org/1285/Groundwater-Monitoring

THE SVRP MONITORING PROGRAM AND THE PRODUCTION OF THIS REPORT WAS FUNDED BY
THE VOTER APPROVED AQUIFER PROTECTION AREA (APA) FEE ASSESSED BY THE COUNTY.
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Background

In 1978 the Environmental Protection Agency (EPA) designated the SVRP Aquifer as a "Sole Source Aquifer" under Section 1424(e) of the Safe Drinking Water Act. From May 1977 to June 1978 the Spokane County Water Quality Management Program conducted a one-year study of the aquifer to determine if surface "recharge" is occurring to carry ground surface pollutants to the aquifer and, if so, the effect of such activities. The study concluded that domestic, municipal, commercial, agricultural, and industrial activities do impact aquifer water quality.

The 1978 Spokane Aquifer Cause and Effect Report determined that on-site sewage systems contribute to water quality degradation in the SVRP aquifer. As a result, the 1979 Spokane Aquifer Water Quality Management Plan included the following:

The recommendations for handling sanitary wastewater and mitigation of its pollution to the groundwater include the collection of all sewage from urbanized areas and treatment for discharge in such manner that the pollutants cannot enter the aquifer. Central sewer planning within the aquifer sensitive area should result in sewering of areas that have been urbanized or are to be urbanized.

The 1983 update to the Spokane Aquifer Cause and Effect Report found that there was an increasing trend in nitrate concentrations in the aquifer confirming the need to address on-site sewage disposal.

Spokane County Utilities began implementation of the Septic Tank Elimination Program (STEP) to address concerns that onsite sewage systems contribute to water quality degradation in the aquifer. STEP was completed in 2012, though additional areas not included in STEP are still being connected to sewer.

As a result of the 1983 study findings, the *Spokane Aquifer Water Quality Management Plan* was developed. One recommendation of the plan was to develop and implement a long-term ground water quality monitoring program to assess the effectiveness of the STEP. From 1980 to 2000 the Spokane Regional Health District (SRHD) conducted the aquifer monitoring program and in 2000 the Spokane County Water Resources section of the Division of Utilities (formerly the Spokane Water Quality Management Program) undertook the aquifer monitoring program.

The original study included 80 sample locations. Sixty locations were existing water supply wells, both water purveyor and private wells, and 20 locations were dedicated monitoring wells. From 1980 to 1996 all sampling locations were water supply wells. In 1996 dedicated monitoring wells were added to the monitoring network. In 2007, four spring/seep sampling locations were added. Currently the monitoring network is comprised of 29 dedicated monitoring wells, 17 public supply wells and 5 spring locations. Figure 1 shows the current sampling locations.

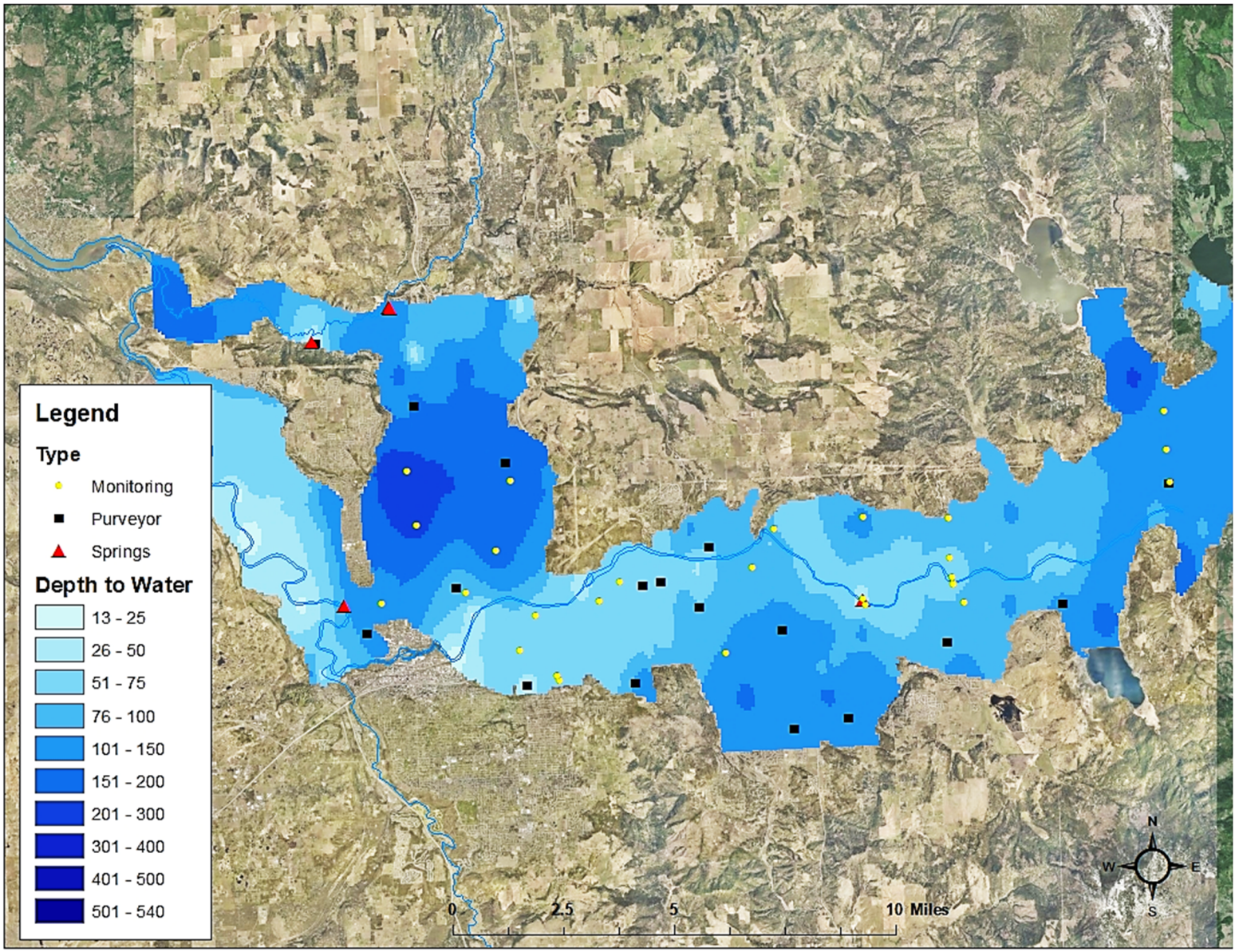

Figure 1. Map of the Spokane Valley Rathdrum Prairie Aquifer monitoring network with depth to water contours in feet.

Program Objectives

The SVRP long term monitoring program has three objectives: 1) Asses the current aquifer water quality; 2) Identify spatial and temporal water quality trends; and 3) Evaluate water quality trends that are related to the Spokane County Septic Tank Elimination Program.

Study Area and Hydrogeologic Setting

Aquifer Hydrology

The SVRP aquifer underlies about 370 square miles of relatively flat, alluvial valley surrounded by bedrock highlands (Kahle and others, 2005). The aquifer consists primarily of coarse-grained sediments including sand, gravels, cobbles, and boulders. There is generally a greater percentage of finer material near the margins of the valley and becomes more coarse near the center throughout the Rathdrum Prairie and Spokane Valley. In the northwest portion of the aquifer, often referred to as the Hillyard Trough, the deposits are finer grained and the aquifer consists of sand with some gravel, silt, and boulders. The aquifer is highly productive. Aquifer wells yield as much as several thousand gallons per minute with relatively little drawdown. The hydraulic conductivity of the aquifer sediments is at the upper end of values measured in the natural environment (Kahle et al, 2005)

Spokane River SVRP Aquifer Interaction

The Spokane River is the largest source of recharge to the aquifer and receives the largest amount of discharge from the aquifer. A groundwater budget for the SVRP Aquifer developed by the USGS in 2007 estimates the Spokane River discharges 718 cubic feet per second (cfs) to the aquifer, representing 49 percent of the total mean annual aquifer inflow of 1,417 cfs. The Spokane River receives an estimated 861 cfs from the aquifer representing 59 percent of the total mean annual outflow of 1,468 cfs. There are two distinct river reaches where the Spokane River receives water from the aquifer: 1) Flora Road to Greene Street; and 2) The Spokane Gage to Nine Mile Dam. These reaches are considered gaining reaches. There are also two distinct river reaches were the Spokane River discharges to the aquifer: 1) Coeur d'Alene Lake to Flora Road; and 2) Green Street to Monroe Street. These reaches are considered losing reaches. Aquifer water quality in the immediate vicinity of the river in the losing reaches is influenced by river water quality.

Monitoring Network

The current monitoring network includes 15 purveyor wells, 31 monitoring wells, and 5 natural springs for a total of 51 monitoring locations. The network is spatially distributed to provide information on water quality throughout the aquifer (Figure 1).

In addition to assessing general water quality, the monitoring network provides data for specific objectives. Four monitoring locations are at the Washington/Idaho border and provide a baseline to which water quality data from down gradient wells can be compared. At Barker Road, there are four monitoring locations that provide data to evaluate the water quality in the vicinity of a losing reach of the Spokane River. At Sullivan Road, there are three monitoring locations that provide data to evaluate water quality in the vicinity of a gaining reach of the Spokane River. The natural springs monitoring locations provide additional water quality information on aquifer water that enters surface water bodies, both the Spokane and Little Spokane Rivers.

Samples are collected in a manner to provide data on water quality at the surface of the aquifer. The rational for this approach is that impacts to the aquifer will occur first at the surface. There are two locations that have "nested wells" that provide data at the same location but different depths. Many of the water supply wells also withdraw water from greater depths than the dedicated monitoring wells.

Summary of Field Activities

Monitoring Events

In 2023, sampling events occurred quarterly and included measurement of field parameters and sample collection for laboratory analysis. Monitoring locations and sample collection varies each quarter as summarized in Table 1.

There are 27 sites regularly monitored every quarter. Field parameters are collected regularly at every site each quarter. Samples are collected for four parameters (chloride, nitrate+nitrite, total phosphorus, and soluble reactive phosphorus) at every site each quarter, with Quarter 2 (Spring) sampling being the only exception.

During Quarter 2 (Spring) sampling, five additional monitoring wells are included in the sampling event for a total of 32 sites being sampled during Quarter 2. The samples collected from the five added sites are only analyzed for metals (not the four regular analyses). In addition, a sample for metals analysis is collected at only one of the regular monitoring locations, 5507A04; none of the other regular monitoring locations are sampled for metals during Quarter 2. The metals included in the Quarter 2 analysis are listed in Table 1.

During Quarter 3 (Summer) sampling, all 51 sites are sampled for all parameters (Table 1).

In 2023, deviations from planned site visits and sampling occurred due to various site-specific conditions. Thes scheduled sampling and deviations are summarized in Appendix B.

The Orchard Avenue Irrigation District production well at Buckeye and Dick (5407C01) was not sampled in Quarter 1. This is the district's secondary well and is not always in use and running. Due to the costs of starting up the machinery, the County only collects samples when the district is running the well or is willing and able to start the machinery.

The Balfour Park (5417R02) monitoring well was decommissioned by the City of Spokane Valley sometime between Quarter 1 and 2 sampling during a recent construction project. Therefore, this well will no longer be a part of the County's monitoring network. The Euclid and Barker (5507A04) and the Trinity School (5307M01) monitoring wells were not sampled during Quarter 3. Construction blocked access to 5507A04 and a vehicle was parked over 5307M01, which is a flush mount well on a residential street near Adams and Carlisle.

The Trent and Barker (5505D01) well was not sampled in 2023 due to construction activities and new post-construction conditions affecting site access. A steep embankment is now present at this location, and it is no longer safe to carry the large portable pump to the well for sampling. The County will be installing a dedicated pump in the well so that staff can safely traverse the embankment without carrying heavy equipment to sample the well. The plan is to install the dedicated pump in Quarter 2 or 3 of 2024.

Table 1. Summary of SVRP monitoring locations and parameters by quarter.

	All Quarters	Added during Quarter 2 (Spring)	Added during Quarter 3 (Summer)
Sites			
Purveyor Wells	5322F01 5324G01 5312H01 5407C01 5405K01 5427L01 5426L03		5308A02 5213B01 5408N01 5415E03 5518R01 5515C01 6328H01 6320D01
Monitoring Wells	5417R02 5411R06 6631M07 5311J05 6524R01 5322A01 6525R01 5323E01 5505D01 5315L01 5507A04 5310Q01 6436N01 5308H01 5411R03 6327N04	5312C01 5507H01 5508M01 5508M02 5517D05	*Quarter 2 Wells 6631M04 5307M01 5304G01 6330J01 6331J01 6211K01 5311J07 5322A03 5409C02 5404A01
Springs	6306P01s 6306P01s2 6211J01s 5212F01s		5411R05s
Parameters			
Field Parameters	Water Temperature pH Dissolved Oxygen Specific Conductance		
Nutrients/Ions	Chloride Nitrate+Nitrite Total Phosphorus Soluble Reactive Phosphorus (SRP)		Fluoride
Metals		Arsenic (As) Cadmium (Cd) Copper (Cu) Lead (Pb) Mercury (Hg) Zinc (Zn)	*Quarter 2 metals Calcium (Ca) Chromium (Cr) Magnesium (Mg) Manganese (Mn) Potassium (K) Sodium (Na)

Field Methods

Dedicated monitoring wells were sampled in the following manner. The depth to groundwater in the well was measured and recorded on field sheets. The pump intake was rinsed with deionized water and then lowered to the appropriate sampling depth: the top of the screened interval or, if the water level was below the top of the screened interval, the pump was set 1 to 1.5 feet below the water table surface. The

monitoring wells were purged utilizing low-flow sampling techniques per EPA guidelines. Those techniques are described in the *Spokane County Water Resources Long Term Monitoring Program Quality Assurance Project Plan* (QAPP), August 2007. Water supply wells used for groundwater monitoring are run a minimum of five minutes before the sample is collected to obtain a representative sample. Groundwater samples are collected from spigots on the purveyor well discharge lines as close to the pump as possible. The field parameters such as depth-to-water, temperature, pH, dissolved oxygen, and specific conductance are recorded on field sheets. Groundwater samples are delivered to the laboratory under Chain-of-Custody procedures. Copies of the Chain-of-Custody forms are available on request.

Analytical Methods

Analytical services were provided by SVL Analytical in Kellogg, ID and IEH Aquatic Research in Seattle, WA as summarized in Table 2.

Table 2. Analytical methods

Lab	Parameter/Analyte	Method
SVL Analytical	Chloride, Fluoride	EPA 300
	Nitrate+Nitrite	EPA 353.2
	Mercury	EPA 245.1
	Metals	EPA 200.7 and 200.8
IEH Aquatic Research	Total Phosphorus	SM18 4500PF
	Soluble Reactive Phosphorus (SRP)	SM18 4500PF

Data Quality Assurance/Quality Control

Analytical results were validated to ensure data quality objectives as outlined in the QAPP were met. The QAQC validation process for each sampling event is provided in Appendix C and the results of this are discussed in this section.

Sensitivity

The sensitivity of analytical methods is defined by the method reporting limit and method detection limit. The County's QAPP outlines the reporting limits for each analyte. This helps to maintain programmatic consistency with data and establishes the threshold for non-detectable concentrations.

The method reporting limits and method detection limits met the requirements set forth in the QAPP except for as described in Table 3. The laboratory can set reporting limits to be consistent with the QAPP. However, during Quarter 2 and 3 the lab inadvertently utilized reporting limits for several metals inconsistent with the QAPP's reporting limits. In all cases, this resulted in reporting limits that are lower (more sensitive) than required by the QAPP.

Table 3. Comparison of reporting limits (RL) for metals analysis for the five metals in groundwater samples were inadvertently changed from those established in the QAPP.

Analyte	**QAPP RL (mg/L)**	**RL (mg/L)**
Cadmium	0.0002	0.0001
Chromium	0.0015	0.001
Copper	0.001	0.0004
Manganese	0.001	0.0004
Zinc	0.005	0.004

These deviations did not adversely affect the results. As a corrective action, the lab was asked to reissue the affected report to correct the reporting limits to be compliant with the QAPP. Due to the lower RLs, the initial results reported more samples detectable concentrations for these metals than typically occur using the QAPP reporting limit. In the initial reports, any samples with concentrations between the two reporting limits were reported as having a detectable concentration. However, in the reissued reports at the QAPP reporting limits, these samples are reported as non-detects as usual. While the affected samples are discussed in the Water Quality section for each of the metals, the results shown in Appendix A are reported as shown in the reissued lab reports for program consistency. Given the circumstances and the reissued reports, the sensitivity criteria were met.

Precision

Precision is measured by comparing the results of duplicate samples with the original sample.

