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Source Water Protection Plan: Furry Creek Community Water System, Furry Creek, BC

Prepared for:

Fine Peace Furry Creek Development Ltd.
C/O CREUS Engineering Ltd.
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Vancouver, BC V64 2R1

SQUAMISH - LILLOOET REGIONAL DISTRICT

CREUS Engineering

January 16, 2023
Project: 22-107-01VC

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(EGBC Permit to Practice number 1001419)
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January 16, 2023

Fine Peace Furry Creek Development Ltd. C/O CREUS Engineering Ltd.
545-1199 West Pender Street
Vancouver, BC V6E 2R1
Attention: Kevin Healy, P.Eng.

Re: Source Water Protection Plan: Furry Creek Community Water System, Furry Creek, BC

Western Water Associates Ltd. is pleased to provide this report outlining a Source Water Protection Plan for the Squamish-Lillooet Regional District's (SLRD) Furry Creek Community Water System supply well P1, which is currently utilized as the drinking water supply for the Furry Creek Community, B.C., a potential new supply well (P5).

This report documents the assessment of the groundwater sources in the context of source water protection, and identifies framework and strategies for source water protection for the water system. This report has been updated based on discussion with Vancouver Coastal Health (VCH) and the SLRD. The framework and strategies identified in this report should be reviewed yearly and updated as needed.

We trust that the professional opinions and advice presented in this document are sufficient for your current requirements. Should you have any questions, or if we can be of further assistance in this matter, please contact the undersigned.

WESTERN WATER ASSOCIATES LTD.
(EBGC Permit to Practice 1001419)

Report by:

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1. INTRODUCTION

Western Water Associates Ltd. (WWAL) has developed a Source Water Protection Plan (SWPP) for the Furry Creek Community Water System (CWS) which is owned and operated by the Squamish-Lillooet Regional District (SLRD). Fine Peace Furry Creek Development Ltd. (Fine Peace) applied for rezoning and development of their lands at Furry Creek, BC and, as part of the approval process, Vancouver Coastal Health (VCH) and the SLRD requested a completed SWPP for the existing groundwater supply well and a new well being proposed to supply the development.

The purpose of this study is to complete an assessment of the current supply well and the potential new supply well, known as P1 and P5, respectively, and the source aquifer to: define the proposed groundwater protection areas, identify potential threats to the delivery of safe drinking water, and establish a framework and strategies for source water protection. The scope of work and methodology for this project are outlined below.

1.1 Assessment Structure and Guiding Documents

This SWPP incorporated the principles and procedures of several guidance documents, most notably the Comprehensive Drinking Water Source to Tap Assessment Guideline (S2TAG) as published by the BC Ministry of Healthy Living and Sport (British Columbia Ministry of Healthy Living and Sport, 2010).

The S2TAG provides a structured and consistent approach to evaluating risks to drinking water. It serves as a tool to develop a comprehensive understanding of the risks to drinking water safety and availability and provides a framework on how to operate effectively and produce the best possible water quality. The S2TAG consists of eight modules:

Module #1 - Delineate and characterize drinking water sources
Module #2 - Conduct contaminant source inventory
Module #3 - Assess water supply elements
Module #4 - Evaluate water system management, operation and maintenance practices
Module #5 - Audit water quality and availability
Module #6 - Review financial capacity and governance of water system
Module #7 - Characterize risks from source to tap
Module #8 - Recommend actions to improve drinking water protection

Modules #1 through #6 are hazard identification modules, and Modules #7 and #8 focus on risk characterization and risk management. Depending on the size and complexity of the water system, typically some or all of the modules are completed for a SWPP. This assessment focused on Modules #1, 2, 7 and 8 while aspects of the other modules were also discussed.

Components of another Provincial guidance document, the Well Protection Toolkit (British Columbia Ministry of Environment, 2006) were also used in this assessment. Methodologies for delineating well capture zones outlined in the Toolkit were used for this project, and tables outlining potential groundwater contaminants were reviewed.

1.2 SWPP Process

The general process for completing the SWPP was iterative and incorporated input and feedback from the Technical Advisory Committee (TAC) members listed below. The process included the following steps (step 6 to be completed after issuing this draft SWPP):

1. Reviewed existing background information on the wells and land use in the Furry Creek Area. Reviewed historical aerial photos, contaminated sites databases, and water quality data.
2. Established a TAC to guide the SWPP process.
3. Met with the TAC on September 7, 2022.
4. Completed a site reconnaissance of the area.
5. Provided a draft SWPP for the TAC's review.
6. Met with members of the TAC on November 25, 2022 and December 2, 2022.
7. Obtained and incorporated comments from the TAC into a final report.

The SWPP received input from the following individuals, as formal members of the TAC:

- Angela Belsham, Director of Environmental Services (SLRD);
- Clare Dewar, Senior Planner (SLRD);
- Dan Glover, Senior Environmental Health Officer (VCH);
- Kevin Healy, P.Eng., Principal (CREUS);
- Tim Sivak, P.Geo., Hydrogeologist (WWAL);
- Samuel Thompson, P.Eng., Environmental Services Project Manager (SLRD); and,
- Edward Witwicki, Senior Utilities Supervisor (SLRD).

2. SETTING

2.1 Physiography, Climate, and Surrounding Land Use

Figure 2.1 shows the location of Furry Creek and surrounding area. The Furry Creek community is located on Howe Sound, approximately 14 km south of Squamish and 30 km north of West Vancouver, BC. Situated along the Sea-to-Sky Highway (Highway 99), the area has a west facing aspect with moderate to steep slopes. Elevation across the site ranges from approximately 115 m above sea level (asl) near the eastern edge of the Furry Creek Golf Course, to sea level.

The project site extent is defined by the alluvial fan of Furry Creek. It is underlain by unconsolidated deposits containing gravel, sand, silt, clay and till-like soils. Glacial and recent alluvial processes likely deposited the soils at the site. Middle Creek and Furry Creek drain westward toward Howe Sound and there is an irrigation pond located approximately 200 m south of P5.

The current zoning in the project area consists of single family and duplex residential, marina residential, and commercial lands of the Furry Creek Golf Course. The proposed rezoning and development of Furry Creek by Fine Peace includes (but is not limited to) village commercial, community administration and

utility, park, open space, and low and midrise residential. The conceptual land use plan outlining the existing and proposed zoning areas, prepared by CREUS Engineering Ltd., is attached to this report for reference. As of 2020, the Furry Creek development included 4 duplex lots (1 duplex built), 56 townhouse units in Oliver's Landing Strata, a 743 m^2 (8,000 ft^2) community center building, 90 single family lots and the Furry Creek Golf Course (CREUS, 2021). A development agreement with the SLRD is in place, and Furry Creek has an approved Preliminary Layout Approval (PLA) with the Ministry of Transportation and Infrastructure from 1991. There are 920 total number of dwelling units in both the approved PLA from 1991 and the proposed rezoning from Fine Peace. To date, the golf course and club house have been completed, along with 56 condominium dwellings, 90 single-family and 4 duplexes (~15% of the total number of dwelling units) (Fine Peace, 2019). Rezoning is discussed further in Section 5.9.