A field duplicate is collected each day of sampling for all parameters being analyzed in that sampling event. The relative percent difference (RPD) between each sample and the associated field duplicate must be within 20 percent for each parameter. Where field duplicates do not meet this criterion the associated results from that sampling date are qualified with a "J" (indicating "estimated" data) according to the QAQC procedures outlined in the QAPP.

It should be noted that several field duplicates for total phosphorus and soluble reactive phosphorus (SRP) resulted in RPDs higher than the 20 percent threshold. However, these are a product of samples with relatively low concentrations that are close together and are not necessarily indicative of poor data quality. For example, a common occurrence is for a sample to have 0.003 mg/L and the duplicate to have 0.004 mg/L, which results in a RPD of 28.6 percent. In most cases, the QAQC procedures will not require qualifying the total phosphorus and SRP data due to a RPD greater than 20 percent.

Table 4. Results from the following sampling dates associated with the identified parameters will be qualified with a "J" due to the relative precent difference (RPD) being greater than 20 percent for field duplicates as established in the QAPP.

Quarter	Sampling Date	Parameter
2	4/25/2023	Total Phosphorus
2	5/10/2023	Copper
3	8/4/2023	Arsenic
3	8/4/2023	Nitrate
4	10/24/2023	SRP

Table 4 provides a summary of the data that will be qualified because of the field duplicate precision criteria not being met.

Laboratory duplicates are analyzed for total phosphorus and SRP only. Laboratory duplicates for these parameters must also be within 20 percent. The RPD for these samples were within the 20 percent criteria.

Laboratory matrix spike (MS) and a matrix spike duplicate (MSD) are analyzed for all parameters. The RPD between the MS and MSD must also be within 20 percent. The laboratory

Table 5. Results from the following sampling date/laboratory work order associated with the identified parameters will be qualified with a "J" due to the relative precent difference (RPD) being greater than 20 percent for MS/MSD duplicates as established in the QAPP.

Quarter	Sampling Date	Work Order	Parameter
3	7/25/2023	X3G0424	Arsenic
3	7/25/2023	X3G0424	Cadmium
3	7/25/2023	X3G0424	Chromium
3	7/25/2023	X3G0424	Copper
3	7/25/2023	X3G0424	Manganese

MS/MSD this criterion for each analyte, except as summarized in Table 5. The associated data will be qualified because of the MS/MSD precision criteria not being met.

Accuracy

A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard. Analytical accuracy is measured by comparing the percent recovery of analytes spiked into a laboratory control sample (LCS), matrix spike (MS) and matrix spike duplicate (MSD) to the acceptance limits. A LCS, MS and MSD are analyzed for each parameter. For recoveries not within the acceptance limits, the QAPP requires qualifying the associated data.

The LCS recoveries and the matrix spike recoveries were within applicable limits. Table 6 summarizes instances where the MSD recoveries were outside of the acceptance limits outlined in the QAPP. However, in exercising professional judgement, only one of these instances requires qualifying the data.

Table 6. Results from the following sampling dates associated with the identified parameters will be qualified with a "J" due to the MSD recoveries being outside the acceptance limits established in the QAPP and laboratory.

Quarter	Work Order	Parameter	Qualify Data?	Rationale
1	X3A0304	Nitrate	No	Lab note indicates this MSD recovery is not useful due to dilution; all other QAQC criteria are met.
3	X3G0424	Arsenic	No	Not within acceptance limits set in QAPP but within acceptance limits established by the analytical method
3	X3G0424	Chromium	Yes	Not within acceptance limits set in the QAPP nor those established by the analytical method
3	X3G0424	Manganese	No	Not within acceptance limits set in QAPP but within acceptance limits established by the analytical method
3	X3H0095	Cadmium	No	Not within acceptance limits set in QAPP but within acceptance limits established by the analytical method
3	X3H0095	Copper	No	Not within acceptance limits set in QAPP but within acceptance limits established by the analytical method
3	X3H0095	Lead	No	Not within acceptance limits set in QAPP but within acceptance limits established by the analytical method

It should be noted that for the metals, the QAPP identifies more stringent acceptance limits than currently applied by the laboratory per the published analytical method standard operating procedures. This is a result of the QAPP being outdated and the County recognizes the need to update the QAPP to current analytical methodologies and practices.

Bias

Bias is primarily detected using the results of the prepared blank samples, which include an equipment blank, field blank, and the laboratory method blank for this study. One equipment blank and one field blank are prepared for each quarter sampling event. Method blanks were prepared by the laboratory for each set of analysis.

The analytical results for the field and method blanks did not indicate any bias had been introduced. All blank results were reported as non-detect, or below the method reporting limit. However, it should be

noted that the changes in reporting limits resulted in a detectable concentration of copper in a single equipment blank in the initial laboratory report (Table 7).

Table 7. Field and Equipment Blank Detections.

Sampling Event	Equipment Blank Detections (mg/L)
Qtr 3	Copper (0.00096)

The QAPP requires a reporting limit of 0.001 mg/L for copper and the Quarter 3 lab reports were initially issued with a reporting limit of 0.0004 mg/L. The reporting limits for several metals were inadvertently changed during Quarter 3 by the laboratory, resulting in initial lab reports not consistent with the QAPP. The County requested affected lab reports to be reissued with the appropriate reporting limits for programmatic consistency. The reissued report does not indicate a detection in the Quarter 3 equipment blank.

However, to maintain transparency in demonstrating this does not affect the copper results, the results from the Quarter 3 sampling events were examined to determine whether there were any potential anomalies in sample concentrations for analytes with original detection in the equipment blank.

QA/QC procedures require qualifying sample data with an "R" (Reject) if the concentration of an analyte detected in a blank is greater than 10 percent of the sample's concentration of that analyte. The threshold sample concentration at which the blank concentration would be 10 percent is calculated by the following equation:

$$\text{Threshold Concentration (mg/L)} = 10 \times \text{Blank Concentration (mg/L)}$$

A sample's concentration must be above the calculated threshold for the blank's concentration to account for less than 10 percent of the analyte in the sample. Therefore, samples at the threshold level or below could be rejected per the QA/QC procedures. However, professional judgement can also be exercised by examining the sample data against historic data before rejecting the results.

The original equipment blank concentration results in a threshold concentration of 0.0096 mg/L. Most Quarter 3 samples (all except two) had concentrations below the threshold. About half of the samples with concentrations below the threshold (26 samples) were non-detect (below the original reporting limit of 0.0004 mg/L). Therefore, the potential equipment blank contamination is considered not to affect these samples.

The remaining half (25 samples) had results ranging from 0.00041 to 0.00392 mg/L. However, twelve (12) of these samples had concentrations that were reported as non-detect after the lab reports were re-issued using the QAPP reporting limit and the remainder fall within normal ranges for each location (Table 8). Therefore, the sample results for copper from Quarter 3 samples are deemed of sufficient quality for reporting and analytical purposes and are not rejected.

Table 8. Quarter 3 samples with copper concentrations at or below the threshold of 0.0096 mg/L used for rejection based on blank contamination and whether data was rejected based on historic values. Results shown are from the initial lab report using a more stringent reporting limit (RL) for copper (0.0004 mg/L). Those in red indicate that the concentration was subsequently reported as non-detect in the re-issued lab reports utilizing the RL consistent with the QAPP (0.001 mg/L). Historic data is based on the QAPP RL with non-detects equated to zero. *Duplicate sample.

Sample ID/ Location	Copper Result (mg/L)	Historic Copper Data through 2020 (min, Q1, median, Q3, max (mg/L))					Reject?
		Min	Q1	Median	Q3	Max	
5212F01s	0.00087	0	0	0	0.0012	0.0019	No
5213B01	0.00148	0	0	0.0011	0.0013	0.0077	No
5304G01	0.00081	0	0	0	0.0012	0.0058	No
5308H01	0.00052	0	0	0	0	0.0045	No
5312C01	0.00096	0	0	0.0011	0.0016	0.0089	No
5322F01	0.00392	0	0.0004	0.0012	0.0019	0.0082	No
5324G01	0.00142	0	0.0018	0.0023	0.0043	0.0235	No
5405K01	0.00109	0	0.0013	0.0019	0.0035	0.125	No
5407C01	0.00206	0	0	0.0023	0.003	0.0179	No
5408N01	0.00113	0	0	0	0.0015	0.0380	No
5426L03	0.00119	0	0	0	0.0006	0.0013	No
5427L01	0.00168	0	0.001	0.0015	0.0026	0.0148	No
5427L01*	0.00171						
5507H01	0.00062	0	0	0	0.0012	0.0057	No
5508M01	0.00048	0	0	0	0	0.0014	No
5508M02	0.00046	0	0	0	0.0004	0.0164	No
5515C01	0.00263	0	0.0011	0.0018	0.0026	0.0414	No
6211K01	0.00045	0	0	0.0005	0.002	0.18	No
6320D01	0.00055	0	0	0	0	0.0082	No
6327N04	0.00041	0	0	0	0	0.0022	No
6328H01	0.00163	0	0	0.0011	0.0013	0.146	No
6330J01	0.00056	0	0	0	0	0.03	No
6436N01	0.00217	0	0	0	0.0013	0.0099	No
6631M04	0.00079	0	0	0	0.0014	0.0047	No

Bias can also be introduced if a sample is analyzed for a parameter outside of its established holding time. It is standard to assume that the concentration is biased low when a sample is analyzed outside of the holding time, though major exceedances should cause the data to be rejected. However, some analytes are more stable than others, so data must be reviewed to determine usability.

Only one set of samples were analyzed outside of the method holding time. SRP samples collected on August 4, 2023 were analyzed one

Table 9. Soluble Reactive Phosphorus (SRP) results from the Aug. 4, 2023 samples analyzed outside of the 48-hour holding time. These will be qualified with a "G" for not meeting the holding time criterion.

Site	SRP Result (mg/L)	Q1	Median	Q3
5404A01	0.032	0.039	0.059	0.137
5411R03	0.003	0.003	0.004	0.005
5411R03*	0.004			
5411R05s	0.003	0.002	0.004	0.005
5411R06	0.004	0.003	0.003	0.004
6436N01	0.041	0.040	0.044	0.049

day outside of the 48-hour holding time. However, the results for the affected samples appear to be within normal range for the location (Table 9). Therefore, the data appears to be usable, and the results will be qualified with a "G" for being biased low.

Representativeness

Given that County staff followed the procedures in QAPP and the QA/QC findings, the sampling analytical results are deemed to be representative of groundwater conditions at the time of sampling and are of sufficient quality to be used for any future analysis.

Completeness

Completeness is a measure of the number of valid results against the possible number of results. It is adjusted for any instance where a sample could not be collected or analyzed. The goal is 95 percent.

Since the QAQC did not result in any results being rejected (e.g., qualified with an "R"), 100 percent of the data received is considered valid.

As mentioned, some locations could not be sampled due to various site-specific conditions, but these are not counted in the possible number of results. For transparency, accounting for the missed samples, the County was able to collect approximately 93 percent of the 2023 scheduled groundwater samples.

Water Quality Results

The following section summarizes the 2023 analytical results for all water quality parameters. Quarterly analytical and field results are presented in Appendix A.

Only certain parameters have Primary Maximum Contaminant Levels (MCL) and Secondary drinking water standards defined by the EPA (40 CFR Chapter 1 Part 141) and State of Washington (WAC 246-290-310) (Table X). Primary MCLs are standards set for the protection of human health. Secondary Drinking Water Regulations (secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. The EPA recommends secondary standards to water systems but does not require systems to comply.

Table 10. Washington State Drinking Water Standards

Analytes	Drinking Water Standards		
	MCL	Trigger Level	Secondary
Nitrate+Nitrite	10	5	-
Arsenic	0.01	0.005	-
Lead	0.015	-	-
Copper	1.3	-	-
Mercury	0.002	0.0004	-
Cadmium	0.005	0.005	-
Chromium	0.1	0.02	-
Fluoride	4	0.5	2
Chloride	-	250	250
Zinc	-	5	5
Manganese	-	0.05	0.05

The State of Washington has also identified "trigger levels" for some contaminants (Table 7). Trigger levels are analyte concentrations that trigger additional sampling requirements for public water purveyors.

During 2023 there were no exceedances of the Primary MCLs; however, there were exceedances of the state trigger levels for three analytes: arsenic, manganese, and nitrate. In regulation, these standards apply to source sampling performed by public water purveyors as prescribed in State of Washington Drinking Water regulations. These standards provide a basis for comparison for the Long-Term Monitoring

Program results and exceedances of these standards are noted in this report. However, such exceedances do not constitute a basis for regulatory action, as this is a non-regulatory monitoring program.

Several analytes (lead, copper, manganese, mercury, cadmium, chromium, zinc, and fluoride) are generally not detectable in samples, having more than 75 percent of samples reported as below the laboratory detection limits.

A detailed discussion regarding the results for each analyte follows.

Arsenic

Arsenic occurs naturally as a trace element in many types of rock and sediment. Therefore, it can enter groundwater through natural biogeochemical processes depending on conditions in the aquifer and the chemical form of the arsenic. Natural groundwater may contain trace levels (0.1 mg/L or less) of arsenic. Arsenic can also enter groundwater though discharges from agricultural and industrial practices.

Arsenic (As)

59 samples

15% Non-Detect (<0.001 mg/L)

Range: 0.00109 – 0.0061 mg/L

4 exceedances of State Trigger

Arsenic in drinking water is a health hazard. It is toxic at low levels and is a known carcinogen. Exposure can cause skin damage, circulatory system problems, and increased risk of cancer. For this reason, arsenic has a primary MCL of 0.010 mg/L and a trigger level of 0.005 mg/L.

During 2023, 59 groundwater samples were analyzed for arsenic. Arsenic levels detected across all samples range from below the analytical method reporting limit (0.001 mg/L) to 0.00661 mg/L. There were four samples with arsenic concentrations above the state trigger level. Nine samples (or approximately 15 percent) were non-detect.

Cadmium

Cadmium is a naturally occurring element often associated with lead, copper and zinc ores. Therefore, it can enter groundwater from erosion of natural deposits in the earth. Natural groundwater may contain trace levels (0.1 mg/L or less) of cadmium. Anthropogenic sources include discharges from metal refineries, corrosion of galvanized pipes, and runoff from wastes from batteries and paints.

Cadmium in drinking water is a health hazard. Exposure through consumption can adversely affect the kidneys and bone. Cadmium has a primary MCL of 0.005 mg/L, which is also the State trigger level.

During 2023, 59 groundwater samples were analyzed for cadmium and all samples were below the reporting limit set in the QAPP (0.0002 mg/L).

Cadmium (Cd)

59 samples

100% Non-Detect (<0.0002 mg/L)

As noted, the laboratory initially utilized a smaller reporting limit of 0.0001 mg/L during Quarter 2 and 3. Only two samples were affected by the change in reporting limits. One sample from two different monitoring wells adjacent to the Spokane River

(5507H01 and 5508M01) had initial detectable levels (0.00016 and 0.00015 mg/L respectively) that were subsequently reported as non-detects in the re-issued lab reports. Therefore, there is little risk of cadmium reaching or exceeding the MCL.

Calcium

Calcium is naturally very abundant, occurring in rocks, bones and shells. Natural sources of calcium include feldspars, gypsum, dolomite, aragonite, calcite, amphiboles, and pyroxenes. Calcium is major constituent in natural groundwater. Calcium, along with magnesium, can contribute to water hardness. Hardness is a characteristic of water which can enhance its palatability.

Calcium is not a health hazard in drinking water and therefore no drinking water standards are established. During 2023, 51 groundwater samples were analyzed for calcium. Calcium levels detected across all samples range from 5.48 mg/L to 70.5 mg/L.

Chloride

Natural sources of chloride are primarily sedimentary rocks (e.g. halite or sylvite) with some igneous rocks. Chloride minerals from sedimentary rocks are highly soluble in water, resulting in chloride being present in all natural waters. Concentrations of chloride varies greatly, with sea water having the maximum level at ~35,000 mg/L. It is a major constituent of natural groundwater. Anthropogenic sources of chloride include sewage, some industrial effluents, and deicers.

Chloride does not pose a health hazard. Chloride is an aesthetic contaminant and has a secondary water quality of 250 mg/L to maintain palatability and use. The State trigger level is also 250 mg/L. Levels above 250 mg/L will cause water to taste salty. High chloride levels may also make water unsuitable for uses such as agriculture.

During 2023, 137 groundwater samples were analyzed for chloride. Chloride levels across all samples range from 1.95 mg/L to 120 mg/L. Therefore, the secondary water quality standard and State trigger level were not exceeded.

Chromium

Chromium is a naturally occurring metal found in rocks and soil. Therefore, it can enter groundwater through erosion of natural deposits. Natural groundwater contains trace levels (0.1 mg/L or less) of chromium. Anthropogenic sources include discharges from pulp and steel mills, and other industrial processes.