Table 2.1 provides an overview of the climate normal data for Environment Canada's 'Squamish STP Central' Station (ID #1047671) located approximately 14 km north of the site in Squamish, BC. Based on Environment Canada Climate Normals (1981 – 2010) for the station, the average annual temperature and precipitation for the area are 10.1°C and 2230 mm, respectively. The majority of the annual precipitation falls as rain (96%) between the months of October and April in a typical year (Environment Canada, 2022).

Past climate trends are not necessarily indicative of future climate. Climate change is an ongoing process, and among the forecasted outcomes for the region is warming temperatures across seasons in addition to longer, drier summers and wetter winters with more precipitation falling as rain at lower elevations. There is also a predicted overall hydrologic transition from snowmelt-dominant watersheds to rainfall-dominant, increasing the need for water conservation and storage (PCIC, 2022).

Table 2.1. 1981-2010 Climate Normal Data for Squamish STP Central Station (ID #1047671)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall (mm)	300.2	179.7	198.4	152.5	115.7	82.6	59.3	66.2	82.6	255.5	382.2	268.4	2143.3
Snowfall (cm)	25.9	13.1	8.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	9.2	30.6	87.0
Precipitation (mm)	326.1	192.8	206.5	152.6	115.7	82.6	59.3	66.2	82.6	255.5	391.3	299.0	2230.2
Daily Average (°C)	2.7	4.6	6.7	9.9	12.9	15.5	17.8	17.8	15.0	10.3	5.5	2.5	10.1

Data Source: Environment Canada (http://climate.weather.gc.ca/climate_normals/station_select_1981_2010_e.html?searchType=stnProv&lstProvince=BC)

2.2 Geological Setting

The surficial geology of the area is mapped as recent alluvial fan deposits which transition to glaciomarine terrace sediments and ice contact deposits (Blaise-Stevens, 2008). Upland regions consist of exposed bedrock with thin veneers of possible colluvium and/or till. Drilling information indicated the presence of interbedded glacial outwash and till at depth in the overburden. The bedrock beneath the site is mapped as quartz dioritic intrusive rocks described as variably foliated quartz diorite and lesser granodiorite (Cui et al., 2017).

2.3 Hydrogeological Setting

According to the Ministry of Environment and Climate Change Strategy (ENV) Water Resources Atlas (WRA) (ENV, 2022a), provincially mapped Aquifer 404 underlies the project site. Aquifer 404 is a sand and gravel aquifer, comprised of alluvial fan deposits and glaciomarine terraced and ice-contact deposits. The province has characterized Aquifer 404 as having a high productivity and moderate demand and vulnerability (ENV, 2020a). Aquifer 404 is 0.8 km^2 in aerial extent and is bounded to the west by Howe Sound, and to the east by steeply rising granitic bedrock (ENV, 2020b). Most of Aquifer 404 is confined by clay and till deposits, although in some areas a confining layer may be absent (ENV, 2020a). The horizontal groundwater flow direction in the aquifer is inferred to be toward the west (Howe Sound).

Piteau Associates Ltd. (Piteau) and Thurber Engineering Ltd. (Thurber) inferred that the primary source of recharge to the aquifer is from shallow groundwater flow and runoff near bedrock/overburden contacts. Furry Creek was found to be generally perched above the groundwater table and is therefore expected to provide only limited recharge to the aquifer (Piteau and Thurber, 2007).

As the project site is adjacent to the ocean, saline water from Howe Sound is known to underlie freshwater within the overburden deposits of the aquifer at depth. The location of the interface between saline and freshwater changes seasonally and with the water balance of the aquifer. As such, the groundwater supply potentially at the site is connected to existing water use. Piteau and Thurber (2007) noted that long-term yields of existing wells would ultimately depend on the results of ongoing water level and salinity monitoring in the aquifer.

3. FURRY CREEK COMMUNITY WATER SYSTEM

The Furry Creek CWS provides potable water to 254 residents located within the community (Statistics Canada, 2016). In addition to serving the residents of Furry Creek, water is provided to some commercial developments including the Furry Creek Golf Course, however, irrigation water for the golf course comes from surface water as described below.

The water system currently sources groundwater from the upper portion of the alluvial fan. There are four existing groundwater extraction wells located in the aquifer: P1, P2, P5 and I1, however well P1 is operated by the SLRD as the only current supply. Water supply to the CWS may be augmented in the future using the existing surface water license for Furry Creek, or by constructing additional supply wells.

Wells P1 and I1 were originally drilled and assessed by Brown Erdman & Associates (Brown) (1992). P2 was constructed and tested under the direction of H. Reed Consulting Ltd. (Piteau and Thurber, 2007). Wells P2 and I1, originally constructed to supply the community with potable supply and the nearby golf course for irrigation, respectively, are not in use due to concerns regarding well interference between both wells, and the indication of sea water intrusion during test pumping at P2 (Piteau and Thurber, 2007). The golf course has used Furry Creek as its sole irrigation source since 2008. A new supply well with plate identification number (WPID) 51052, referred to as P5, was constructed and tested in 2019 under supervision of WWAL (WWAL 2019b; 2021b). P5 is located approximately 100 m north of Furry Creek,

and 170 m northeast of P1. It is anticipated that the SLRD will operate P5 to augment their current groundwater supply in support of the development proposed by Fine Peace.

Water from P1 is treated with chlorine at the water treatment plant and then pumped to a reservoir located to the north on Sea View Drive, where it is then distributed to the community. We understand that the water system was previously operated by Corix Utilities Ltd. on behalf of the SLRD since at least 2007. SLRD transferred the contract for operation of the system to Keats Island Construction & Services Ltd. in early 2021. Based on discussion with SLRD, P1 has recently been integrated into a SCADA system for monitoring water use volumes. Currently the SCADA system does not monitor water levels or electrical conductivity.

The locations of the reservoir and water treatment plant are shown on Figure 2.1. Figure 3.1 shows the location of the production and monitoring wells, a summary of the wells is provided in Table 3.1, and well logs are provided in Appendix A. There are seven existing groundwater observation wells completed in, and around, the Furry Creek Aquifer. These are: M1-S, M1-D, M2-S, M2-D, M4, TW06-03, TW06-04. Prior to WWAL, monitoring of the aquifer was conducted by Thurber Engineering Ltd. (Thurber) on behalf of the developer from 2007 to 2011 (Thurber, 2012; 2011; 2010) and for the SLRD by Thurber (2011-2015) (Thurber, 2015).

Table 3.1. Summary of Existing Wells At Furry Creek Site

Well ID	Ground Elevation		Depth to Top of Screen		Depth to Bottom of Screen		Well use
	(m)	(feet)	(m)	(feet)	(m)	(feet)	
M1-S	5.4	17.7	7.9	26	9.4	31	Shallow monitoring well
M1-D	5.4	17.7	82.6	271	88.7	291	Deep monitoring well
M2-S	3.6	11.8	7.6	25	8.8	29	Shallow monitoring well
M2-D	4.0	13.1	70.1	230	76.2	250	Deep monitoring well
P1	13.0	42.7	24.8	81.5	28	92	Existing supply well
P2	17.4	57.1	49.2	161.4	53.9	176.7	Former supply well now used as monitoring well
P5	16.6	54.5	26.1	85.6	29.3	96.1	Proposed future supply well
I1	12.0	39.4	45.1	148	49.8	163.5	Former irrigation well, discontinued since 2008. Not in use for irrigation or monitoring.
M4	17.9	58.7	46.3	152	52.4	172	Monitoring well
TW06-03	11.7	38.4	22.5	73.8	24.1	79.1	Test well completed in separate aquifer, now used as a monitoring well
TW06-04	13.4	44.0	31.3	102.7	32.9	107.9	Test well with low yield due to P1 interference and SW intrusion risk, now used as a monitoring well.

The Province issued a groundwater licence to the SLRD for the Furry Creek groundwater supply well P1 on October 11, 2017. The license authorizes a maximum diversion quantity of 220,900 m^3/year with a maximum diversion rate of 7 L/s from P1. As a condition of the groundwater licence for P1, the Province requested an aquifer monitoring plan (AMP) be submitted to the Water Manager for approval as follows:

A monitoring plan related to seawater intrusion, designed by a Qualified Professional (P.Geo. or P.Eng. with competencies in hydrogeology), outlining the monitoring that will be undertaken (e.g. electrical conductivity monitoring, metering of well extraction, water level monitoring, and/or water quality testing). This monitoring plan should include an early detection system (e.g. monitoring well(s) between the pumping wells and Howe Sound) as well as ongoing monitoring in the pumping wells. The submission of monitoring data – possibly in the format of an annual monitoring report - will be an ongoing condition of any license that is issued.

WWAL completed an AMP, dated May 11, 2017 (WWAL, 2017), in consultation with Ministry of Forests Lands and Natural Resources (now the Ministry of Forests) and the SLRD. The purpose of the annual monitoring program is to detect, assess, and report any hydrogeological impacts that may arise due to groundwater extraction. Following the methodology outlined in the AMP, annual groundwater monitoring reports were completed summarizing the data collected from July 2018 to August 2019 (WWAL, 2019a), August 2019 to February 2021 (WWAL, 2021a), and February 2021 to April 2022 (WWAL, 2022a).

As of September 2022, datalogging transducers (dataloggers) capable of measuring level, temperature and electrical conductivity (LTC) are currently installed in the following wells: P1, P2, M1-S, M1-D, TW06-03 and TW06-04. Although not required by the AMP, dataloggers are also present in I1 and P5.

3.1 Production Well Construction and Operating Details

As previously noted, the primary well used by the Furry Creek CWS is P1, and the anticipated new supply well is P5. Further information on these wells is provided in the following sections. Construction details for the wells is summarized in Table 3.2.

3.1.1 P1 (Current Supply Well)

The primary production well P1, with provincial Well Tag Number (WTN) 80583, was originally drilled and assessed by Brown (1991). The well was drilled by cable tool to a finished well depth of 29.9 m (98’), with 3.0 m (10’) of 400 mm (16’) diameter surface casing installed near the surface, followed by 300 mm (12’) diameter casing to depth. The screen assembly of P1 is comprised of a 3.2 m (10.5’) long, 200 mm (8”) diameter telescopic screen with 5 mm (0.2”) slot openings, and 0.9 m (3’) of 180 mm (7”) diameter riser. Following well construction, a pumping test program was completed, consisting of a 68.3-hour long constant rate test at 30.0 L/s (475 USgpm). Brown (1991) initially rated P1 at 40.0 L/s (629 USgpm), but recommended the rate not exceed 18.9 L/s (300 USgpm) until the aquifer was monitored against the risk of seawater intrusion. A Provincial assessment of P1 was later completed, which estimated its individual operational capacity to be on the order of 30.0 L/s (475 USgpm) (ENV, 1992). From the well log for P1, there is no evidence that it was completed with a surface seal.

In 2007, Piteau and Thurber completed a groundwater supply assessment for the Furry Creek CWS, which included pumping tests of the production and test wells, a water balance of the Furry Creek aquifer and a monitoring program. The report explained that withdrawal rates should remain significantly below the rate of recharge, to allow for sufficient flushing of the aquifer to mitigate against seawater intrusion. Piteau and Thurber (2007) calculated the sustainable yield of P1 using the average available drawdown above sea level and determined an average annual production rate and 60-day dry summer threshold of 7 L/s and 12.8 L/s for P1, respectively. Ultimately, the potential for seawater intrusion to occur was considered low provided pumping does not exceed the sustainable yield of Aquifer 404, estimated to be 10 L/s (Piteau and Thurber, 2007).

3.1.2 P5 (Potential Supply Well)

In 2019, WWAL provided hydrogeological services including design, drilling, test pumping, management and evaluation of groundwater quality and yield for well P5. Field Drilling Ltd. (Field), based out of Langley BC, constructed P5 between April 22 and 24, 2019 using a dual rotary rig. The potentially new production well for the Furry Creek CWS has total and finished well depths of 34.1 m (112') and 29.3 m, (96 ft), respectively, and is completed with two 200 mm (8") diameter, 1.5 m (5') long telescoping screen sections with 0.030" openings (30 slot) and 0.035" openings (35 slot), k-packer and 0.6 m long riser to a depth of 29.3 m (WWAL, 2019b; 2021b). The well was completed with 0.6 m (2') of casing stick-up above ground surface, and the static water level in the well was measured by Field to be 15.2 m (50') below the top of the casing upon completion of drilling. P5 is completed with a surface seal and meets the requirements of the Groundwater Protection Regulation (GWPR) (Province of British Columbia, 2016) for well construction.

Precision Service and Pumps Inc. (Precision), of Abbotsford, BC, conducted the test pumping program of well P5 between September 17 and 23, 2019 under the supervision of WWAL. The testing began with a 5-hour step test to assess the well performance, followed by a 48-hour long constant rate test to determine the long-term yield. Precision subsequently completed a 72-hour long constant rate test with simultaneous pumping of P5 and P1 to assess the impact of interference on well capacity and the potential for seawater intrusion. Based on the specific capacity of the well from the 72-hour drawdown test, the annual groundwater levels of the aquifer, and the available drawdown above sea level, the long-term yield of P5 was estimated to be 3.7 L/s (60 USgpm) (WWAL, 2021b). P5 is expected to support the new development in the area, and act as a backup well to P1 for added redundancy in the water system.

The construction details and assessed yields for P1 and P5 are summarized in Table 3.2.

Table 3.2. Furry Creek Production Well Construction Details

Well ID	P1	P5
Date Drilled	January 1991	April 2019
Driller	Unknown	Field Drilling Contractors Ltd.
Drilling Method	Cable tool	Dual Rotary
Nominal Diameter	300 mm (12')	200 mm (8")
Total Depth (bgs)	29.9 m (98')	29.3 m (96')

Well ID	P1	P5
Screen Details	200 slot screen, from 24.8 m to 28.0 m (81.5 to 92.0')	30 and 35 slot screen, from 26.1 m to 29.3 m (85.5 to 96')
Driller Estimated Yield	40.0 L/s (629 USgpm)[1]	7.6 L/s (120 USgpm)[2]
Assessed Yield	30.0 L/s (475 USgpm)[3]	3.7 L/s (60 USgpm)[4]
Static Water Level (btoc)	11.6 m (38')	15.2 m (50')
Lat. Decimal Degrees N	49.581328	49.58258
Lat. Decimal Degrees W	-123.221311	-123.21983
PID and/or Civic Address	405 Furry Creek Drive, Furry Creek PID 018-613-217	150 Country Club Road, Furry Creek PID 018-613-217

Note: bgs = below ground surface, btoc = below top of casing

[1] Estimated well yield reported by Brown Erdman & Associates (1991).