There are two forms of chromium that may be present in natural waters: trivalent chromium (chromium-3) and hexavalent chromium (chromium-6). Chromium-6 is the form that presents a health concern. Exposure to chromium-6 can cause allergic dermatitis.

However, since chromium can change forms in water and in the body, the drinking water standards are set for total chromium. Chromium has a Primary MCL of 0.1 mg/L and a state trigger level of 0.02 mg/L.

Chromium (Cr)

51 samples

94% Non-Detect (<0.0015 mg/L)

Range: 0.00181– 0.00580 mg/L

In 2023, 51 groundwater samples were analyzed for total chromium. Chromium levels across all samples ranged from below the analytical method reporting limit to 0.0058 mg/L. Most samples (n = 48, or 94 percent) were non-detect at the reporting limit set in the QAPP (0.0015 mg/L).

As noted, the laboratory initially utilized a smaller reporting limit of 0.001 mg/L during Quarter 2 and 3. Only one sample was affected by the change in reporting limits; a sample from 5322A01 collected on July 31, 2023 had an initial concentration of 0.00122 mg/L and was subsequently reported as non-detect in the re-issued lab report. Therefore, the drinking water standards were met.

Copper

Copper is found naturally in rocks and soil as a pure metal as well as in copper sulfides, oxides, carbonates, and in complex copper minerals containing iron, nickel, cobalt, lead, zinc, silver or other elements. While natural groundwater contains trace levels of copper, levels over 0.05 mg/L are not naturally encountered and may indicate pollution. Sources of contamination to groundwater are industrial discharges. Corrosion of household plumbing systems can lead to excess copper in drinking water, cause metallic taste, and blue-green staining.

Copper (Cu)

59 samples

73% Non-Detect (<0.001 mg/L)

Range: 0.00109 – 0.0201 mg/L

While some copper intake is necessary for human health, exposure above certain levels can cause a variety of symptoms related to copper poisoning. Concentrations between 2.8 and 7.8 mg/L can cause signs of gastrointestinal distress such as vomiting or diarrhea. More severe cases of copper poisoning result in anemia, liver or kidney damage. To prevent adverse health effects associated with copper, the primary MCL is 1.3 mg/L and the secondary standard is 1.0 mg/L.

During 2023, 59 groundwater samples were analyzed for copper. Most samples (n = 43, or 73 percent) were non-detect at the reporting limit set in the QAPP (0.001 mg/L). The remaining samples had concentrations ranging from 0.00109 to 0.0201 mg/L. Therefore, the copper MCL and secondary standard was never reached or exceeded.

As noted, the laboratory initially utilized a smaller reporting limit of 0.0004 mg/L for copper during Quarter 2 and 3. Twelve samples collected in Quarter 3 were affected by the change in reporting limits; these samples initially had detectable levels of copper ranging from 0.00041 to 0.00096 mg/L but were subsequently reported as non-detect in the re-issued lab reports. These are listed in Table 8.

Fluoride

Fluoride is classified as any binary compound of another element bonded with fluorine. Fluorine is a natural trace element that exists in almost all soils. Natural sources of fluoride include amphiboles (hornblende), apatite, fluorite, fluorspar, cryolite, and mica. Fluoride is considered a secondary constituent of natural groundwater; secondary constituents are generally present in groundwater in concentrations between 0.01 to 10 mg/L.

Though fluoride salt is often added to drinking water at about 1 mg/L for the purposes of preventing tooth decay, fluoride in drinking water at higher concentrations is a health hazard. Fluoride at concentrations

of more than 2 mg/L can result in a condition called mottling or discoloration of permanent teeth in children. Exposure to 4 mg/L or more for many years can cause skeletal fluorosis, where bones become extremely brittle. To prevent such adverse health effects, fluoride has a primary MCL of 4 mg/L and a State trigger level of 0.5 mg/L.

During 2023, 51 groundwater samples were analyzed for fluoride. Most samples (n = 48, or 94 percent) were non-detect, or below the analytical method reporting limit (0.1 mg/L). Detectable fluoride levels across all samples ranged from 0.119 to 0.253 mg/L. A sample from the Plantes Ferry monitoring well, which is completed in a confined aquifer with unique conditions, has the highest concentration. The MCL and secondary standard was never reached or exceeded.

Lead

Lead is a naturally occurring metal found in rocks and soils. However, naturally occurring lead in a pure metallic form is rare and it is often found in combination with other minerals. The most common source of lead is sulfide, or galena. Lead tends to bind to soils and sediments which limits its presence in water. For this reason, natural groundwater only contains trace levels (0.1 mg/L or less) of lead. Levels above this may indicate pollution is occurring. Sources of contamination to groundwater may include industrial and mine discharges.

Lead (Pb)

59 samples

98% Non-Detect (<0.001 mg/L)

Range: 0.00155 mg/L

Any exposure to lead can cause adverse health effects including damage to the nervous system, kidneys, and bone marrow. In children, lead can cause delays in physical and mental developments leading to decreased attention span and learning disabilities. For this reason, lead has a federal action level of 0.015 mg/L.

During 2023, 59 groundwater samples were analyzed for lead. Lead levels were below the analytical method reporting limit (0.001 mg/L) for all but one sample which had 0.00155 mg/L. Therefore, the federal action level was never reached or exceeded.

Manganese

Manganese is naturally found in soils, ores and rock, and is common in many groundwater sources. Natural sources of manganese include metamorphic and sedimentary rocks, mica biotite, amphibole hornblende. Natural groundwater contains trace levels of manganese (0.1 mg/L or less).

Manganese is not a health hazard in drinking water and therefore no primary MCL was established. Manganese is an aesthetic contaminant and has a secondary water quality standard of 0.05 mg/L. At this level and above, water may be cloudy, form black precipitates, contribute

Manganese (Mn)

51 samples

71% Non-Detect (<0.001 mg/L)

Range: 0.00189 – 0.308 mg/L

1 exceedance of

Secondary Standard

to mineral depositing in pipes or cause difficulty in sudsing and darkening of clothing during washing.

In 2023, 51 groundwater samples were analyzed for manganese. Most samples (n = 43, or 84 percent) were non-detect, or below the reporting limit set in the QAPP (0.001 mg/L). Detectable manganese levels range from 0.00189 to 0.308 mg/L. There was one exceedance of the secondary water quality standard: a sample from Plante's Ferry Park, which had the highest concentration measured (0.308 mg/L). However, this monitoring location is within a confined aquifer that has unique water quality characteristics. Of the remaining seven samples with detectable levels of manganese, three have concentrations below 0.009 mg/L and four have concentrations ranging from about 0.01 to 0.025 mg/L.

Table 11. Original manganese results for samples with concentrations above 0.0004 mg/L but below the QAPP reporting limit of 0.001 mg/L. These are reported as non-detect (<0.001 mg/L) in Appendix A per the QAPP and reissued laboratory reports.

Site	Sample Date	Result (mg/L)
5311J07	8/3/2023	0.00094
5312C01	8/1/2023	0.00049
5322A01	7/31/2023	0.00046
5411R05s	8/4/2023	0.00066
5411R06	8/4/2023	0.00074
6330J01	8/1/2023	0.00084
6525R01	8/3/2023	0.00053

As noted, the laboratory initially utilized a smaller reporting limit of 0.0004 mg/L for manganese during Quarter 2 and 3. Seven samples collected in Quarter 3 were affected by the change in reporting limits; these samples initially had detectable levels of manganese ranging from 0.00046 to 0.00094 mg/L but were subsequently reported as non-detect in the re-issued lab reports. These are summarized in Table11.

Magnesium

Magnesium is a naturally occurring mineral found in rocks and soils. Natural sources of magnesium include dolomite, magnesite, amphiboles, olivine, pyroxenes and clay minerals. It is a primary constituent of natural groundwater. Magnesium does not have applicable drinking water quality standards. Like calcium, magnesium contributes to water hardness. Hardness is a characteristic of water which can enhance its palatability. Magnesium is not a health hazard in drinking water and, therefore, there are no drinking water standards. In 2023, 51 groundwater samples were analyzed for magnesium. Magnesium levels across all samples range from 1.6 to 29.7 mg/L.

Mercury

Mercury is a naturally occurring metal, but it is rare in pure metallic form. However, mercury can be found in inorganic and organic forms. Natural sources of inorganic mercury include cinnabar ore (mercuric sulfide) and calomel. The most common organic form of mercury is methylmercury. Mercury has the highest solubility in water of any metal. Some microorganisms and natural processes can change mercury from one form to the other. Both organic and inorganic forms of mercury can be found in groundwater. Sources of contamination to groundwater may include discharge from refineries and factories and runoff from agricultural land and landfills.

Mercury (Hg)

59 samples

100% Non-Detect (<0.0002 mg/L)

Table 11. Original manganese results for samples with concentrations above 0.0004 mg/L but below the QAPP reporting limit of 0.001 mg/L. These are reported as non-detect (<0.001 mg/L) in Appendix A per the QAPP and reissued laboratory reports.

Site	Sample Date	Result (mg/L)
5311J07	8/3/2023	0.00094
5312C01	8/1/2023	0.00049
5322A01	7/31/2023	0.00046
5411R05s	8/4/2023	0.00066

Exposure to all forms of mercury at high levels can permanently damage the brain and kidneys. In pregnant women, mercury can also adversely affect the fetus. Methylmercury is more harmful than other forms, because it can bioaccumulate in tissues. To protect against adverse health effects, the primary MCL for mercury is 0.002 mg/L and the state trigger level is 0.0004 mg/L. This is for total mercury in water.

In 2023, 59 groundwater samples were analyzed for mercury. Mercury was not detected in any of the samples, as sample concentrations were below the analytical method reporting limit (0.0002 mg/L). Both the mercury MCL and the state trigger level were never reached or exceeded.

Nitrate

Nitrogen is a naturally occurring element that exists in many forms in the environment including nitrate, nitrite, and ammonia. Natural sources of nitrogen include atmospheric nitrogen, legumes, plant debris, decaying organic matter, animal excrement, and soils. Most nitrogenous materials are quickly converted to nitrate in natural waters, which is the final oxidation product of nitrogen. Nitrite is an intermediate form that occurs in the nitrogen cycle, and is not usually present in high concentrations. Past monitoring efforts confirmed this for the SVRP, which found that nitrite is typically negligible in groundwater samples. For this reason, the analytic method tests for both nitrate and nitrite (nitrate+nitrite), but is assumed to be and is reported as nitrate.

Nitrate

137 samples

<1% Non-Detect (<0.05 mg/L)

Range: 0.068 – 6.49 mg/L

3 exceedances of State Trigger

Nitrate is a secondary constituent of natural groundwater and may be present in concentrations between 0.1 to 10 mg/L. Concentrations higher than the local average may suggest pollution is occurring. Sources of nitrate contamination in groundwater include septic tanks, nitrogen-rich fertilizers, and agricultural processes.

Nitrate presents a health hazard in drinking water. Nitrate is especially harmful to infants, who consume a large quantity of water relative to their body weight. Nitrate concentrations above the MCL can lead to methemoglobinemia, a condition that reduces the oxygen carrying capacity of blood. To prevent such adverse health effects, nitrate has a primary MCL of 10 mg/L and a trigger level of 5 mg/L.

In 2023, 137 groundwater samples were analyzed for nitrates. Nitrate across most samples range from 0.068 to 6.49 mg/L. Only one sample was non-detect (below the analytical method reporting limit of 0.05 mg/L). There were three samples with exceedances of the state trigger level, all from the East Valley High School monitoring well.

Phosphorus

Phosphorus is a naturally occurring mineral that is rare in its pure elemental form. Phosphorus is usually found as organic and inorganic phosphate, and will change forms as it cycles through the environment. Natural groundwater usually contains trace levels (0.1 mg/L or less) of phosphate. Anthropogenic sources of phosphate to groundwater include septic systems, agricultural run-off, and run-off from fertilized lawns.

Phosphorus does not have applicable drinking water quality standards but can be a concern for general surface water quality. Phosphorus is often limited in freshwater systems and excessive phosphorus can cause accelerated plant and algae growth, which can lead to low dissolved oxygen and fish kills.

Since different forms of phosphate may be present in groundwater, samples are analyzed for both total phosphorus and soluble reactive phosphorus (SRP). Analysis for total phosphorus, like it sounds, measures all forms of phosphorus present in the water sample. Analysis for SRP measures the dissolved portion of inorganic phosphorus within the water sample.

In 2022, 136 groundwater samples were analyzed for total phosphorus and the same for SRP.

Two percent (n = 3) of total phosphorus samples were non-detect, or below the analytical method reporting limit (0.002 mg/L). Total phosphorus levels across all other samples ranged from 0.002 to 0.317 mg/L.

Six percent (n = 8) of SRP samples were non-detect, or below the analytical method reporting limit (0.001 mg/L). The remaining samples had SRP concentrations ranging from 0.00101 to 0.0413 mg/L.

Potassium

Potassium is a natural mineral found in feldspars (orthoclase and microcline), feldspathoids, some micas, and clay minerals. Potassium is considered a secondary constituent of groundwater, meaning it may be present in groundwater at concentrations between 0.1 and 10 mg/L. Potassium is not a health hazard for drinking water. Therefore, no drinking water standards have been set. In 2023, 51 groundwater samples were analyzed for potassium. Potassium levels across all samples ranged from 0.81 to 5.6 mg/L.

Sodium

Sodium is a naturally abundant mineral in rocks and soils such as feldspars (albite), clay minerals, and evaporates such as halite. Sodium is a primary constituent of natural groundwater. There are no applicable drinking water quality standards for sodium. In 2023, 51 samples were analyzed for sodium. Sodium levels across all samples ranged from 2.31 mg/L to 11.90 mg/L.

Zinc

Zinc is a naturally occurring metal that is often found with lead, copper, and silver ores. Zinc also forms salts and zinc compounds by combining with other elements such as chlorine, oxygen, and sulfur. Natural groundwater contains trace levels (0.1 mg/L or less) of zinc.

Zinc is an aesthetic contaminant and has a secondary water quality of 5 mg/L to maintain palatability and use. The State trigger level is also 5 mg/L. Above this concentration, zinc can cause metallic taste and can add to corrosion and staining of pipes and fixtures.

In 2023, 59 samples were analyzed for zinc. However, most samples (n = 43, or 73 percent) were non-detect at the reporting limit set in the QAPP (0.005 mg/L). Zinc levels across samples with detectable levels ranged from 0.0052 to 0.211 mg/L.

Zinc (Zn)

59 samples

73% Non-Detect (<0.005 mg/L)

Range: 0.0052 – 0.211 mg/L

As noted, the laboratory initially utilized a smaller reporting limit of 0.004 mg/L for zinc during Quarter 2 and 3. One sample collected August 1, 2023 from 6328H01 was affected by the change in reporting limits; this sample initially had detectable levels of zinc of 0.00043 mg/L but was subsequently reported as non-detect in the re-issued lab reports.

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APPENDIX A:

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring

2023 Quarterly Results

Well Name				I.E. COLD STORAGE	Denver & Marietta, City monitoring well				CITY of SPOKANE-Nevada	Franklin Park, City monitoring well	Holy Cross, Rhoades & Washington monitoring well
WQMP Well ID				5213B01	5308H01				5308A02	6331J01	6330J01
SampleID/Comment				5213B01	5308H01	5308H01	5308H01	5308H01*	5308A02	6331J01	6330J01
Quarter				3	1	2	3	4	3	3	3
Sample Date				7/25/2023	2/2/2023	5/2/2023	7/31/2023	11/8/2023	7/25/2023	8/1/2023	8/1/2023
Static Water Level (ft)				-	79.65	77.14	83.47	80.92	-	207.64	211.74
Sample Depth (ft)				-	86	86	86	86	-	212	213
Conductivity (µS/cm)				361.9	-	183.8	190.9	230	209.7	233.4	255.7
Water Temperature (C°)				11.8	13.6	14.3	13	13.9	12.8	16	15.5
pH				7.88	-	7.91	7.75	7.65	8.11	8.13	8.06
Analytes	Standards										
	MCL[1]	Trigger Level[2]	Secondary								
Phosphorus				0.010	0.004	0.004	0.004	0.003	0.007	0.005	0.004
SRP[3]				0.010	0.003	0.002	0.003	<0.001	0.003	0.003	0.002
Nitrate+Nitrite	10.00	5.00		1.68	0.88	0.88	0.91	0.93	0.87	0.77	0.93
Arsenic	0.01000	0.005		0.00326	-	-	0.00222	-	0.00292	0.00361	0.00316
Lead[4]	0.015			<0.001	-	-	<0.001	-	<0.001	<0.001	<0.001
Copper[4]	1.30000			0.00148	-	-	<0.001	-	0.02010	<0.001	<0.001
Mercury	0.002	0.0004		<0.0002	-	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Cadmium	0.005	0.005		<0.0002	-	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Chromium	0.10000	0.02		<0.0015	-	-	<0.0015	-	<0.0015	0.00347	<0.0015
Fluoride	4.000	0.5	2.0	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1
Chloride		250	250	36.9	7.1	7.1	7.0	7.2	6.8	5.4	6.0
Sodium				11.90	-	-	3.43	-	3.30	2.88	3.43
Zinc		5.0	5.0	<0.005	-	-	<0.005	-	0.0080	<0.005	<0.005
Magnesium				14.20	-	-	7.60	-	9.05	11.80	13.80
Potassium				2.58	-	-	1.32	-	1.43	1.59	1.71
Manganese		0.05	0.05	<0.001	-	-	<0.001	-	<0.001	0.0086	<0.001
Calcium				41.9	-	-	22.5	-	26.8	25.5	26.7

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				WHITWORTH WATER DIST. #2, Well 2A	NORTH SPOKANE IRRIG. DIST. # 4, Site 4	Fire Station Houston & Regal, No. Spokane WD					Trinity School, Adams & Carlisle, City monitoring well	NE Community Center, City monitoring well
WQMP Well ID				6320D01	6328H01	6327N04					5307M01	5304G01
SampleID/Comment				6320D01	6328H01	6327N04	6327N04	6327N04	6327N04a	6327N04	5307M01	5304G01
Quarter				3	3	1	2	3	3	4	3	3
Sample Date				8/1/2023	8/1/2023	2/2/2023	5/2/2023	8/1/2023	8/1/2023	11/8/2023	Missed	8/1/2023
Static Water Level (ft)				-	-	188.29	187.27	188.92	188.92	190.1	-	180.71
Sample Depth (ft)				-	-	190	188	190	190	191	-	183
Conductivity (µS/cm)				265.4	217.1	-	477.4	371.7	371.7	465.7	-	287.7
Water Temperature (C°)				12.7	10.9	14.2	18.1	13.8	13.8	14.6	-	16.1
pH				8.08	8.28	-	7.88	7.79	7.79	7.71	-	7.97
Analytes	Standards											
	MCL[1]	Trigger Level[2]	Secondary									
Phosphorus				0.002	0.004	0.003	0.003	0.002	0.002	0.002	-	0.011
SRP[3]				0.002	0.003	0.002	0.002	0.002	0.001	<0.001	-	0.003
Nitrate+Nitrite	10.00	5.00		1.06	0.86	2.30	0.05	2.04	-	3.35	-	1.26
Arsenic	0.01000	0.005		0.00319	0.00252	-	-	0.00159	-	-	-	0.00260
Lead[4]	0.015			<0.001	<0.001	-	-	<0.001	-	-	-	<0.001
Copper[4]	1.30000			<0.001	0.00163	-	-	<0.001	-	-	-	<0.001
Mercury	0.002	0.0004		<0.0002	<0.0002	-	-	<0.0002	-	-	-	<0.0002
Cadmium	0.005	0.005		<0.0002	<0.0002	-	-	<0.0002	-	-	-	<0.0002
Chromium	0.10000	0.02		<0.0015	<0.0015	-	-	<0.0015	-	-	-	0.00181
Fluoride	4.000	0.5	2.0	<0.1	<0.1	-	-	<0.1	-	-	-	0.119
Chloride		250	250	7.2	3.8	12.1	14.5	12.6	-	19.6	-	9.65
Sodium				3.53	3.40	-	-	11.00	-	-	-	5.48
Zinc		5.0	5.0	<0.005	<0.005	-	-	<0.005	-	-	-	0.0068
Magnesium				13.90	9.88	-	-	21.00	-	-	-	14.5
Potassium				1.75	1.64	-	-	3.27	-	-	-	1.92
Manganese		0.05	0.05	<0.001	<0.001	-	-	<0.001	-	-	-	0.00252
Calcium				28.0	25.1	-	-	36.5	-	-	-	31.4

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Hale's Ale Nested Site, east				Hale's Ale Nested Site, mid	Felts Field City monitoring well		ORCHARD AVE IRRIG DIST, Site 1			
WQMP Well ID				5311J05				5311J07	5312C01		5312H01			
SampleID/Comment				5311J05	5311J05	5311J05	5311J05	5311J07	5312C01	5312C01	5312H01	5312H01	5312H01	5312H01
Quarter				1	2	3	4	3	2	3	1	2	3	4
Sample Date				2/2/2023	5/2/2023	8/3/2023	11/8/2023	8/3/2023	5/2/2023	8/1/2023	1/24/2023	4/25/2023	7/25/2023	10/24/2023
Static Water Level (ft)				66.1	60.95	68.59	67	68.81	58.2	63.82	-	-	-	-
Sample Depth (ft)				67	64	70	68	106	69	69	-	-	-	-
Conductivity (µS/cm)				-	267.3	331.8	336.7	327.3	176.3	185.8	-	333.4	293.9	282.7
Water Temperature (C°)				11	12.2	13	11.1	12.4	14.4	14.1	-	10.6	10.9	18.2
pH				-	8.07	7.85	7.9	7.89	8.33	8.17	-	8.05	7.96	7.91
Analytes	Standards													
	MCL[1]	Trigger Level[2]	Secondary											
Phosphorus				0.003	0.006	0.003	0.003	0.005	-	0.014	0.010	0.014	0.015	0.006
SRP[3]				0.003	0.003	0.003	0.002	0.004	-	0.013	0.010	0.013	0.014	0.005
Nitrate+Nitrite	10.00	5.00		1.56	1.55	1.74	1.55	1.70	-	0.86	1.34	1.65	1.79	1.33
Arsenic	0.01000	0.005		-	-	0.00270	-	0.00264	**0.00607**	**0.00513**	-	**0.00509**	**0.00661**	-
Lead[4]	0.015			-	-	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	-
Copper[4]	1.30000			-	-	<0.001	-	<0.001	0.00132	<0.001	-	<0.001	<0.001	-
Mercury	0.002	0.0004		-	-	<0.0002	-	<0.0002	<0.0002	<0.0002	-	<0.0002	<0.0002	-
Cadmium	0.005	0.005		-	-	<0.0002	-	<0.0002	<0.0002	<0.0002	-	<0.0002	<0.0002	-
Chromium	0.10000	0.02		-	-	<0.0015	-	<0.0015	-	<0.0015	-	-	<0.0015	-
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-
Chloride		250	250	9.4	9.1	11.6	10.1	11.4	-	3.9	5.5	6.9	7.5	6.1
Sodium				-	-	5.02	-	4.96	-	3.40	-	-	4.58	-
Zinc		5.0	5.0	-	-	<0.005	-	0.0325	<0.005	<0.005	-	0.0168	0.0104	-
Magnesium				-	-	15.60	-	16.00	-	6.51	-	-	13.40	-
Potassium				-	-	2.17	-	2.23	-	1.30	-	-	2.11	-
Manganese		0.05	0.05	-	-	<0.001	-	<0.001	-	<0.001	-	-	<0.001	-
Calcium				-	-	36.8	-	36.9	-	24.0	-	-	38.7	-

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Orchard Ave Irrig Dist, Site 2 Buckeye & Dick			Plantes Ferry Park monitoring well	PASADENA PARK #2				Monitoring well Frederick & Bowdish	MODERN ELECT WATER, Site 6	MODERN ELECT WATER, Site 11
WQMP Well ID				5407C01			5404A01	5405K01				5409C02	5408N01	5415E03
SampleID/Comment				5407C01	5407C01	5407C01	5404A01	5405K01	5405K01	5405K01	5405K01	5409C02	5408N01	5415E03
Quarter				2	3	4	3	1	2	3	4	3	3	3
Sample Date				4/25/2023	7/25/2023	10/24/2023	8/4/2023	1/24/2023	4/25/2023	7/25/2023	10/24/2023	7/31/2023	7/25/2023	7/25/2023
Static Water Level (ft)				-	-	-	49.3	-	-	-	-	92.79	-	-
Sample Depth (ft)				-	-	-	111	-	-	-	-	94	-	-
Conductivity (µS/cm)				294.6	318.5	262.9	278.5	-	238.4	183.2	216.5	302.9	243.6	195.8
Water Temperature (C°)				18.5	19.5	11.2	13.8	-	10.2	10.9	10.2	11.9	12.2	12.4
pH				8.29	7.78	7.92	6.68	-	7.63	7.65	7.49	7.82	8.11	8.27
Analytes	Standards													
	MCL[1]	Trigger Level[2]	Secondary											
Phosphorus				0.011	0.010	0.010	0.317	0.007	0.008	0.009	0.005	0.005	0.006	0.008
SRP[3]				0.009	0.008	0.010	0.032	0.005	0.007	0.007	0.004	0.005	0.002	0.003
Nitrate+Nitrite	10.00	5.00		0.43	1.72	1.26	0.07	1.31	1.49	1.00	1.02	1.58	0.94	0.72
Arsenic	0.01000	0.005		-	0.00337	-	<0.001	0.00100	-	0.00195	-	0.00454	0.00390	0.00387
Lead[4]	0.015			-	<0.001	-	<0.001	-	-	<0.001	-	<0.001	<0.001	<0.001
Copper[4]	1.30000			-	0.00206	-	0.01410	-	-	0.00109	-	<0.001	0.00113	<0.001
Mercury	0.002	0.0004		-	<0.0002	-	<0.0002	-	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Cadmium	0.005	0.005		-	<0.0002	-	<0.0002	-	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Chromium	0.10000	0.02		-	<0.0015	-	<0.0015	-	-	<0.0015	-	<0.0015	<0.0015	<0.0015
Fluoride	4.000	0.5	2.0	-	<0.1	-	0.253	-	-	<0.1	-	<0.1	<0.1	<0.1
Chloride		250	250	6.1	8.2	5.4	1.95	4.8	5.8	4.6	4.4	6.7	5.1	4.2
Sodium				-	4.90	-	9.82	-	-	3.71	-	4.27	3.10	2.83
Zinc		5.0	5.0	-	0.0065	-	0.2110	-	-	<0.005	-	<0.005	<0.005	<0.005
Magnesium				-	15.60	-	12.10	-	-	7.33	-	13.90	12.60	9.94
Potassium				-	2.14	-	5.60	-	-	1.96	-	1.95	1.68	1.47
Manganese		0.05	0.05	-	<0.001	-	**0.3080**	-	-	<0.001	-	0.0175	<0.001	<0.001
Calcium				-	40.6	-	22.9	-	-	23.0	-	37.1	30.5	23.9

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				East Valley High School monitoring well				Monitoring well at SCC							
WQMP Well ID				6436N01				5310Q01							
SampleID/Comment				6436N01	6436N01	6436N01	6436N01	5310Q01	5310Q01a	5310Q01	5310Q01a	5310Q01	5310Q01a	5310Q01	5310Q01a
Quarter				1	2	3	4	1	1	2	2	3	3	4	4
Sample Date				1/31/2023	5/2/2023	8/4/2023	11/9/2023	2/2/2023	2/2/2023	5/2/2023	5/2/2023	7/31/2023	7/31/2023	11/8/2023	11/8/2023
Static Water Level (ft)				115.16	112.18	118.85	117.27	38.26	38.26	32.6	32.6	40.64	40.64	39.02	39.02
Sample Depth (ft)				117	113	120	119	41	41	42	42	42	42	41	41
Conductivity (µS/cm)				-	569	636	687	-	-	233.2	233.2	197.4	197.4	189.4	189.4
Water Temperature (C°)				13.1	17.7	14.3	13.6	13.4	13.4	13.8	13.8	13.8	13.8	12.9	12.9
pH				-	7.65	7.47	7.44	-	-	8.42	8.42	8.23	8.23	8.27	8.27
Analytes	Standards														
	MCL[1]	Trigger Level[2]	Secondary												
Phosphorus				0.039	0.036	0.062	0.042	0.003	0.003	0.003	0.004	0.004	0.004	0.003	0.002
SRP[3]				0.039	0.036	0.041	0.040	0.003	0.003	0.002	0.002	0.004	0.003	<0.001	<0.001
Nitrate+Nitrite	10.00	5.00		**5.49**	3.93	**6.49**	**5.22**	0.74	0.75	0.77	0.78	0.73	0.73	0.66	0.65
Arsenic	0.01000	0.005		-	-	0.00289	-	-	-	-	-	0.00311	0.00319	-	-
Lead[4]	0.015			-	-	0.00155	-	-	-	-	-	<0.001	<0.001	-	-
Copper[4]	1.30000			-	-	0.00217	-	-	-	-	-	<0.001	<0.001	-	-
Mercury	0.002	0.0004		-	-	<0.0002	-	-	-	-	-	<0.0002	<0.0002	-	-
Cadmium	0.005	0.005		-	-	<0.0002	-	-	-	-	-	<0.0002	<0.0002	-	-
Chromium	0.10000	0.02		-	-	0.00580	-	-	-	-	-	<0.0015	<0.0015	-	-
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-
Chloride		250	250	19.4	20.2	49.2	39.1	6.6	6.7	6.9	6.9	6.7	6.7	5.7	5.7
Sodium				-	-	9.36	-	-	-	-	-	3.21	3.23	-	-
Zinc		5.0	5.0	-	-	0.0065	-	-	-	-	-	<0.005	<0.005	-	-
Magnesium				-	-	29.70	-	-	-	-	-	8.00	8.08	-	-
Potassium				-	-	4.43	-	-	-	-	-	1.39	1.41	-	-
Manganese		0.05	0.05	-	-	0.0204	-	-	-	-	-	0.0146	0.0162	-	-
Calcium				-	-	70.5	-	-	-	-	-	24.0	24.2	-	-

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Olive & Fiske monitoring well				Third & Havana Nested Site, east				Third & Havana Nested Site, mid
WQMP Well ID				5315L01				5322A01				5322A03
SampleID/Comment				5315L01	5315L01	5315L01	5315L01	5322A01	5322A01	5322A01	5322A01	5322A03
Quarter				1	2	3	4	1	2	3	4	3
Sample Date				2/2/2023	5/2/2023	7/31/2023	11/8/2023	2/2/2023	5/2/2023	7/31/2023	11/8/2023	7/31/2023
Static Water Level (ft)				67.66	63.67	70.34	68.9	50.2	46.33	52.92	51.49	53.03
Sample Depth (ft)				69	69	72	70	51	48	54	53	91
Conductivity (µS/cm)				-	259.4	227.3	228.3	-	313.5	259.6	273.6	265.1
Water Temperature (C°)				12.8	14.1	14.4	12.6	12.4	14.2	14.4	12.7	14.1
pH				-	8.29	8.1	8.13	-	8.01	7.89	7.87	7.96
Analytes	Standards											
	MCL[1]	Trigger Level[2]	Secondary									
Phosphorus				0.005	0.004	0.005	0.003	0.006	0.008	0.007	0.005	0.007
SRP[3]				0.003	0.002	0.004	0.001	0.005	0.006	0.006	0.003	0.007
Nitrate+Nitrite	10.00	5.00		0.84	0.87	0.87	0.79	1.19	3.33	1.21	1.11	1.28
Arsenic	0.01000	0.005		-	-	0.00247	-	-	-	0.00243	-	0.00271
Lead[4]	0.015			-	-	<0.001	-	-	-	<0.001	-	<0.001
Copper[4]	1.30000			-	-	<0.001	-	-	-	<0.001	-	<0.001
Mercury	0.002	0.0004		-	-	<0.0002	-	-	-	<0.0002	-	<0.0002
Cadmium	0.005	0.005		-	-	<0.0002	-	-	-	<0.0002	-	<0.0002
Chromium	0.10000	0.02		-	-	<0.0015	-	-	-	<0.0015	-	<0.0015
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	-	-	<0.1	-	<0.1
Chloride		250	250	12.2	120*	9.3	6.8	14.4	15.9	9.5	10.1	10.3
Sodium				-	-	3.80	-	-	-	4.76	-	5.07
Zinc		5.0	5.0	-	-	<0.005	-	-	-	<0.005	-	<0.005
Magnesium				-	-	9.20	-	-	-	10.40	-	10.50
Potassium				-	-	1.52	-	-	-	1.71	-	1.74
Manganese		0.05	0.05	-	-	<0.001	-	-	-	<0.001	-	<0.001
Calcium				-	-	27.0	-	-	-	32.0	-	32.1