[2] Estimate well yield reported on well driller's log for WTN 80583, accessed from the BC Ministry of Environment GWELLS database (ENV, 2022c).

[3] Estimated well yield from ENV (1992).

[4] Estimated well yield from WWAL (2021a) to mitigate against the potential for seawater intrusion.

3.2 Water System Monitoring

The VCH Permit to Operate to the SLRD for the water system became effective on April 1, 1999 and was revised on April 29, 2015. We understand that the operating requirements based on this permit include the following:

- A Well Protection Plan for each well source;
- Review and update the Emergency Response Plan annually;
- Minimum bacteriological sampling frequency of 8/month; and,
- Maintaining a minimum chlorine residual of 0.20 ppm in the distribution system.

In addition to the bacteriological sampling requirements in the Permit to Operate, the SLRD operator also collects one groundwater sample per year from P1 for analysis of physical attributes (i.e., turbidity, conductivity, pH), bacteria, total metals, and volatile organic compounds). The sampling results are publicly available in the Furry Creek Water System reports on the SLRDs website (SLRD, 2022).

The SLRD is authorized to divert groundwater from P1 provided that the conditions of the groundwater license for P1 are met. As noted in Section 3, a condition of the P1 groundwater license is the development and implementation of an AMP related to seawater intrusion. WWAL established an AMP in 2017, requiring ongoing monitoring and sampling to mitigate the risk of seawater intrusion in the aquifer. WWAL has been completing the annual aquifer monitoring program based on the AMP since its inception (2017) to present.

Seawater intrusion increases the total dissolved solids (TDS) content of an aquifer. A general indication of the TDS content of water can be obtained by measuring its electrical conductivity (EC). Measurement of EC on a continual basis throughout the year, particularly in production wells, enables detection of any potential trends of escalating TDS and encroaching seawater.

Dataloggers are used to monitor EC, water levels and temperature in P1 and the monitoring wells on an hourly basis as outlined in the AMP. The dataloggers are currently downloaded tri-annually, during which time manual measurements of EC, temperature and water level are also collected.

3.3 Additional Sampling

At the request of CREUS, WWAL conducted additional water quality sampling at Furry Creek in April 2022 to address the potential risks to source water. As identified in previous studies, the highest potential risk sources of contamination to the aquifer are considered to be: seawater intrusion, chemicals and fertilizers from the nearby golf course, metal contaminations from surface water associated with legacy mining impacts, and leaking sanitary lines (WWAL, 2021b). The additional sampling was completed as follow-up to previous work completed by others in the early 1990s and 2000s (Thurber, 1994; Erdman, 2004; Thurber and Piteau, 2007) to address the potential risks of fertilizers and pesticides, and legacy mining at Britannia Creek mine to surface water and the aquifer in the Furry Creek watershed. Water samples collected from P1, select monitoring wells, and Furry Creek were analyzed for the following parameters to address the risk sources:

- Routine potability chemistry package;
- Pesticide/fungicide scan; and,
- Total metals.

For the April 2022 sampling event, CREUS provided a list of fertilizer products used on the Furry Creek Golf Course, which included fungicides, herbicides, plant growth regulators, and glycols (see Appendix B). WWAL reviewed the list of products and identified the active ingredients within each of them. The analysis package available from the laboratory could detect roughly a quarter of the active ingredients in the list. This percentage was considered suitable for screening whether or not the chemicals were present.

3.4 Water Usage

P1 is continuously operated to meet water system demands which vary through the seasons. Monthly groundwater extraction totals are collected by the SLRD's utility operator for the Furry Creek CWS. Extraction totals for P1 are summarized in Table 3.4 and displayed in Figure 3.2.

Table 3.3. Annual Groundwater Extraction Totals for the Furry Creek CWS (P1) Since 2009

Year[1]	Annual Extraction Total (m^3)	Average Extraction Rate (L/s)	60-day Summer Extraction Rate (July – Aug) (L/s)
2021[1]	117,014[4]	3.71	4.7
2020[1]	114,368	3.62	4.2
2019[1]	80,802	2.56	3.2
2018	29,091[6]	-	-
2014[2]	62,241	2.0	3.9

Year[1]	Annual Extraction Total (m^3)	Average Extraction Rate (L/s)	60-day Summer Extraction Rate (July – Aug) (L/s)
2013[2]	47,548	1.5	3.2
2012[2]	52,735	1.6	3.2
2011[3]	59,264[5]	1.9	1.5
2010[3]	96,102	3.0	5.5
2009[3]	81,252	2.5	4.1

[1] Total extraction volumes reported in WWAL's Aquifer Monitoring Reports (WWAL 2019b; 2021b; 2022).

[2] Total extraction volumes reported in Thurber's Furry Creek Aquifer 2015 Data Summary Report (Thurber 2015).

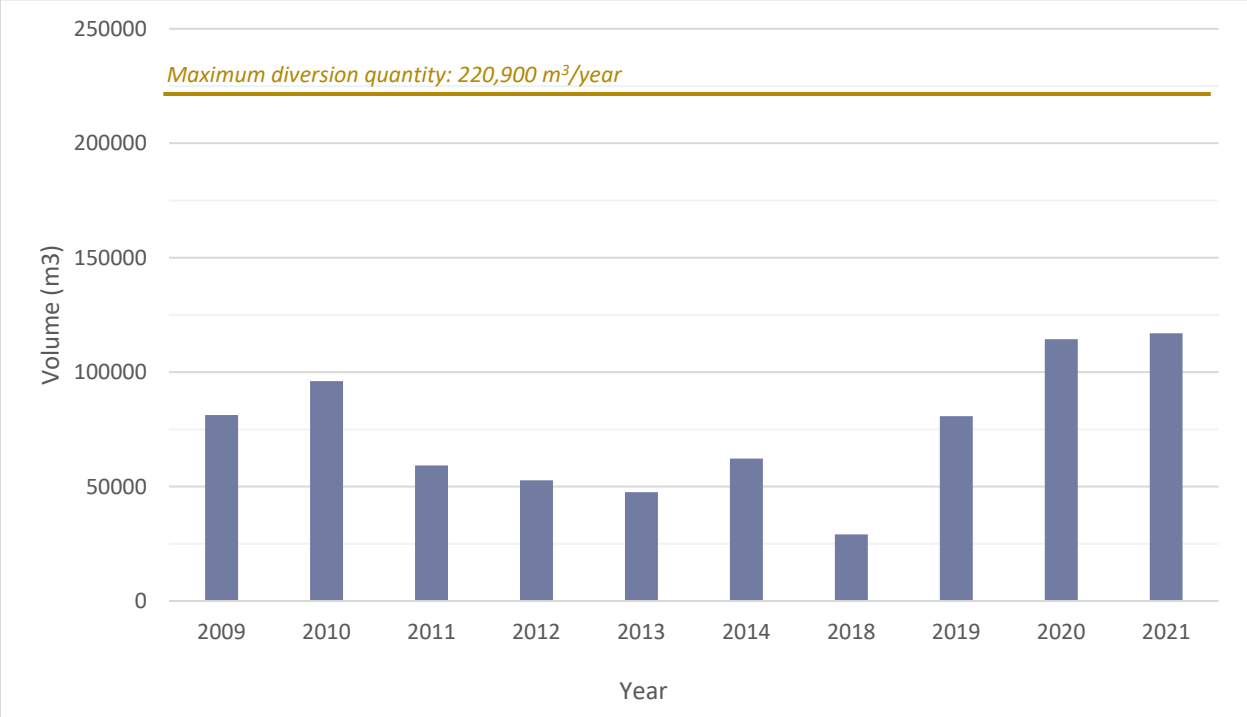
[3] Total extraction volumes reported in Thurber's Furry Creek Aquifer Data Summary Reports (Thurber 2012; 2011; 2010).