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				6th & Havana monitoring well (MW2)				CITY of SPOKANE-Ray				E. SPOKANE WTR DIST, Site 1			
WQMP Well ID				5323E01				5322F01				5324G01			
SampleID/Comment				5323E01	5323E01	5323E01	5323E01	5322F01	5322F01	5322F01	5322F01	5324G01	5324G01	5324G01	5324G01
Quarter				1	2	3	4	1	2	3	4	1	2	3	4
Sample Date				2/2/2023	5/2/2023	7/31/2023	11/8/2023	1/24/2023	4/25/2023	7/25/2023	10/24/2023	1/24/2023	4/25/2023	7/25/2023	11/9/2023
Static Water Level (ft)				50.78	47	53.46	52.5	-	-	-	-	-	-	-	-
Sample Depth (ft)				52	48	55	54	-	-	-	-	-	-	-	-
Conductivity (µS/cm)				-	365.8	400	388.7	-	508.1	425.1	486.7	-	628.1	303.3	467.1
Water Temperature (C°)				12.3	14.2	14.4	12.7	-	11.8	12.4	11.7	19.9	11.1	13.4	11
pH				-	7.93	7.67	7.72	-	7.63	7.67	7.46	2.73	7.71	7.85	7.66
Analytes	Standards														
	MCL[1]	Trigger Level[2]	Secondary												
Phosphorus				0.009	0.010	0.011	0.007	0.021	0.019	0.019	0.017	0.016	0.018	0.009	0.016
SRP[3]				0.009	0.009	0.011	0.007	0.020	0.019	0.018	0.017	0.015	0.018	0.007	0.016
Nitrate+Nitrite	10.00	5.00		2.19	1.74	2.44	2.27	3.15	3.33	2.50	3.44	-	2.98	1.50	2.82
Arsenic	0.01000	0.005		-	-	0.00336	-	-	-	0.00395	-	-	-	0.00439	-
Lead[4]	0.015			-	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	-
Copper[4]	1.30000			-	-	<0.001	-	-	-	0.00392	-	-	-	0.00142	-
Mercury	0.002	0.0004		-	-	<0.0002	-	-	-	<0.0002	-	-	-	<0.0002	-
Cadmium	0.005	0.005		-	-	<0.0002	-	-	-	<0.0002	-	-	-	<0.0002	-
Chromium	0.10000	0.02		-	-	<0.0015	-	-	-	<0.0015	-	-	-	<0.0015	-
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	-
Chloride		250	250	18.4	14.2	22.0	18.9	30.1	15.9	23.9	29.8	-	24.1	11.4	20.8
Sodium				-	-	8.56	-	-	-	10.30	-	-	-	5.53	-
Zinc		5.0	5.0	-	-	<0.005	-	-	-	<0.005	-	-	-	0.0052	-
Magnesium				-	-	16.20	-	-	-	17.10	-	-	-	13.30	-
Potassium				-	-	2.57	-	-	-	2.70	-	-	-	2.04	-
Manganese		0.05	0.05	-	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	-
Calcium				-	-	48.8	-	-	-	53.0	-	-	-	37.1	-

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Sullivan Road and Krispy Kreme, monitoring well				Sullivan Park South, monitoring well					Springs at Sullivan Park	New Balfour Park monitoring well
WQMP Well ID				5411R06				5411R03					5411R05s	5417R02
SampleID/Comment				5411R06	5411R06	5411R06	5411R06	5411R03	5411R03	5411R03	5411R03a	5411R03	5411R05s	5417R02
Quarter				1	2	3	4	1	2	3	3	4	3	1
Sample Date				1/31/2023	5/10/2023	8/4/2023	11/9/2023	1/31/2023	5/2/2023	8/4/2023	8/4/2023	11/9/2023	8/4/2023	1/31/2023
Static Water Level (ft)				49.38	40.65	52.71	50.52	32.56	24.91	36.02	36.02	33.31	-	70.9
Sample Depth (ft)				51	42	54	52	34	28	37	37	35	-	72
Conductivity (µS/cm)				-	82.1	219.8	259.8	-	258.1	244.5	244.5	260.6	212.2	-
Water Temperature (C°)				11	10.9	11.3	11.7	8.6	12	13.7	13.7	11.7	12.3	13.4
pH				-	8.5	8.03	7.98	-	8.25	7.99	7.99	7.95	7.92	-
Analytes	Standards													
	MCL[1]	Trigger Level[2]	Secondary											
Phosphorus				0.006	0.004	0.004	0.003	0.006	0.005	0.004	0.004	0.003	0.005	0.008
SRP[3]				0.003	0.002	0.004	0.002	0.003	0.003	0.004	0.003	0.003	0.003	0.005
Nitrate+Nitrite	10.00	5.00		1.06	0.09	1.02	1.02	1.03	0.92	0.95	2.16	1.10	0.93	0.78
Arsenic	0.01000	0.005		-	-	0.00204	-	-	-	0.00256	0.00109	-	0.00273	-
Lead[4]	0.015			-	-	<0.001	-	-	-	<0.001	<0.001	-	<0.001	-
Copper[4]	1.30000			-	-	<0.001	-	-	-	<0.001	<0.001	-	<0.001	-
Mercury	0.002	0.0004		-	-	<0.0002	-	-	-	<0.0002	<0.0002	-	<0.0002	-
Cadmium	0.005	0.005		-	-	<0.0002	-	-	-	<0.0002	<0.0002	-	<0.0002	-
Chromium	0.10000	0.02		-	-	<0.0015	-	-	-	<0.0015	<0.0015	-	<0.0015	-
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	-	-	<0.1	<0.1	-	<0.1	-
Chloride		250	250	5.0	2.7	3.8	3.7	3.3	3.6	3.4	3.4	3.6	3.4	9.4
Sodium				-	-	2.79	-	-	-	2.79	2.78	-	2.84	-
Zinc		5.0	5.0	-	-	<0.005	-	-	-	<0.005	<0.005	-	<0.005	-
Magnesium				-	-	11.30	-	-	-	10.70	10.90	-	11.00	-
Potassium				-	-	1.64	-	-	-	1.80	1.78	-	1.87	-
Manganese		0.05	0.05	-	-	<0.001	-	-	-	<0.001	<0.001	-	<0.001	-
Calcium				-	-	27.3	-	-	-	27.1	27.0	-	27.2	-

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Spokane Co Water Dist #3, Site 25, 26th & Vercler							
WQMP Well ID				5427L01							
SampleID/Comment				5427L01	5427L01a	5427L01	5427L01a	5427L01	5427L01a	5427L01	5427L01a
Quarter				1	1	2	2	3	3	4	4
Sample Date				1/24/2023	1/24/2023	4/25/2023	4/25/2023	7/25/2023	7/25/2023	10/24/2023	10/24/2023
Static Water Level (ft)				-	-	-	0	-	-	-	-
Sample Depth (ft)				-	-	-	0	-	-	-	-
Conductivity (µS/cm)				-	-	425.4	425.4	409.4	409.4	387.3	387.3
Water Temperature (C°)				-	-	11.4	11.4	11.5	11.5	11	11
pH				-	-	7.86	7.86	7.74	7.74	7.77	7.77
Analytes	Standards										
	MCL[1]	Trigger Level[2]	Secondary								
Phosphorus				0.004	0.004	0.009	0.006	0.008	0.008	0.005	0.004
SRP[3]				0.004	0.003	0.006	0.006	0.008	0.006	0.003	0.002
Nitrate+Nitrite	10.00	5.00		1.91	1.87	1.86	1.86	2.28	2.33	1.85	1.83
Arsenic	0.01000	0.005		-	-	-	-	0.00458	0.00469	-	-
Lead[4]	0.015			-	-	-	-	<0.001	<0.001	-	-
Copper[4]	1.30000			-	-	-	-	0.00171	0.00168	-	-
Mercury	0.002	0.0004		-	-	-	-	<0.0002	<0.0002	-	-
Cadmium	0.005	0.005		-	-	-	-	<0.0002	<0.0002	-	-
Chromium	0.10000	0.02		-	-	-	-	<0.0015	<0.0015	-	-
Fluoride	4.000	0.5	2.0	-	-	-	-	<0.1	<0.1	-	-
Chloride		250	250	11.9	11.9	11.6	11.4	12.8	12.4	11.3	11.2
Sodium				-	-	-	-	7.40	7.55	-	-
Zinc		5.0	5.0	-	-	-	-	<0.005	<0.005	-	-
Magnesium				-	-	-	-	19.50	19.70	-	-
Potassium				-	-	-	-	2.75	2.83	-	-
Manganese		0.05	0.05	-	-	-	-	<0.001	<0.001	-	-
Calcium				-	-	-	-	53.6	54.7	-	-

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				VERA WATER & POWER, New Well 4				Mission Well, LIBERTY LAKE SEWER DIST	CONSOLIDATED IRRIG DIST 19, Site 2A	Mission & Barker monitoring well at CID 4	
WQMP Well ID				5426L03				5515C01	5518R01	5517D05	
SampleID/Comment				5426L03	5426L03	5426L03	5426L03	5515C01	5518R01	5517D05	5517D05
Quarter				1	2	3	4	3	3	2	3
Sample Date				1/24/2023	4/25/2023	7/25/2023	10/24/2023	7/25/2023	7/25/2023	5/10/2023	8/3/2023
Static Water Level (ft)				-	-	-	-	-	-	78.42	87.42
Sample Depth (ft)				-	-	-	-	-	-	85	89
Conductivity (µS/cm)				-	516.1	436.1	455.7	297.9	150.9	112.1	89.7
Water Temperature (C°)				-	11.1	11.5	11.1	14.3	13	15.3	14.4
pH				-	7.71	7.7	7.61	7.8	8.52	7.49	7.19
Analytes	Standards										
	MCL[1]	Trigger Level[2]	Secondary								
Phosphorus				0.007	0.008	0.010	0.006	0.012	0.007	-	0.003
SRP[3]				0.007	0.006	0.008	0.005	0.011	0.003	-	0.003
Nitrate+Nitrite	10.00	5.00		2.88	2.82	2.73	2.64	1.33	0.57	-	0.34
Arsenic	0.01000	0.005		-	-	0.00494	-	0.00327	0.00156	<0.001	<0.001
Lead[4]	0.015			-	-	<0.001	-	<0.001	<0.001	<0.001	<0.001
Copper[4]	1.30000			-	-	0.00119	-	0.00263	<0.001	<0.001	<0.001
Mercury	0.002	0.0004		-	-	<0.0002	-	<0.0002	<0.0002	<0.0002	<0.0002
Cadmium	0.005	0.005		-	-	<0.0002	-	<0.0002	<0.0002	<0.0002	<0.0002
Chromium	0.10000	0.02		-	-	<0.0015	-	<0.0015	<0.0015	-	<0.0015
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	<0.1	<0.1	-	<0.1
Chloride		250	250	14.8	15.0	13.9	14.2	7.2	5.9	-	2.6
Sodium				-	-	8.85	-	5.11	2.81	-	2.31
Zinc		5.0	5.0	-	-	0.0094	-	<0.005	<0.005	<0.005	<0.005
Magnesium				-	-	18.10	-	13.30	5.25	-	3.15
Potassium				-	-	3.32	-	2.07	1.13	-	0.94
Manganese		0.05	0.05	-	-	<0.001	-	<0.001	<0.001	-	<0.001
Calcium				-	-	63.2	-	38.8	20.6	-	10.0

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Euclid & Barker monitoring well at CID5						Trent & Barker Road, monitoring well			
WQMP Well ID				5507A04						5505D01			
SampleID/Comment				5507A04	5507A04a	5507A04	5507A04a	5507A04	5507A04a	5505D01	5505D01	5505D01	5505D01
Quarter				1	1	2	2	4	4	1	2	3	4
Sample Date				1/31/2023	1/31/2023	5/10/2023	5/10/2023	11/9/2023	11/9/2023	Missed	Missed	Missed	Missed
Static Water Level (ft)				69.77	69.77	63.92	63.92	71.75	71.75	---	---	---	---
Sample Depth (ft)				71	71	69.5	69.5	74	74	---	---	---	---
Conductivity (µS/cm)				-	-	373.4	373.4	349.1	349.1	---	---	---	---
Water Temperature (C°)				9.7	9.7	11.6	11.6	10.2	10.2	---	---	---	---
pH				-	-	7.97	7.97	7.78	7.78	---	---	---	---
Analytes	Standards												
	MCL[1]	Trigger Level[2]	Secondary										
Phosphorus				0.002	0.002	0.005	0.005	<0.002	<0.002				
SRP[3]				0.001	0.001	0.003	0.003	<0.001	<0.001				
Nitrate+Nitrite	10.00	5.00		1.52	1.53	1.58	1.59	1.39	1.40				
Arsenic	0.01000	0.005		-	-	0.00190	0.00195	-	-	---	---	---	---
Lead[4]	0.015			-	-	<0.001	<0.001	-	-	---	---	---	---
Copper[4]	1.30000			-	-	0.00321	<0.001	-	-	---	---	---	---
Mercury	0.002	0.0004		-	-	<0.0002	<0.0002	-	-	---	---	---	---
Cadmium	0.005	0.005		-	-	<0.0002	<0.0002	-	-	---	---	---	---
Chromium	0.10000	0.02		-	-	-	-	-	-	---	---	---	---
Fluoride	4.000	0.5	2.0	-	-	-	-	-	-	---	---	---	---
Chloride		250	250	3.5	3.5	4.0	4.0	3.6	3.6	---	---	---	---
Sodium				-	-	-	-	-	-	---	---	---	---
Zinc		5.0	5.0	-	-	<0.005	<0.005	-	-	---	---	---	---
Magnesium				-	-	-	-	-	-	---	---	---	---
Potassium				-	-	-	-	-	-	---	---	---	---
Manganese		0.05	0.05	-	-	-	-	-	-	---	---	---	---
Calcium				-	-	-	-	-	-	---	---	---	---

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Barker Road north of river, monitoring well		Barker Road Centennial Trail North, monitoring well		Barker Road Centennial Trail South, monitoring well		CONSOLIDATED IRRIG DIST 19, Site 11B
WQMP Well ID				5507H01		5508M01		5508M02		6631M04
SampleID/Comment				5507H01	5507H01	5508M01	5508M01	5508M02	5508M02	6331M04
Quarter				2	3	2	3	2	3	3
Sample Date				5/10/2023	8/3/2023	5/10/2023	8/3/2023	5/10/2023	8/3/2023	8/3/2023
Static Water Level (ft)				41.09	51.21	60.48	69.79	61.61	70.74	-
Sample Depth (ft)				42	53	62	71	63	72	-
Conductivity (µS/cm)				82.5	62	63.4	63.6	62.8	62.8	224.7
Water Temperature (C°)				9.4	24.8	9.2	22.4	10	19	13.4
pH				6.92	6.64	7.19	6.71	7.1	6.79	8.09
Analytes	Standards			-	-	-	-	-	-	
	MCL[1]	Trigger Level[2]	Secondary	-	-	-	-	-	-	
Phosphorus				-	0.013	-	0.011	-	0.010	0.005
SRP[3]				-	0.013	-	0.011	-	0.010	0.004
Nitrate+Nitrite	10.00	5.00		-	0.32	-	0.30	-	0.35	1.03
Arsenic	0.01000	0.005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.00464
Lead[4]	0.015			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper[4]	1.30000			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury	0.002	0.0004		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Cadmium	0.005	0.005		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chromium	0.10000	0.02		-	<0.0015	-	<0.0015	-	<0.0015	<0.0015
Fluoride	4.000	0.5	2.0	-	<0.1	-	<0.1	-	<0.1	<0.1
Chloride		250	250	-	2.8	-	2.7	-	2.6	5.8
Sodium				-	2.78	-	2.87	-	2.63	2.83
Zinc		5.0	5.0	0.0054	0.0138	0.0256	0.0164	0.0115	0.0087	<0.005
Magnesium				-	1.70	-	1.65	-	1.60	11.10
Potassium				-	0.92	-	0.97	-	0.81	1.96
Manganese		0.05	0.05	-	0.00189	-	<0.001	-	<0.001	<0.001
Calcium				-	5.5	-	6.0	-	5.7	24.7

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Idaho Road East Farms monitoring well at CID11				Idaho Road 300 ft south of pipeline, monitoring well				Idaho Road 1000 ft south of Trent, monitoring well				
WQMP Well ID				6631M07				6525R01				6524R01				
SampleID/Comment				6631M07	6631M07	6331M07	6631M07	6525R01	6525R01	6525R01	6525R01	6524R01	6524R01	6524R01	6524R01a	6524R01
Quarter				1	2	3	4	1	2	3	4	1	2	3	3	4
Sample Date				1/31/2023	5/10/2023	8/3/2023	11/9/2023	1/31/2023	5/10/2023	8/3/2023	11/9/2023	1/31/2023	5/10/2023	8/3/2023	8/3/2023	11/9/2023
Static Water Level (ft)				115.35	111.63	117.72	117.28	104.45	101.25	106.81	106.55	126.36	123.62	128.68	128.68	128.57
Sample Depth (ft)				117	113	119	119	106	102	108	108	128	125	130	130	130
Conductivity (µS/cm)				-	270.6	243.5	247	-	347.8	316.2	325.7	-	373.6	325.7	325.7	331.9
Water Temperature (C°)				14	16	15.9	14.7	9.9	11.5	12	10.8	10.4	12.7	12.6	12.6	11.2
pH				-	8.23	7.95	8.03	-	8.08	7.9	7.86	-	7.91	7.76	7.76	7.79
Analytes	Standards															
	MCL[1]	Trigger Level[2]	Secondary													
Phosphorus				0.004	0.005	0.005	0.006	0.004	0.005	0.002	0.004	0.004	0.005	0.003	0.004	<0.002
SRP[3]				0.003	0.004	0.004	0.002	0.001	0.004	0.002	<0.001	0.002	0.004	0.003	0.003	0.001
Nitrate+Nitrite	10.00	5.00		0.97	1.13	1.16	1.11	0.88	0.88	1.00	0.87	1.96	2.41	2.02	2.07	1.91
Arsenic	0.01000	0.005		-	-	0.00473	-	-	-	0.00178	-	-	-	0.00233	0.00227	-
Lead[4]	0.015			-	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	<0.001	-
Copper[4]	1.30000			-	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	<0.001	-
Mercury	0.002	0.0004		-	-	<0.0002	-	-	-	<0.0002	-	-	-	<0.0002	<0.0002	-
Cadmium	0.005	0.005		-	-	<0.0002	-	-	-	<0.0002	-	-	-	<0.0002	<0.0002	-
Chromium	0.10000	0.02		-	-	<0.0015	-	-	-	<0.0015	-	-	-	<0.0015	<0.0015	-
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	-
Chloride		250	250	5.8	6.1	6.0	6.0	2.4	3.2	2.5	2.4	5.6	5.9	5.0	5.0	5.3
Sodium				-	-	2.84	-	-	-	3.00	-	-	-	3.40	3.53	-
Zinc		5.0	5.0	-	-	<0.005	-	-	-	<0.005	-	-	-	<0.005	<0.005	-
Magnesium				-	-	11.60	-	-	-	16.50	-	-	-	15.10	15.40	-
Potassium				-	-	1.98	-	-	-	1.89	-	-	-	2.07	2.12	-
Manganese		0.05	0.05	-	-	<0.001	-	-	-	<0.001	-	-	-	<0.001	<0.001	-
Calcium				-	-	26.4	-	-	-	34.8	-	-	-	37.9	39.2	-

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Three Springs				SPOKANE FISH HATCHERY, GRIFFITH SPR				Spokane Fish Hatchery well
WQMP Well ID				5212F01s				6211J01S				6211K01
SampleID/Comment				5212F01s	5212F01s	5212F01s	5212F01s	6211J01s	6211J01s	6211J01s	6211J01s	6211K01
Quarter				1	2	3	4	1	2	3	4	3
Sample Date				1/24/2023	4/25/2023	7/31/2023	10/24/2023	1/24/2023	4/25/2023	8/1/2023	10/24/2023	8/1/2023
Static Water Level (ft)				-	-	-	-	-	-	-	-	-
Sample Depth (ft)				-	-	-	-	-	-	-	-	-
Conductivity (µS/cm)				-	355.7	-	344.2	-	376.4	329.6	337.9	298.8
Water Temperature (C°)				-	11.5	-	11.5	-	11.3	11.4	11.2	12.1
pH				-	8.1	-	7.97	-	8.11	7.99	8	8.05
Analytes	Standards											
	MCL[1]	Trigger Level[2]	Secondary									
Phosphorus				0.004	0.006	0.005	0.003	0.005	0.010	0.005	0.005	0.004
SRP[3]				0.003	0.005	0.004	0.001	0.003	0.005	0.004	0.004	0.003
Nitrate+Nitrite	10.00	5.00		2.00	1.98	1.83	2.39	1.52	1.53	1.54	1.46	1.33
Arsenic	0.01000	0.005		-	-	0.00337	-	-	-	0.00286	-	0.00330
Lead[4]	0.015			-	-	<0.001	-	-	-	<0.001	-	<0.001
Copper[4]	1.30000			-	-	<0.001	-	-	-	<0.001	-	<0.001
Mercury	0.002	0.0004		-	-	<0.0002	-	-	-	<0.0002	-	<0.0002
Cadmium	0.005	0.005		-	-	<0.0002	-	-	-	<0.0002	-	<0.0002
Chromium	0.10000	0.02		-	-	<0.0015	-	-	-	<0.0015	-	<0.0015
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	-	-	0.119	-	<0.1
Chloride		250	250	12.7	13.8	16.3	16.4	11.5	11.8	11.3	12.1	9.7
Sodium				-	-	6.48	-	-	-	4.90	-	4.05
Zinc		5.0	5.0	-	-	<0.005	-	-	-	<0.005	-	<0.005
Magnesium				-	-	12.80	-	-	-	18.40	-	16.20
Potassium				-	-	2.04	-	-	-	2.34	-	2.02
Manganese		0.05	0.05	-	-	<0.001	-	-	-	<0.001	-	<0.001
Calcium				-	-	36.1	-	-	-	35.0	-	30.7

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Waikiki Springs				Waikiki Springs New Location			
WQMP Well ID				6306P01s				6306P01s2			
SampleID/Comment				6306P01s	6306P01s	6306P01s	6306P01s	6306P01s2	6306P01s2	6306P01s2	6306P01s2
Quarter				1	2	3	4	1	2	3	4
Sample Date				1/24/2023	4/25/2023	8/1/2023	10/24/2023	1/24/2023	4/25/2023	8/1/2023	10/24/2023
Static Water Level (ft)				-	-	-	-	-	-	-	-
Sample Depth (ft)				-	-	-	-	-	-	-	-
Conductivity (µS/cm)				-	374.8	335.2	358.7	-	369.1	318.8	340.8
Water Temperature (C°)				-	10.8	10.9	10.7	-	11	11.2	10.5
pH				-	8.18	8.01	8.07	-	8.38	8.21	8.23
Analytes	Standards										
	MCL[1]	Trigger Level[2]	Secondary								
Phosphorus				0.004	0.003	0.003	0.002	0.004	0.004	0.002	0.003
SRP[3]				0.002	0.003	0.002	<0.001	0.002	0.003	0.002	0.003
Nitrate+Nitrite	10.00	5.00		2.88	2.94	3.05	3.45	1.94	1.99	2.07	2.03
Arsenic	0.01000	0.005		-	-	0.00205	-	-	-	0.00239	-
Lead[4]	0.015			-	-	<0.001	-	-	-	<0.001	-
Copper[4]	1.30000			-	-	<0.001	-	-	-	<0.001	-
Mercury	0.002	0.0004		-	-	<0.0002	-	-	-	<0.0002	-
Cadmium	0.005	0.005		-	-	<0.0002	-	-	-	<0.0002	-
Chromium	0.10000	0.02		-	-	<0.0015	-	-	-	<0.0015	-
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	-	-	<0.1	-
Chloride		250	250	14.0	17.7	15.4	17.9	8.0	9.5	9.9	10.2
Sodium				-	-	6.57	-	-	-	4.78	-
Zinc		5.0	5.0	-	-	<0.005	-	-	-	<0.005	-
Magnesium				-	-	22.30	-	-	-	19.20	-
Potassium				-	-	2.42	-	-	-	2.31	-
Manganese		0.05	0.05	-	-	<0.001	-	-	-	<0.001	-
Calcium				-	-	36.4	-	-	-	32.3	-

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

Spokane County Water Resources - Spokane Valley Rathdrum Prairie Aquifer Monitoring
2023 Quarterly Results

Well Name				Blank				Equipment Blank			
WQMP Well ID				Blank				Equipment Blank			
SampleID/Comment				BLANK	BLANK	BLANK	BLANK	EQUIP BLANK	EQUIP BLANK	EQUIP BLANK	EQUIP BLANK
Quarter				1	2	3	4	1	2	3	4
Sample Date				2/2/23	5/10/23	7/31/23	11/8/23	2/2/23	5/10/23	7/31/23	11/8/23
Static Water Level (ft)				-	-	-	-	-	-	-	-
Sample Depth (ft)				-	-	-	-	-	-	-	-
Conductivity (µS/cm)				-	-	-	-	-	-	-	-
Water Temperature (C°)				-	-	-	-	-	-	-	-
pH				-	-	-	-	-	-	-	-
Analytes	Standards										
	MCL[1]	Trigger Level[2]	Secondary								
Phosphorus				<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
SRP[3]				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrate+Nitrite	10.00	5.00		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.01000	0.005		-	<0.001	<0.001	-	-	<0.001	<0.001	-
Lead[4]	0.015			-	<0.001	<0.001	-	-	<0.001	<0.001	-
Copper[4]	1.30000			-	<0.001	<0.001	-	-	<0.001	<0.001	-
Mercury	0.002	0.0004		-	<0.0002	<0.0002	-	-	<0.0002	<0.0002	-
Cadmium	0.005	0.005		-	<0.0002	<0.0002	-	-	<0.0002	<0.0002	-
Chromium	0.10000	0.02		-	-	<0.0015	-	-	-	<0.0015	-
Fluoride	4.000	0.5	2.0	-	-	<0.1	-	-	-	<0.1	-
Chloride		250	250	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sodium				-	-	<0.5	-	-	-	<0.5	-
Zinc		5.0	5.0	-	<0.005	<0.005	-	-	<0.005	<0.005	-
Magnesium				-	-	<0.5	-	-	-	<0.5	-
Potassium				-	-	<0.5	-	-	-	<0.5	-
Manganese		0.05	0.05	-	-	<0.001	-	-	-	<0.001	-
Calcium				-	-	<0.1	-	-	-	<0.1	-

All results reported in mg/lL(ppm)

1 Maximum Contaminent Levels

2 Trigger level identified by WA Dept of Health

Results above the trigger level are in **red.**

3 Soluble Reactive Phosphorus

4 Federal Action Levels established for distribution systems.

APPENDIX B: 2023 Sampling Schedule, Missed Locations and Missed Samples.
Sample scheme by Site, Quarter and Parameter. Missing samples are in **BOLD RED**. This does not include duplicates or blanks.

	QTR1				QTR4				QTR2										QTR3														
Site	Cl	N	TP	SRP	Cl	N	TP	SRP	Cl	N	TP	SRP	As	Cd	Cu	Pb	Hg	Zn	Cl	N	TP	SRP	As	Cd	Cu	Pb	Hg	Zn	Ca	Cr	Mg	Mn	K	Na	TOTAL
5322F01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5324G01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5312H01	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	34
5407C01	**0**	**0**	**0**	**0**	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
5405K01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5427L01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5426L03	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
6306P01s	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
6306P01s2	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
6211J01s	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5212F01s	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5417R02	1	1	1	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**							**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	4
6631M07	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
6525R01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
6524R01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5505D01	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5507A04	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	18
6436N01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5411R03	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5411R06	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5311J05	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5322A01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5323E01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5315L01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5310Q01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5308H01	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
6327N04	1	1	1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
5312C01													1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
5507H01													1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
5508M01													1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
5508M02													1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
5517D05													1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
5308A02																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5213B01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5408N01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5415E03																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5518R01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5515C01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
6328H01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
6320D01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
6331M04																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5307M01																			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5304G01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
6330J01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
6331J01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
6211K01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5311J07																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5322A03																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5409C02																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5404A01																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5441R05s																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
																																		1094
																																	of	1182
																																		92.6 percent

APPENDIX C: Data Quality Assurance/Quality Control

HOLDING TIME CHECK

Sampling Round (QTR/YR): 1/2023

			Sample Date	1/24/2023	Sample Date	1/31/2023	Sample Date	2/2/2023
Analyte	Holding Time	HT in days	Analysis Date	Within HT	Analysis Date	Within HT	Analysis Date	Within HT
Arsenic	6 months	180						
Cadmium	6 months	180						
Calcium	6 months	180						
Chloride	28 days	28	1/26/2023	Yes	2/2/2023	Yes	2/6/2023	Yes
Chromium	6 months	180						
Copper	6 months	180						
Flouride	28 days	28						
Lead	6 months	180						
Magnesium	6 months	180						
Manganese	6 months	180						
Mercury	28 days	28						
Nitrate/Nitrite as N	28 days	28	2/7/2023	Yes	2/9/2023	Yes	2/14/2023	Yes
Potassium	6 months	180						
Sodium	6 months	180						
Zinc	6 months	180						
Total Phosphorus	28 days	28	1/30/2023	Yes	2/6/2023	Yes	2/14/2023	Yes
SRP	48 hours	2	1/25/2023	Yes	2/2/2023	Yes	2/3/2023	Yes

Sampling Round: 1/2023 **Sample Date: 1/24/2023**
Laboratory Work Order: 1737350 & X3A0304

FIELD DUPLICATE ASSESSMENT

5427L01	Sample Result	Field Duplicate Result	RPD	MRL	Case	Qualifier
Phosphorus	0.004	0.004	0.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.004	0.003	28.57	0.001	C	no qualifier
Chloride	11.9	11.9	0.00	0.20	D	no qualifier
Nitrate/Nitrite as N	1.91	1.87	2.12	0.050	D	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<0.002	103.2%	0.23%	98.77%	2.10%	0.002	0.002
Soluble reactive phosphorous	<0.001	105.1%	2.90%	98.55%	10.20%	0.001	0.001
Chloride	<.20	101.0%	0.7%	101.00%		0.02	0.20
Nitrate/Nitrite as N	<.050	99.3%	0.2%	126.00%		0.040	0.050

Acceptance Limits	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Bromide	<MRL	90% to 110%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Chloride	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	J+	

Sampling Round: 1/2023 Sample Date: 01/31/2023
Laboratory Work Order: 1737509 & X3B0014

FIELD DUPLICATE ASSESSMENT

5507A04	Sample Result	Field Duplicate Result	RPD	MRL	Case	Qualifier
Phosphorus	0.002	0.002	0.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.001	0.001	0.00	0.001	C	no qualifier
Chloride	3.54	3.52	0.57	0.20	D	no qualifier
Nitrate/Nitrite as N	1.52	1.53	0.66	0.050	D	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<0.002	105.3%	0.99%	96.51%	14.65%	0.002	0.002
Soluble reactive phosphorous	<0.001	100.0%	4.80%	102.16%	11.90%	0.001	0.001
Chloride	<0.20	101.0%	0.4%	98.10%		0.02	0.20
Nitrate/Nitrite as N	<0.050	99.6%	1.3%	102.00%		0.040	0.050

Acceptance Limits	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Bromide	<MRL	90% to 110%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic					
Bromide					
Cadmium					
Calcium					
Chloride	OK	OK	OK	OK	
Chromium					
Copper					
Flouride					
Lead					
Magnesium					
Manganese					
Mercury					
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium					
Sodium					
Zinc					

Sampling Round: 1/2023 Sample Date: 2/2/2023
Laboratory Work Order: 1737579 & X3B0051

FIELD DUPLICATE ASSESSMENT

5507A04	Sample Result	Field Duplicate Result	RPD	MRL	Case	Qualifier
Phosphorus	0.003	0.003	0.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.003	0.003	0.00	0.001	C	no qualifier
Arsenic			#DIV/0!	0.001	C	no qualifier
Bromide			#DIV/0!	0.1	C	no qualifier
Cadmium			0.00	0.0002	C	no qualifier
Calcium			#DIV/0!	0.1	C	no qualifier
Chloride	6.59	6.65	0.91	0.20	D	no qualifier
Chromium			0.00	0.0015	C	no qualifier
Copper			#DIV/0!	0.001	C	no qualifier
Fluoride			0.00	0.1	C	no qualifier
Lead			0.00	0.001	C	no qualifier
Magnesium			#DIV/0!	0.5	C	no qualifier
Manganese			0.00	0.001	C	no qualifier
Mercury			0.00	0.0002	C	no qualifier
Nitrate/Nitrite as N	0.741	0.745	0.54	0.050	D	no qualifier
Potassium			#DIV/0!	0.500	C	no qualifier
Sodium			#DIV/0!	0.5	C	no qualifier
Zinc			0.00	0.005	C	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	105.3%	0.86%	98.11%	13.66%	0.002	0.002
Soluble reactive phosphorous	<.001	102.6%	1.53%	104.73%	0.32%	0.001	0.001
Arsenic							0.001
Bromide							0.1
Cadmium							0.0002
Calcium							0.1
Chloride	<.20	102.0%	0.6%	102.00%		0.02	0.20
Chromium							0.0015
Copper							0.001
Flouride							0.1
Lead							0.001
Magnesium							0.5
Manganese							0.001
Mercury							0.0002
Nitrate/Nitrite as N	<.050	99.8%	0.4%	109.00%		0.040	0.050
Potassium							0.500
Sodium							0.5
Zinc							0.005