[4] January 2021 extraction data unavailable, annual extraction volume assumed to be on the order of 7,500 m^3.

[5] Significantly low extract rate recorded in July 2011, Corix attributed the anomalous value with mechanical/electrical issues. Actual July volume is likely similar to that of June and August 2011.

[6] Annual 2018 extraction data unavailable, value reported represents total extraction volume based on four months of data (from September to December 2018).

Figure 3.2. Annual Groundwater Extraction Totals for the Furry Creek CWS (P1) Since 2009



Notes:

Total extraction volumes reported in WWAL's Aquifer Monitor Reports for the SLRD (WWAL 2019b; 2021b; 2022), Thurber's Furry Creek Aquifer Data Summary Report for the SLRD (Thurber 2015), and Thurber's Furry Creek Aquifer Data Summary Reports for the developer (Thurber 2012; 2011; 2010). Annual groundwater extraction total for 2018 shown reflects only a partial year of data (September to December)

Table 3.4 and Figure 3.2 show that the average annual extraction rates are all well below the maximum diversion rate and quantity of 7 L/s and 220,900 m^3/year, respectively, and the 60-day summer threshold (12.8 L/s) as authorized by the groundwater licence granted for P1.

Based on Table 3.4 and Figure 3.2, the annual extraction totals have increased over the past 3 years. According to the operator, leaks in the water infrastructure were discovered in January and March, 2021 (WWAL, 2022) and repairs are in progress. The apparent increase in extraction totals over the most recent years may be related to both increased demand and leaking pipes.

4. MODULE #1: GROUNDWATER SOURCE DELINEATION AND CHARACTERIZATION

Module #1 from the S2TAG provides the framework for the source protection assessment by delineating well capture zones and source protection areas on which the subsequent steps in the process are focused. The following sections outline our delineation of the source protection areas, review well construction related hazards and describe the raw groundwater quality.

Capture zones are defined as the land area around a well that contributes water to (or recharges) the well. A variety of methods are available to delineate capture zones which vary in terms of their complexity and information requirements. Information typically incorporated into the calculation of capture zones includes well construction information, aquifer thickness and properties, well pumping rates, travel times, and direction and gradient of groundwater flow. In cases where little information is available or when small water systems are being assessed, simple capture zone delineation methods are employed such as arbitrary or calculated fixed radii around a well. In cases where more data exist, more complicated delineation methods such as analytical equations or hydrogeologic modelling may be employed.

In reality, due to the simplifying assumptions, there is always uncertainty associated with calculated capture zones. To address this and to provide a measure of conservatism, larger source protection areas are often defined based on the capture zones, which become the focus for subsequent hazard identification, risk assessment and risk management efforts.

4.1 Well Capture Zone Delineation

Guidance on selecting the methodology for capture zone delineation is provided in the S2TAG and is based on the number of connections in the water system and the information available. For the Furry Creek CWS wells, the Analytical Equations methodology was used to delineate the capture zones along with the following parameters: hydraulic conductivity (K), hydraulic gradient (i), transmissivity (T), porosity (n), and pumping rate (Q). The rationale for the values used for these parameters is as follows:

- **Hydraulic Conductivity (K):** Hydraulic conductivity values were used from previous hydrogeological studies for P1 (Piteau and Thurber, 2007) and P5 (WWAL, 2021b).
- **Hydraulic Gradient (i):** The horizontal groundwater flow gradient was determined from static water levels measured by WWAL on July 7, 2020.

- **Transmissivity (T):** Aquifer transmissivity values were used from previous hydrogeological studies for P1 and P5, respectfully (Piteau and Thurber, 2007; WWAL, 2021b).

- **Aquifer Porosity (n)**: The aquifer porosity used was based on work by Piteau and Thurber (2007).

- **Pumping Rates (Q)**: As noted in Section 3.1.1, pumping rates were recommended not to exceed the sustainable yield of the aquifer, which was estimated to be 10 L/s (Piteau and Thurber 2007). Furthermore, to allow for proper flushing of the aquifer, P1's average annual production rate was determined by Piteau and Thurber (2007) to be on the order of 7 L/s. With the overarching sustainable yield of the aquifer being 10 L/s, and P1's average annual production rate on the order of 7 L/s, P5 is expected to be operated at no more than 3 L/s (below its assessed rate) to mitigate for seawater intrusion (WWAL, 2021b).

- **Saturated Thickness (b):** For P1 the saturated thickness of the aquifer is based on the depth of the confining layer present at P1, and the well depth of P2 (located adjacent to P1). The confining layer depth at P1 was used to calculate the saturated thickness because the static water level is located above the confining layer. For P5, the saturated thickness is the height of the static water column above bedrock using the average water levels between June 25, 2021 and April 27, 2022.

The values used in defining the analytical capture zones are summarized in Table 4.1 and Appendix C provides the calculations for determining the capture zone areas.

Table 4.1. Capture Zone Parameters

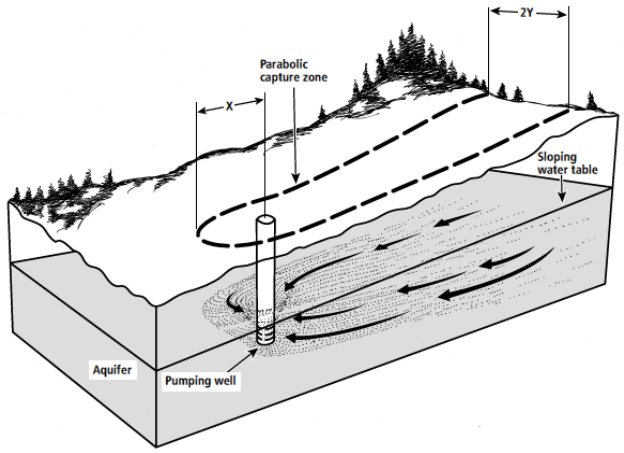
Parameter	Value	
	P1	P5
Hydraulic Conductivity (K)	6.1 x 10^{-4} m/s	7.6 x 10^{-5} m/s
Hydraulic Gradient (i)	0.01	0.01
Transmissivity (T)	855 m^2/day	130 m^2/day
Porosity (n)	0.2	0.2
Pumping Rates (Q)	7.0 L/s	3.0 L/s
Saturated Thickness (b)	29 m	20 m

Table 4.2 below presents the results of the Analytical Equation capture zone delineation, Figure 4.1 illustrates what the various parameters represent, and Figure 4.2 illustrates the capture zone areas that were determined for wells P1 and P5. The capture zones are truncated along the approximate extent of the alluvial fan and aquifer boundary, as the primary source of recharge to the aquifer is not expected to transpire outside of the fan. As shown in Figure 4.2, the 1-year capture zone for P1 extends outside the alluvial fan and the 1-year capture zone for P5 extends east to the clubhouse. The 5-year and 10-year capture zones for both wells extend outside the alluvial fan.