Acceptance Limits	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Bromide	<MRL	90% to 110%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic					
Bromide					
Cadmium					
Calcium					
Chloride	OK	OK	OK	OK	
Chromium					
Copper					
Flouride					
Lead					
Magnesium					
Manganese					
Mercury					
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium					
Sodium					
Zinc					

HOLDING TIME CHECK

Sampling Round (QTR/YR): 2/2023

			Sample Date	4/25/2023	Sample Date	5/2/2023	Sample Date	5/10/2023
Analyte	Holding Time	HT in days	Analysis Date	Within HT	Analysis Date	Within HT	Analysis Date	Within HT
Arsenic	6 months	180	5/8/2023	Yes	5/15/2023	Yes	5/24/2023	Yes
Cadmium	6 months	180	5/8/2023	Yes	5/15/2023	Yes	5/24/2023	Yes
Calcium	6 months	180						
Chloride	28 days	28	4/27/2023	Yes	5/4/2023	Yes	5/12/2023	Yes
Chromium	6 months	180						
Copper	6 months	180	5/8/2023	Yes	5/15/2023	Yes	5/24/2023	Yes
Flouride	28 days	28						
Lead	6 months	180	5/8/2023	Yes	5/15/2023	Yes	5/24/2023	Yes
Magnesium	6 months	180						
Manganese	6 months	180						
Mercury	28 days	28	5/8/2023	Yes	5/16/2023	Yes	5/16/2023	Yes
Nitrate/Nitrite as N	28 days	28	5/9/2023	Yes	5/17/2023	Yes	5/18/2023	Yes
Potassium	6 months	180						
Sodium	6 months	180						
Zinc	6 months	180	5/8/2023	Yes	5/15/2023	Yes	5/24/2023	Yes
Total Phosphorus	28 days	28	5/1/2023	Yes	5/8/2023	Yes	5/17/2023	Yes
SRP	48 hours	2	4/26/2023	Yes	5/3/2023	Yes	5/11/2023	Yes

Sampling Round: 2/2023 Sampling date: 4/25/2023
Laboratory Work Order: 1739640 & X3D0371

5427L01	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.009	0.006	40.00	0.002	C	qualifier
Soluble Reactive Phosphorus	0.006	0.006	0.00	0.001	D	no qualifier
Chloride	11.6	11.4	1.74	0.20	D	no qualifier
Nitrate/Nitrite as N	1.86	1.86	0.00	0.050	D	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	101.1%	2.45%	97.2%	11.2%	0.002	0.002
Soluble reactive phosphorous	<.001	102.6%	2.18%	97.3%	2.4%	0.001	0.001
Arsenic	<.001	93.3%	5.8%	92.2%			0.001
Cadmium	<.0002	97.7%	0.6%	96.6%			0.0002
Calcium							0.1
Chloride	<.2	101.0%	0.3%	90.3%		0.04	0.20
Chromium							0.0015
Copper	<.001	97.8%	6.7%	89.7%			0.001
Flouride							0.1
Lead	<.001	100.0%	1.5%	98.0%			0.001
Magnesium							0.5
Manganese							0.001
Mercury	<.0002	104.0%	7.5%	113.0%			0.0002
Nitrate/Nitrite as N	<.050	104.0%	2.8%	103.0%		0.030	0.050
Potassium							0.500
Sodium							0.5
Zinc	<0.005	96.5%	4.1%	97.3%			0.005

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic	OK	OK	OK	OK	
Cadmium	OK	OK	OK	OK	
Calcium					
Chloride	OK	OK	OK	OK	
Chromium					
Copper	OK	OK	OK	OK	
Flouride					
Lead	OK	OK	OK	OK	
Magnesium					
Manganese					
Mercury	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium					
Sodium					
Zinc	OK	OK	OK	OK	

Sampling Round: 2/2023 **Sampling date: 5/2/2023**
Laboratory Work Order: 1739807 & X3E0063

FIELD DUPLICATE ASSESSMENT

5310Q01	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.003	0.004	28.57	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.002	0.002	0.00	0.001	C	no qualifier
Arsenic			#DIV/0!	0.001	C	no qualifier
Cadmium			NA	0.0002	C	no qualifier
Calcium			#DIV/0!	0.1	C	no qualifier
Chloride	6.92	6.92	0.00	0.20	D	no qualifier
Chromium			NA	0.0015	C	no qualifier
Copper			NA	0.001	C	no qualifier
Fluoride			NA	0.1	C	no qualifier
Lead			NA	0.001	C	no qualifier
Magnesium			#DIV/0!	0.5	C	no qualifier
Manganese			NA	0.001	C	no qualifier
Mercury			NA	0.0002	C	no qualifier
Nitrate/Nitrite as N	0.767	0.778	1.42	0.050	D	no qualifier
Potassium			#DIV/0!	0.500	C	no qualifier
Sodium			#DIV/0!	0.5	C	no qualifier
Zinc			NA	0.005	C	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	98.9%	1.36%	100.4%	11.9%	0.002	0.002
Soluble reactive phosphorous	<.001	102.6%	3.98%	93.4%	4.9%	0.001	0.001
Arsenic	<.001	98.1%	1.6%	100.0%		0.00021	0.001
Cadmium	<.0002	99.5%	2.0%	96.0%		0.000063	0.0002
Calcium							0.1
Chloride	<.2	96.3%	0.0%	99.4%		0.2	0.02
Chromium							0.0015
Copper	<.001	98.3%	1.8%	97.7%		0.00036	0.001
Flouride							0.1
Lead	<.001	99.0%	2.5%	93.3%		0.00014	0.001
Magnesium							0.5
Manganese							0.001
Mercury	<.0002	108.0%	2.3%	106.0%		0.000093	0.0002
Nitrate/Nitrite as N	<.050	101.0%	1.8%	104.0%		0.080	0.100
Potassium							0.500
Sodium							0.5
Zinc	<.005	95.9%	2.3%	98.7%		0.002	0.005

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic	OK	OK	OK	OK	
Cadmium	OK	OK	OK	OK	
Calcium					
Chloride	OK	OK	OK	OK	
Chromium					
Copper	OK	OK	OK	OK	
Flouride					
Lead	OK	OK	OK	OK	
Magnesium					
Manganese					
Mercury	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium					
Sodium					
Zinc	OK	OK	OK	OK	

Sampling Round: 2/2023 **Sampling date: 5/10/2023**
Laboratory Work Order: 1739993 & X3E0222

FIELD DUPLICATE ASSESSMENT

5507A04	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.005	0.005	0.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.003	0.003	0.00	0.001	C	no qualifier
Arsenic	0.0019	0.00195	2.60	0.001	C	no qualifier
Cadmium	ND	ND	0.00	0.0002	A	no qualifier
Calcium				0.1	C	no qualifier
Chloride	4.04	4.04	0.00	0.20	D	no qualifier
Chromium				0.0015	C	no qualifier
Copper	0.00321	ND	104.99	0.001	B	qualifier
Fluoride				0.1	C	no qualifier
Lead	ND	ND	0.00	0.001	A	no qualifier
Magnesium				0.5	C	no qualifier
Manganese				0.001	C	no qualifier
Mercury	ND	ND	0.00	0.0002	A	no qualifier
Nitrate/Nitrite as N	1.58	1.59	0.63	0.050	D	no qualifier
Potassium				0.500	C	no qualifier
Sodium				0.5	C	no qualifier
Zinc	ND	ND	0.00	0.005	A	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	103.3%	2.27%	93.4%	12.9%	0.002	0.002
Soluble reactive phosphorous	<.001	105.1%	3.84%	103.1%	6.0%	0.001	0.001
Arsenic	<.00100	98.7%	3.2%	86.6%		0.00021	0.001
Cadmium	<.000200	99.0%	1.5%	86.2%		0.000063	0.0002
Calcium							0.1
Chloride	<.2	101.0%	0.5%	106.0%		0.02	0.20
Chromium							0.0015
Copper	<.00100	85.1%	8.4%	80.2%		0.00036	0.001
Flouride							0.1
Lead	<.00100	99.6%	2.9%	86.3%		0.00014	0.001
Magnesium							0.5
Manganese							0.001
Mercury	<.000200	108.0%	2.3%	106.0%		0.000093	0.0002
Nitrate/Nitrite as N	<.05	98.4%	0.1%	102.0%		0.040	0.050
Potassium							0.500
Sodium							0.5
Zinc	<.00500	96.1%	6.0%	84.0%		0.02	0.2

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic	OK	OK	OK	OK	
Cadmium	OK	OK	OK	OK	
Calcium					
Chloride	OK	OK	OK	OK	
Chromium					
Copper	OK	OK	OK	OK	
Flouride					
Lead	OK	OK	OK	OK	
Magnesium					
Manganese					
Mercury	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium					
Sodium					
Zinc	OK	OK	OK	OK	

HOLDING TIME CHECK

Sampling Round (QTR/YR): 3/2023

			Sample Date	7/25/2023	Sample Date	7/31/2023	Sample Date	8/1/2023	Sample Date	8/3/2023	Sample Date	8/4/2023
Analyte	Holding Time	HT in days	Analysis Date	Within HT	Analysis Date	Within HT	Analysis Date	Within HT	Analysis Date	Within HT	Analysis Date	Within HT
Arsenic	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/14/2023	Yes	8/16/2023	Yes	8/18/2023	Yes
Cadmium	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/14/2023	Yes	8/16/2023	Yes	8/18/2023	Yes
Calcium	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/10/2023	Yes	8/12/2023	Yes	8/12/2023	Yes
Chloride	28 days	28	7/27/2023	Yes	8/2/2023	Yes	8/3/2023	Yes	8/8/2023	Yes	8/8/2023	Yes
Chromium	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/14/2023	Yes	8/16/2023	Yes	8/18/2023	Yes
Copper	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/14/2023	Yes	8/16/2023	Yes	8/20/2023	Yes
Flouride	28 days	28	7/27/2023	Yes	8/2/2023	Yes	8/3/2023	Yes	8/8/2023	Yes	8/8/2023	Yes
Lead	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/14/2023	Yes	8/16/2023	Yes	8/18/2023	Yes
Magnesium	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/10/2023	Yes	8/12/2023	Yes	8/12/2023	Yes
Manganese	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/14/2023	Yes	8/16/2023	Yes	8/18/2023	Yes
Mercury	28 days	28	8/8/2023	Yes	8/8/2023	Yes	8/14/2023	Yes	8/18/2023	Yes	8/22/2023	Yes
Nitrate/Nitrite as N	28 days	28	7/28/2023	Yes	8/4/2023	Yes	8/4/2023	Yes	8/7/2023	Yes	8/9/2023	Yes
Potassium	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/10/2023	Yes	8/12/2023	Yes	8/12/2023	Yes
Sodium	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/10/2023	Yes	8/12/2023	Yes	8/12/2023	Yes
Zinc	6 months	180	8/9/2023	Yes	8/10/2023	Yes	8/14/2023	Yes	8/16/2023	Yes	8/18/2023	Yes
Total Phosphorus	28 days	28	7/31/2023	Yes	8/7/2023	Yes	8/7/2023	Yes	8/14/2023	Yes	8/14/2023	Yes
SRP	48 hours	2	7/27/2023	Yes	8/2/2023	Yes	8/3/2023	Yes	8/4/2023	Yes	8/7/2023	No

Sampling Round: 3/2023 **Sampling date: 7/25/2023**
Laboratory Work Order: 1741657 & X3G0424

FIELD DUPLICATE ASSESSMENT

5427L01	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.008	0.008	0.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.008	0.006	28.57	0.001	D	no qualifier
Arsenic	0.00458	0.00469	2.37	0.001	C	no qualifier
Cadmium	ND	ND	0.00	0.0002	A	no qualifier
Calcium	53.6	54.7	2.03	0.1	D	no qualifier
Chloride	12.8	12.4	3.17	0.20	D	no qualifier
Chromium	ND	ND	0.00	0.0015	A	no qualifier
Copper	0.00171	0.00168	1.77	0.001	C	no qualifier
Fluoride	ND	ND	0.00	0.1	A	no qualifier
Lead	ND	ND	0.00	0.001	A	no qualifier
Magnesium	19.5	19.7	1.02	0.5	D	no qualifier
Manganese	ND	ND	0.00	0.001	A	no qualifier
Mercury	ND	ND	0.00	0.0002	A	no qualifier
Nitrate/Nitrite as N	2.28	2.33	2.17	0.050	D	no qualifier
Potassium	2.75	2.83	2.87	0.500	D	no qualifier
Sodium	7.4	7.55	2.01	0.5	D	no qualifier
Zinc	ND	0.005	0.00	0.005	B	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<0.002	103.3%	1.98%	103.3%	3.1%	0.002	0.002
Soluble reactive phosphorous	<.001	100.0%	2.13%	98.2%	4.4%	0.001	0.001
Arsenic	<.001	102.0%	21.4%	129.0%			0.001
Cadmium	<0.002	103.0%	21.5%	121.0%			0.0002
Calcium	<0.1	101.0%	0.6%	100.0%			0.1
Chloride	<.2	98.4%	0.2%	95.7%		0.04	0.20
Chromium	<.00150	103.0%	22.5%	131.0%			0.0015
Copper	<.001	104.0%	21.8%	124.0%			0.001
Flouride	<.1	98.7%	1.5%	93.3%			0.1
Lead	<.001	105.0%	17.5%	125.0%			0.001
Magnesium	<.5	108.0%	0.8%	109.0%			0.5
Manganese	<.0004	103.0%	21.9%	127.0%			0.001
Mercury	<.0002	107.0%	4.8%	104.0%			0.0002
Nitrate/Nitrite as N	<.050	101.0%	0.1%	104.0%		0.030	0.050
Potassium	<.5	102.0%	0.2%	105.0%			0.500
Sodium	<.5	102.0%	0.1%	104.0%			0.5
Zinc	<.005	102.0%	20.0%	125.0%			0.005

ACCEPTANCE CRITERIA

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic	OK	OK	J	M	
Cadmium	OK	OK	J	OK	
Calcium	OK	OK	OK	OK	
Chloride	OK	OK	OK	OK	
Chromium	OK	OK	J	J+	
Copper	OK	OK	J	OK	
Flouride	OK	OK	OK	OK	
Lead	OK	OK	OK	OK	
Magnesium	OK	OK	OK	OK	
Manganese	OK	OK	J	J+	
Mercury	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium	OK	OK	OK	OK	
Sodium	OK	OK	OK	OK	
Zinc	OK	OK	OK	OK	

Sampling Round: 3/2023 **Sampling date: 7/31/2023**
Laboratory Work Order:1741787 & X3H0021

FIELD DUPLICATE ASSESSMENT

5310Q01	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.004	0.004	0.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.004	0.003	28.57	0.001	C	no qualifier
Arsenic	0.00311	0.00319	2.54	0.001	C	no qualifier
Cadmium	ND	ND	0.00	0.0002	A	no qualifier
Calcium	24	24.2	0.83	0.1	D	no qualifier
Chloride	6.65	6.65	0.00	0.20	D	no qualifier
Chromium	ND	ND	0.00	0.0015	A	no qualifier
Copper	ND	ND	0.00	0.001	A	no qualifier
Fluoride	ND	ND	0.00	0.1	A	no qualifier
Lead	ND	ND	0.00	0.001	A	no qualifier
Magnesium	8.0	8.08	1.00	0.5	D	no qualifier
Manganese	0.0146	0.0162	10.39	0.001	D	no qualifier
Mercury	ND	ND	0.00	0.0002	A	no qualifier
Nitrate/Nitrite as N	0.726	0.728	0.28	0.050	D	no qualifier
Potassium	1.39	1.41	1.43	0.500	C	no qualifier
Sodium	3.21	3.23	0.62	0.5	D	no qualifier
Zinc	ND	ND	0.00	0.005	A	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	99.8%	2.76%	101.01%	4.4%	0.002	0.002
Soluble reactive phosphorous	<.001	100.0%	0.43%	102.5%	11.3%	0.001	0.001
Arsenic	<.001	92.5%	0.2%	96.6%			0.001
Cadmium	<0.0001	91.9%	0.9%	95.9%			0.0002
Calcium	<.1	95.9%	0.5%	96.6%			0.1
Chloride	<.20	101.0%	0.7%	109.0%		0.04	0.20
Chromium	<.001	92.7%	0.9%	96.2%			0.0015
Copper	<.00040	93.9%	1.1%	96.2%			0.001
Flouride	<.1	104.0%	2.4%	104.0%			0.1
Lead	<.001	92.7%	1.3%	96.9%			0.001
Magnesium	<.500	97.8%	1.0%	100.0%			0.5
Manganese	<.00040	94.7%	3.5%	98.6%			0.001
Mercury	<.00205	103.0%	16.5%	98.9%			0.0002
Nitrate/Nitrite as N	<.050	105.0%	2.0%	106.0%		0.030	0.050
Potassium	<.5	99.7%	0.6%	101.0%			0.500
Sodium	<.50	97.3%	0.6%	97.7%			0.5
Zinc	<.00400	94.3%	0.5%	96.8%			0.005