Table 4.2. Analytical Equation Capture Zone Summary

Parameter	P1	P5
Y (m)	35	100
2Y (m)	71	200
X (m)	11	32
1-year capture zone (m)	538	120
5-year capture zone (m)	2690	600
10-year capture zone (m)	5381	1,201

Figure 4.1 Depiction of Capture Zone from Analytical Equation Method



4.2 Development of Source Protection Area

The proposed well source protection areas for the Furry Creek CWS are shown in Figure 4.2. The primary source protection area was defined to be the combined analytical capture zones for the wells. A secondary well protection is defined to be the estimated extent of the alluvial fan deposits in the area (80 hectares in size), which includes a significant area west of the wells. Figure D1 showing the primary and secondary source protection areas is also included in Appendix D, provided to support the SLRD's Electoral Area D Official Community Plan (OCP).

The Furry Creek Watershed is also shown in Figure 4.2. As previously noted, Furry Creek was found to be generally perched above the groundwater table and is therefore not expected to be the main source of recharge to the aquifer. Primary aquifer recharge is inferred to be from shallow groundwater flow and runoff near bedrock/overburden contacts closer to the apex of the fan. Although it is not practical to apply well protection measures throughout the entire watershed, historical activities and future developments (rezoning) and land use planning within the upstream portions of the watershed should consider potential impacts to this water supply.

4.3 Existing Groundwater Quality

The most recent available water quality data for the Furry Creek CWS supply well (P1), the proposed supply well (P5), select monitoring wells (TW06-03, TW06-04, M1-S), and Furry Creek are summarized in Table 4.3. This sampling was carried out by WWAL (2022b) for the water quality assessment discussed in Section 3.3. We also obtained water quality results for P1 from the SLRD's publicly available water system reports (SLRD, 2022). The most recent sample from P1 was collected by the operator on April 20, 2022 and submitted to ALS Environmental Ltd. for analytical testing. The detailed laboratory reports for these sampling events are included in Appendix E.

Analytical results from the sampling were compared to Guidelines for Canadian Drinking Water Quality (GCDWQ) (Health Canada, 2022). All analyzed parameters in the water samples were below the maximum acceptable concentrations (MAC) of the GCDWQ at the time sampled and tested. The Aesthetic Objectives (AO) of the GCDWQ for total iron (0.3 mg/L) were exceeded at all wells except for P1 on the April 20, 2022 sampling date and M1-S. The AO for manganese (0.02 mg/L) was exceeded at TW06-03 and P5. The turbidity values for groundwater samples collected from P1 (April 27, 2022 sample), TW06-03, TW06-04 and P5 exceeded 1.0 NTU (for which the GCDWQ values refer to post treatment objectives and therefore are not directly applicable to untreated groundwater). The elevated turbidity likely resulted from suspended particulates induced by well purging during the April 27, 2022 sampling event, which in turn likely contributed to the elevated total metals, including concentrations above the AO for total iron (and in some cases total manganese) for these wells. Evidence for this is the total iron value of 0.463 mg/L in the April 27, 2022 sample from P1, when turbidity was 1.02 NTU, versus the total iron value of <0.030 mg/L in the sample from P1 on April 20, 2022 when NTU was <0.10 NTU. The concentrations above the AO for total iron (and manganese) are not necessarily indicative of trends in iron concentrations in the wells. This will be reviewed after the next sampling event is completed in 2023.

The total iron concentrations measured at P5 (4.59 mg/L and 4.37 mg/L in the duplicate) show a significant increase from previous sampling (0.023 mg/L) in 2019 (WWAL, 2021b). As noted above, this is believed to result from the much higher turbidity in the well during recent sampling (37.1 NTU and 31.7 NTU versus 0.16 NTU in 2019), which is likely the result of the well not being in operation.

Figure 4.1 is a semi-log plot that shows the EC data from historical sampling of all monitored wells in the aquifer summarized from the annual aquifer monitoring reports and from the recent sampling events. This includes the current supply well (P1) in addition to all the monitoring wells, some of which are completed in saline water below the aquifer. The long-term sampling results are compared against the operational water quality indicator for EC for P1 (250 µS/cm) (WWAL, 2017), transitional zone between freshwater and seawater (1,000 µS/cm) (based on Klassen et al., 2014), and seawater (~50,000 µS/cm).

Based on these summarized results at the monitoring locations, there are no indications of seawater intrusion occurring due to pumping at P1. The shallow monitoring well M1-S has similar EC as Furry Creek. The slightly higher EC recorded in most of the groundwater samples in Table 4.3 reflects higher TDS in the groundwater relative to the surface water. The elevated EC for M1-D and M2-D is expected because these wells were completed west of the supply wells on the foreshore and at significant depth into the transitional zone between seawater and freshwater to monitor for seawater intrusion. As can be seen from the plot, there are no observable increasing trends in EC in any of the wells over the time period shown.

Figure 4.1. Semi-log plot showing EC Measurements Collected at Furry Creek Supply Wells and Monitoring Wells (2007-present)

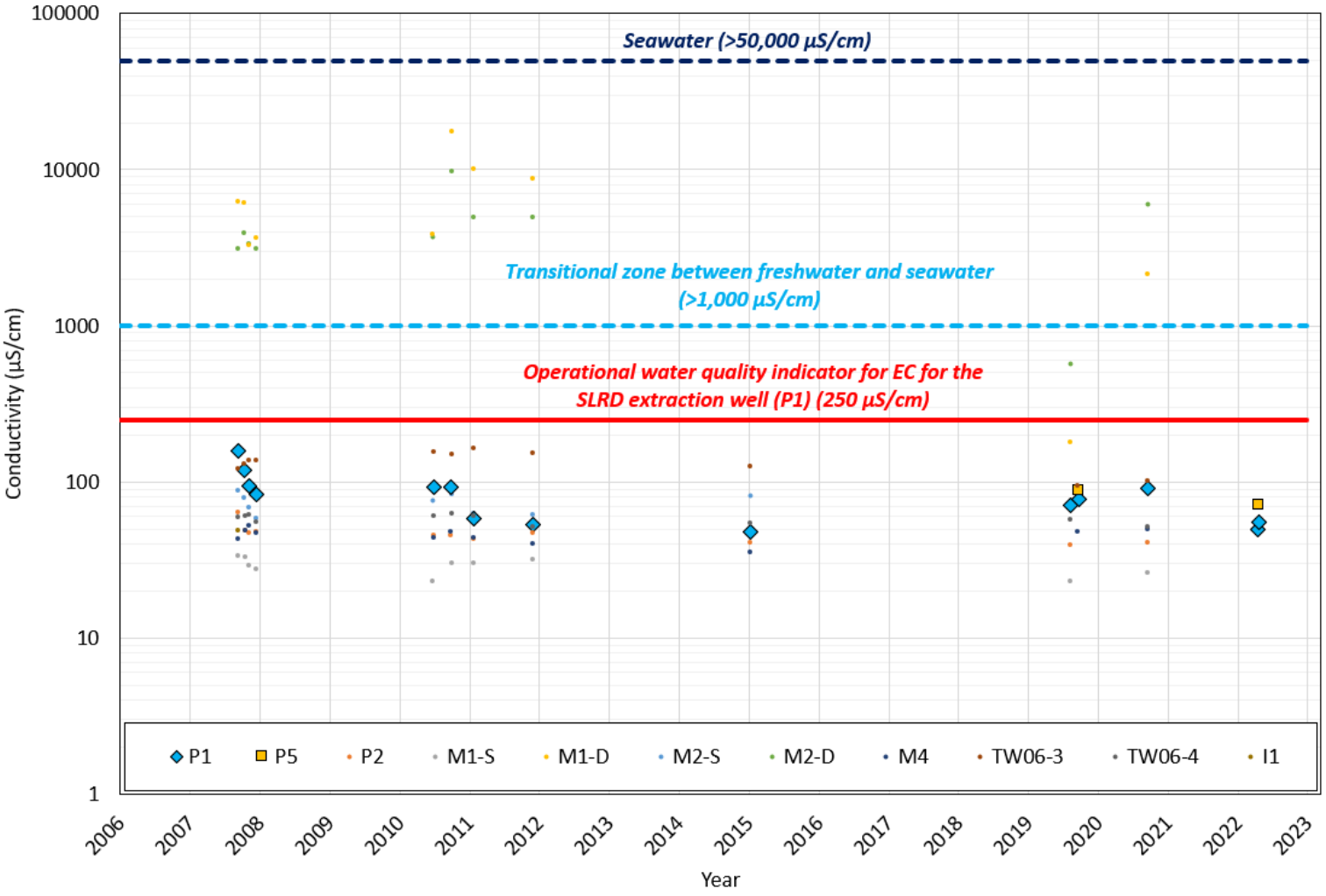


Table 4.3. Water Quality Summary for Select Parameters

	Sample ID:	P1 (SLRD)[4]	P1	TW06-03	TW06-04	P5	P5 (Duplicate)	M1-S	Furry Creek	
Date Samples Collected	dd/mm/yy	20/04/22	27/04/22	28/04/22	27/04/22	27/04/22	27/04/22	28/04/22	28/04/22	
Parameter	**Units**									**Guideline**
Standard Potability										
pH (lab)	pH units	7.36	6.42	6.42	6.52	6.61	6.45	6.4	6.6	AO = 7.0 – 10.5
Conductivity (lab)	µs/cm	49.9	54.7	116	53.9	69.6	71.4	23.8	20.1	-
Turbidity (lab)	NTU	<0.10	1.02	2.89	140	37.1	31.7	0.14	0.13	varies; ≤ 0.3 or ≤ 1.0
Total Dissolved Solids	mg/L	34	32.9	58.4	20.1	40.3	40	13	11.1	AO ≤ 500
Total Hardness, $CaCO_3$	mg/L	18.2	16.8	12.1	17.3	25.3	24.8	8.36	8.01	-
Nitrate, N	mg/L	0.593	0.615	0.821	0.736	0.069	0.068	0.146	0.054	MAC = 10
Chloride	mg/L	1.32	2.17	24.8	2.61	2.92	2.91	1.07	0.26	AO ≤ 250
Sulphate	mg/L	4.23	3.7	<1.0	3.5	1.8	1.8	2.1	2.1	AO ≤ 500
Selected Total Metals										
Aluminum	mg/L	<0.0100	0.0116	0.0142	0.0063	0.0154	0.0183	0.0206	0.0638	MAC = 2.9; OG < 0.1
Calcium	mg/L	5.82	5.24	3.84	5.56	8.42	8.27	2.81	2.74	-
Iron	mg/L	<0.030	0.463	0.799	0.508[3]	4.59	4.37	0.025	0.015	AO ≤ 0.3
Manganese	mg/L	<0.00200	0.00351	0.0285	0.0108	0.0732	0.0724	0.00133	0.0009	MAC = 0.12, AO ≤ 0.02
Zinc	mg/L	<0.0500	0.0069	<0.0040	0.0045	<0.0040	<0.0040	<0.0040	0.0058	MAC = 3[1], AO ≤ 5.0
Glycols										
Propylene glycol	mg/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	≤ 500[2]
Ethylene glycol	mg/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	≤ 192[2]
Diethylene glycol	mg/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-
Triethylene glycol	mg/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-
Selected Pesticides/Fungicides										
Fluopyram	µg/g	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-
Iprodione	µg/g	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Propiconazole	µg/g	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-
Tebuconazole	µg/g	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-
Trifloxystrobin	µg/g	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-

Notes:

All sample results compared to the CDWQG unless otherwise specified.

[1] Source Drinking Water Quality Guidelines (ENV, 2020) for Drinking Water.

[2] Canadian Council of Ministers of the Environment guideline (CCME, 2022) for Aquatic Life – Freshwater

[3] Underlined and green indicates AO is exceeded.

[4] From the 2022 Furry Creek Water Report from the SLRD

Previous work to address the risk to water supply from pesticides used on the golf course was completed by Erdman (2004) and Piteau and Thurber (2007). The laboratory results from the April 27, 2022 sampling event indicate non-detectable concentrations of glycols, and pesticides/fungicides in all samples. This is consistent with the previous results from Piteau and Thurber (2007). Relatively low concentrations of chloride and nitrate in the samples suggests no indication of impact from leaking sanitary lines or fertilizers to the groundwater and surface water.

Previous work to address the risk of acid rock drainage (ARD) contamination to surface water and the aquifer was completed in 1994, 2004 and 2007 (Thurber, 1994; Erdman, 2004; Thurber and Piteau, 2007). The primary indicators for ARD contamination (based on Piteau and Thurber, 2007) include sulphate, calcium, and pH. Results from the April 27, 2022 sampling event compared against values from Piteau and Thurber (2007) are shown in Table 4.4. The laboratory results indicate low concentrations of sulphate and total calcium, and neutral pH, which are consistent with results from previous work. The low concentrations of sulphate and calcium, and near neutral pH values in the groundwater and surface water samples suggest there is no indication of ARD impacts to the groundwater sources.

Table 4.4. Water Quality Summary of ARD Indicators at Furry Creek

	P1	TW06-3	TW06-4	P5	M1-S	Furry Creek
Results from April 2022 sampling event						
Sulphate (mg/L)	3.7	<1.0	3.5	1.8[1]	2.1	2.1
Total Calcium (mg/L)	5.24	3.84	5.56	8.35[1]	2.81	2.74
pH	6.42	6.42	6.52	6.53[1]	6.40	6.6
Results from Piteau and Thurber (2007)						
Sulphate (mg/L)	6.26[2]	<0.50	3.82[2]	-	2.19[2]	1.16 to 5.42[3]
Total Calcium (mg/L)	11.96[2]	5.95[2]	9.19[2]	-	3.40[2]	1.81 to 4.51[3]
pH	6.90[2]	6.77[2]	6.80[2]	-	7.14[2]	6.85 to 7.39[3]

Notes:

[1] Average laboratory results from both samples from P5 collected in April 2022.

[2] Laboratory results from Piteau and Thurber (2007) averaged based on data from between 5 and 9 samples.

[3] Range of values in surface water from Morin (2007) based on laboratory results from 7 samples.