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic	OK	OK	OK	OK	
Cadmium	OK	OK	OK	OK	
Calcium	OK	OK	OK	OK	
Chloride	OK	OK	OK	OK	
Chromium	OK	OK	OK	OK	
Copper	OK	OK	OK	OK	
Flouride	OK	OK	OK	OK	
Lead	OK	OK	OK	OK	
Magnesium	OK	OK	OK	OK	
Manganese	OK	OK	OK	OK	
Mercury	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium	OK	OK	OK	OK	
Sodium	OK	OK	OK	OK	
Zinc	OK	OK	OK	OK	

Sampling Round: 3/2023 **Sampling date: 8/1/2023**
Laboratory Work Order: 1741843 & X3H0041

FIELD DUPLICATE ASSESSMENT

6327N04	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.002	0.002	0.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.002	0.001	66.67	0.001	C	no qualifier
Arsenic	0.00159	0.00151	5.16	0.001	C	no qualifier
Cadmium	ND	ND	0.00	0.0002	A	no qualifier
Calcium	36.5	37.1	1.63	0.1	D	no qualifier
Chloride	12.6	11.1	12.66	0.20	D	no qualifier
Chromium	ND	ND	0.00	0.0015	A	no qualifier
Copper	ND	ND	0.00	0.001	A	no qualifier
Fluoride	ND	ND	0.00	0.1	A	no qualifier
Lead	ND	ND	0.00	0.001	A	no qualifier
Magnesium	21.0	21.6	2.82	0.5	D	no qualifier
Manganese	ND	ND	0.00	0.001	A	no qualifier
Mercury	ND	ND	0.00	0.0002	A	no qualifier
Nitrate/Nitrite as N	2.04	1.72	17.02	0.050	D	no qualifier
Potassium	3.27	3.34	2.12	0.500	D	no qualifier
Sodium	11	11.1	0.90	0.5	D	no qualifier
Zinc	ND	ND	0.00	0.005	A	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	100.0%	2.84%	98.8%	9.4%	0.002	0.002
Soluble reactive phosphorous	<.001	94.9%	4.08%	101.0%	0.0%	0.001	0.001
Arsenic	<.001	92.3%	3.4%	92.7%			0.001
Cadmium	<0.0001	93.8%	2.8%	92.4%			0.0002
Calcium	<.1	97.0%	0.6%	96.3%			0.1
Chloride	<.2	100.0%	0.7%	103.0%		0.04	0.20
Chromium	<.001	94.5%	6.1%	95.7%			0.0015
Copper	<.0004	95.9%	4.3%	93.3%			0.001
Flouride	<.1	102.0%	1.0%	99.1%			0.1
Lead	<.001	95.4%	0.2%	92.1%			0.001
Magnesium	<.5	98.4%	2.3%	101.0%			0.5
Manganese	<.0004	95.5%	7.0%	92.9%			0.001
Mercury	<.0002	108.0%	0.9%	106.0%			0.0002
Nitrate/Nitrite as N	<.050	105.0%	1.5%	106.0%		0.030	0.050
Potassium	<.5	101.0%	0.3%	103.0%			0.500
Sodium	<.5	98.4%	0.6%	98.5%			0.5
Zinc	<.004	93.6%	4.0%	92.7%			0.005

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic	OK	OK	OK	OK	
Cadmium	OK	OK	OK	OK	
Calcium	OK	OK	OK	OK	
Chloride	OK	OK	OK	OK	
Chromium	OK	OK	OK	OK	
Copper	OK	OK	OK	OK	
Flouride	OK	OK	OK	OK	
Lead	OK	OK	OK	OK	
Magnesium	OK	OK	OK	OK	
Manganese	OK	OK	OK	OK	
Mercury	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium	OK	OK	OK	OK	
Sodium	OK	OK	OK	OK	
Zinc	OK	OK	OK	OK	

Sampling Round: 3/2023 **Sampling date: 8/3/2023**
Laboratory Work Order: 1741892 & X3H0095

FIELD DUPLICATE ASSESSMENT

6524R01	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.003	0.004	28.57	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.003	0.003	0.00	0.001	C	no qualifier
Arsenic	0.00233	0.00227	2.61	0.001	C	no qualifier
Cadmium	ND	ND	0.00	0.0002	A	no qualifier
Calcium	37.9	39.2	3.37	0.1	D	no qualifier
Chloride	5.04	5.04	0.00	0.20	D	no qualifier
Chromium	ND	ND	0.00	0.0015	A	no qualifier
Copper	ND	ND	0.00	0.001	A	no qualifier
Fluoride	ND	ND	0.00	0.1	A	no qualifier
Lead	ND	ND	0.00	0.001	A	no qualifier
Magnesium	15.1	15.4	1.97	0.5	D	no qualifier
Manganese	ND	ND	0.00	0.001	A	no qualifier
Mercury	ND	ND	0.00	0.0002	A	no qualifier
Nitrate/Nitrite as N	2.02	2.07	2.44	0.050	D	no qualifier
Potassium	2.07	2.12	2.39	0.500	C	no qualifier
Sodium	3.4	3.53	3.75	0.5	D	no qualifier
Zinc	ND	ND	0.00	0.005	A	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<0.002	103.3%	1.35%	103.1%	9.5%	0.002	0.002
Soluble reactive phosphorous	<0.001	94.9%	3.97%	98.0%	3.9%	0.001	0.001
Arsenic	<0.001	99.3%	2.9%	76.4%			0.001
Cadmium	<.0001	97.2%	2.2%	73.1%			0.0002
Calcium	<0.1	94.3%	6.7%	104.0%			0.1
Chloride	<0.2	103.0%	0.1%	105.0%		0.04	0.20
Chromium	<0.001	99.7%	1.5%	77.8%			0.0015
Copper	<0.0004	100.0%	2.5%	74.1%			0.001
Flouride	<0.1	102.0%	0.2%	101.0%			0.1
Lead	<0.001	97.6%	3.6%	74.8%			0.001
Magnesium	<0.5	95.7%	4.7%	102.0%			0.5
Manganese	<0.0004	100.0%	2.7%	76.9%			0.001
Mercury	<0.0002	106.0%	9.7%	101.0%			0.0002
Nitrate/Nitrite as N	<0.050	107.0%	1.0%	108.0%		0.030	0.050
Potassium	<0.5	98.2%	6.3%	103.0%			0.500
Sodium	<0.5	96.3%	6.5%	101.0%			0.5
Zinc	<0.004	98.6%	1.9%	77.1%			0.005

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic	OK	OK	OK	OK	
Cadmium	OK	OK	OK	J-	
Calcium	OK	OK	OK	OK	
Chloride	OK	OK	OK	OK	
Chromium	OK	OK	OK	OK	
Copper	OK	OK	OK	J-	
Flouride	OK	OK	OK	OK	
Lead	OK	OK	OK	J-	
Magnesium	OK	OK	OK	OK	
Manganese	OK	OK	OK	OK	
Mercury	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium	OK	OK	OK	OK	
Sodium	OK	OK	OK	OK	
Zinc	OK	OK	OK	OK	

Sampling Round: 3/2023 **Sampling date: 8/4/2023**
Laboratory Work Order: 1741920 & X3H0121

FIELD DUPLICATE ASSESSMENT

5411R03	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.004	0.004	0.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.004	0.003	28.57	0.001	C	no qualifier
Arsenic	0.00256	0.00109	80.55	0.001	C	qualifier
Cadmium	ND	ND	0.00	0.0002	A	no qualifier
Calcium	27.1	27	0.37	0.1	D	no qualifier
Chloride	3.37	3.37	0.00	0.20	D	no qualifier
Chromium	ND	ND	0.00	0.0015	A	no qualifier
Copper	ND	ND	0.00	0.001	A	no qualifier
Fluoride	ND	ND	0.00	0.1	A	no qualifier
Lead	ND	ND	0.00	0.001	A	no qualifier
Magnesium	10.7	10.9	1.85	0.5	D	no qualifier
Manganese	ND	ND	0.00	0.001	A	no qualifier
Mercury	ND	ND	0.00	0.0002	A	no qualifier
Nitrate/Nitrite as N	0.947	2.16	78.08	0.050	D	qualifier
Potassium	1.8	1.78	1.12	0.500	C	no qualifier
Sodium	2.79	2.78	0.36	0.5	D	no qualifier
Zinc	ND	ND	0.00	0.005	A	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	102.9%	1.84%	100.3%	5.2%	0.002	0.002
Soluble reactive phosphorous	<.001	100.0%	0.56%	101.1%	3.9%	0.001	0.001
Arsenic	<.00100	92.0%	11.0%	90.4%			0.001
Cadmium	<0.000100	95.6%	6.3%	90.9%			0.0002
Calcium	<0.100	94.1%	0.8%	93.2%			0.1
Chloride	<0.20	102.0%	0.7%	106.0%		0.04	0.20
Chromium	<0.0010	96.1%	12.5%	88.3%			0.0015
Copper	<.00040	89.8%	12.2%	82.2%			0.001
Flouride	<0.100	102.0%	1.4%	102.0%			0.1
Lead	<0.00100	97.5%	5.6%	91.4%			0.001
Magnesium	<0.500	90.6%	1.2%	90.6%			0.5
Manganese	<0.00040	92.3%	14.3%	84.9%			0.001
Mercury	<0.000200	110.0%	4.6%	107.0%			0.0002
Nitrate/Nitrite as N	<0.050	109.0%	12.5%	102.0%		0.030	0.050
Potassium	<0.50	98.5%	0.8%	97.0%			0.500
Sodium	<0.50	97.0%	0.7%	95.6%			0.5
Zinc	<0.0040	94.7%	11.9%	85.7%			0.005

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Arsenic	OK	OK	OK	OK	
Cadmium	OK	OK	OK	OK	
Calcium	OK	OK	OK	OK	
Chloride	OK	OK	OK	OK	
Chromium	OK	OK	OK	OK	
Copper	OK	OK	OK	OK	
Flouride	OK	OK	OK	OK	
Lead	OK	OK	OK	OK	
Magnesium	OK	OK	OK	OK	
Manganese	OK	OK	OK	OK	
Mercury	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	
Potassium	OK	OK	OK	OK	
Sodium	OK	OK	OK	OK	
Zinc	OK	OK	OK	OK	

HOLDING TIME CHECK

Sampling Round (QTR/YR): 4/2023

			Sample Date	10/24/2023	Sample Date	11/8/2023	Sample Date	11/9/2023
Analyte	Holding Time	HT in days	Analysis Date	Within HT	Analysis Date	Within HT	Analysis Date	Within HT
Arsenic	6 months	180						
Cadmium	6 months	180						
Calcium	6 months	180						
Chloride	28 days	28	10/27/2023	Yes	11/10/2023	Yes	11/14/2023	Yes
Chromium	6 months	180						
Copper	6 months	180						
Flouride	28 days	28						
Lead	6 months	180						
Magnesium	6 months	180						
Manganese	6 months	180						
Mercury	28 days	28						
Nitrate/Nitrite as N	28 days	28	10/27/2023	Yes	11/15/2023	Yes	11/15/2023	Yes
Potassium	6 months	180						
Sodium	6 months	180						
Zinc	6 months	180						
Total Phosphorus	28 days	28	10/30/2023	Yes	11/13/2023	Yes	11/20/2023	Yes
SRP	48 hours	2	10/26/2023	Yes	11/9/2023	Yes	11/10/2023	Yes

Sampling Round: 4/2023 **Sampling date: 10/24/2023**
Laboratory Work Order: 1743649 & X3J0454

FIELD DUPLICATE ASSESSMENT

5427L01	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.005	0.004	22.22	0.002	C	no qualifier
Soluble Reactive Phosphorus	0.004	0.002	66.67	0.001	C	qualifier
Chloride	11.3	11.2	0.89	0.20	D	no qualifier
Nitrate/Nitrite as N	1.85	1.83	1.09	0.050	D	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	99.8%	1.52%	95.0%	8.0%	0.002	0.002
Soluble reactive phosphorous	<.001	102.6%	3.72%	110.2%	8.8%	0.001	0.001
Chloride	<.20	100.0%	0.4%	95.4%		0.22	0.20
Nitrate/Nitrite as N	<.050	98.1%	1.1%	96.6%		0.040	0.050

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Chloride	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	

Sampling Round: 4/2023 **Sampling date: 11/8/2023**
Laboratory Work Order: 1743963 & X3K0163

FIELD DUPLICATE ASSESSMENT

5310Q01	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	0.003	0.002	40.00	0.002	C	no qualifier
Soluble Reactive Phosphorus	ND	ND	0.00	0.001	A	no qualifier
Chloride	5.65	5.66	0.18	0.20	D	no qualifier
Nitrate/Nitrite as N	0.656	0.651	0.77	0.050	D	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	101.7%	2.18%	103.0%	8.1%	0.002	0.002
Soluble reactive phosphorous	<.001	102.6%	2.81%	93.3%	NC	0.001	0.001
Chloride	<.2	97.2%	2.1%	102.0%		0.02	0.20
Nitrate/Nitrite as N	<.050	97.4%	1.0%	107.0%		0.040	0.050

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Chloride	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	

Sampling Round: 4/2023 **Sampling date: 11/9/2023**

Laboratory Work Order: 1743986 & X3K0193

FIELD DUPLICATE ASSESSMENT

5507A04	Sample Result	Field Duplicate Result	RPD	MRL	Case	
Phosphorus	ND	ND	0.00	0.002	A	no qualifier
Soluble Reactive Phosphorus	ND	ND	0.00	0.001	A	no qualifier
Chloride	3.55	3.6	1.40	0.20	D	no qualifier
Nitrate/Nitrite as N	1.39	1.4	0.72	0.050	D	no qualifier

Note: If the sample result is ND and the duplicate has a result, use the MRL. If both sample and field duplicate is ND, relative % difference is 0.

	Acceptance Criteria	Qualifier
case A - both results are ND	no qualifier	
case B - one result is ND	absolute difference between result and MRL less than MRL	J
case C - results are less than 5x MRL	absolute difference of results less than MRL	J
case D - results are greater than or equal to 5x MRL	relative percent difference less than 30%	J
case E - one result is less than 5x MRL and one result is greater than or equal to 5x MRL	relative percent difference less than 30%	J

LABORATORY BLANK, LCS, and MS/MSD ASSESSMENT

Values	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD	Method Detection Limit	Method Reporting Limit
Phosphorus	<.002	103.2%	1.94%	102.2%	NC	0.002	0.002
Soluble reactive phosphorous	<.001	94.9%	2.36%	99.6%	NC	0.001	0.001
Chloride	<.20	100.0%	0.6%	105.0%		0.02	0.20
Nitrate/Nitrite as N	<.050	97.4%	1.0%	107.0%		0.040	0.050

<MRL	Blank	LCS % Recovery	MS/MSD RPD	MS/MSD % Recovery	Duplicates RPD
Phosphorus	<MRL	90% to 110%	<20%	80% to 117%	<22%
Soluble reactive phosphorous	<MRL	90% to 110%	<20%	80% to 117%	<17%
Arsenic	<MRL	85% to 115%	<20%	75% to 125%	
Cadmium	<MRL	85% to 115%	<20%	75% to 125%	
Calcium	<MRL	85% to 115%	<20%	75% to 125%	
Chloride	<MRL	90% to 110%	<20%	75% to 125%	
Chromium	<MRL	85% to 115%	<20%	75% to 125%	
Copper	<MRL	85% to 115%	<20%	75% to 125%	
Flouride	<MRL	90% to 110%	<20%	75% to 125%	
Lead	<MRL	85% to 115%	<20%	75% to 125%	
Magnesium	<MRL	85% to 115%	<20%	75% to 125%	
Manganese	<MRL	85% to 115%	<20%	75% to 125%	
Nitrate/Nitrite as N	<MRL	90% to 110%	<20%	90% to 110%	
Potassium	<MRL	85% to 115%	<20%	75% to 125%	
Zinc	<MRL	85% to 115%	<20%	75% to 125%	
Mercury	<MRL	85% to 115%	<20%	75% to 125%	
Sodium	<MRL	85% to 115%	<20%	75% to 125%	

Qualifiers	Blank	LCS	MS/MSD Duplicate	MS/MSD Recovery	Duplicates RPD
Phosphorus	OK	OK	OK	OK	OK
Soluble reactive phosphorous	OK	OK	OK	OK	OK
Chloride	OK	OK	OK	OK	
Nitrate/Nitrite as N	OK	OK	OK	OK	