5. MODULE #2: CONTAMINANT SOURCE INVENTORY

As described within the S2TAG, Module #2 comprises a contaminant source inventory which identifies inherent risks to water quality as well as describing land uses, human activities and other potential contaminant sources that could affect source water quality. The term “contaminant source” is defined within the S2TAG to mean both actual/existing and potential sources of contamination.

5.1 Objectives and Methods

The objective of Module #2 is to inventory existing and known potential contamination sources in and around the proposed source protection area and then to summarize what is known about these sites so that the potential risk to drinking water can be assessed further in Module #7. Also, in Module #7 we

assess the existing natural and engineered barriers that are already in place to mitigate risks, as well as the likelihood and consequences of the identified drinking water hazards.

We used the following methods in completing the contamination source survey:

1) A search of iMapBC, which contains information on contaminated sites recorded in the B.C. Site Registry Database;
2) A search of the Federal Contaminated Sites Inventory, which reports suspected, active or closed contaminated sites on federal lands;
3) A review of previous hydrogeological assessment reports;
4) A review of historical aerial photographs for the area;
5) Discussions with TAC members on historical, current and future land uses;
6) A visual survey of areas in and around the source protection area conducted during a site visit on September 15, 2022.
7) A review of records on existing wells in the area.

5.2 Site Registry Database Searches

A search of the iMapBC Environmental Remediation Sites layer, which includes all sites recorded in the B.C. Site Registry Database was completed on August 15, 2022 (Province of British Columbia, 2022). An area search encompassing the entire Aquifer 404 was conducted. Table 5.1 summarizes provincially registered sites identified during the search.

Table 5.1. Summary of Registered Site Search for the Furry Creek Area

Site ID Number	Civic Address	Location Relative to Site	Site Details
5529	Furry Creek, KM 26 – Sea to Sky Highway	375 m and 480 m northwest of P5 and P1, respectively; Downgradient	Oceanside Lands (Furry Creek)
436	-	~7 km northeast of Furry Creek: Britannia Creek Watershed	Britannia Mine Site

Only one identified registered site with ID# 5529 (Oceanside Lands) was located in the search area. This site is within the secondary source protection area (entire extent of the fan), but outside of either primary source protection areas for wells P1 and P5. In addition to being located outside the primary protection area, the registered site is situated downgradient of P1 and P5 with respect to the inferred groundwater flow direction (to the west as stated in Section 2.3). The database did not provide information on the activity that occurred at this site.

Although located significantly outside of the delineated well protection areas, approximately 6.6 km northeast of Furry Creek, WWAL also reviewed search results for registered site ID# 436 (Britannia Mine) as it is a potential future risk to the Furry Creek aquifer through ARD release.

In addition to searching the provincial site registry, WWAL also completed a search of the Federal Contaminated Sites Inventory on August 15, 2022 to identify any federally registered contaminated sites in the area. One closed Federal Contaminated site is mapped just north of the alluvial fan boundary. The site is associated with the Furry Creek Net Pen. A net pen is an enclosed floating cage that is used to hold farmed fish, while allowing water to flow through the pen freely. Based on the location of the registered site and the nature of the activity, WWAL does not consider the site to be a probable source of contamination. Table 5.2 summarizes the details of the site.

Table 5.2. Summary of Federal Contaminated Site Search for the Furry Creek Area

Site ID Number	Civic Address	Reporting Organization	Location Relative to Site	Site Details
00020963	-	Fisheries and Oceans Canada	250 m and 410 m northeast of P5 and P1, respectively; Upgradient	Furry Creek Net Pen - Unassessed

5.3 Review of Historical Air Photos

WWAL obtained historical air photos to review changing land use in and around the site over the past several decades. Table 5.3 summarizes information gleaned from the photos.

Table 5.3. Summary of Air Photos Reviewed

Air Photo Number/ Image Source	Year	Comments
BC200: 3 and 4	1940	Furry Creek area forested and completely undeveloped. No signs of development in surrounding areas. Sea-to -Sky Highway (#99) and Forestry Services Roads east of site are present.
XL38: 39 and 40	1947	No signs of development in Furry Creek area. Some development In Britannia Beach north of site. Britannia Mine is present.
BC1634: 55 and 56	1952	Some forestry activity along Furry Creek shoreline, lumber being stored in the ocean, minimal development. Sea View Drive Road is present. Increased development in Britannia Beach north of site. Some clearing of trees east of site, appears to be a gravel pit.
BC1682: 73	1954	Further forestry and residential development.
BC2349: 9 and 10	1957	No significant changes.
BC5102: 157	1964	Southern portion of the site is cleared for gravel operations
BC7204: 2,3 and 3	1969	Gravel extraction at southern portion of site (west and east of Highway #99). Lumber being stored in the ocean directly north of site.

Air Photo Number/ Image Source	Year	Comments
BC5715: 62, 63 and 64	1976	Lumber previously stored in the ocean north of site moved to being stored in ocean directly off site (near Oliver Landing). Increased clearing of southern and eastern portion of site.
BC82058: 64 and 65	1982	Increased clearing of land directly south of Furry Creek (P1 well location cleared). No other significant changes.
BCC592:	1987	Lumber no longer stored in ocean offshore of site. Development of cleared lands on southern portion of site. Majority of site remains forested and undeveloped.
30BCC94123: 4 and 5	1994	Furry Creek Golf Course and clubhouse are present. Gravel pit operations beginning in gravel pit east of site. Significant development and clearing of land (greens and fairways).
30BCC03040: No. 9 and 10	2003	Residential development in Oliver's Landing (west shore), and just south of site on Ocean Crest Drive. Expansion of gravel pit east of site.
SRS6935: No. 77, 78 and 79	2004	No significant changes.
Google Earth 2022	2022	No significant changes.

5.4 Visual Survey of Source Protection Area

On September 15, 2022, Tim Sivak, P.Geo., of WWAL conducted a visual survey of the site, well heads and surrounding areas to identify any observable risks to the water supply. The site visit was also attended by Edward Witwicki and Sam Thompson, P.Eng. (SLRD), Kevin Healy, P.Eng (CREUS), and Dan Glover (VCH). The weather during the site visit was cool and overcast with rain showers.

Photo 1 shows the location of P5 which is between a paved golf cart trail and the 18th hole fairway on the golf course, approximately 15 m south of Middle Creek. As shown in the photo, the capture zone for the well includes a portion of: the 18th hole fairway, Middle Creek and associated forested area, and the golf course clubhouse. The casing stickup for P5 was 0.61 m (2 ft) above ground surface with a locked well cap.

Based on discussions with Mr. Healy, upgrades to the wellhead for P5 will be prioritized for the proposed development. The casing stickup for P5 will be enclosed in an above-ground concrete vault with lockable access hatch with drainage for the vault, and the surrounding terrain will be graded away from the well prior to the well being activated.

The lots located east and northeast (upgradient) to P5 are owned by private individuals and are currently undeveloped. There is a no disturbance environmental covenant for the southwestern (downgradient) portion of these lots (shown as the shaded green area in Figure 5.2). The closest disturbed area for these lots is approximately ~43 m away from P5 on the north side of Middle Creek. We understand that a resort will also be constructed behind the clubhouse shown in Photo 1 and will be partially located within the primary well protection area.

Photo 1. P5 (circled in yellow), 18th fairway, and golf course clubhouse, looking east. Approximate location of analytical capture zone shown in dashed red line

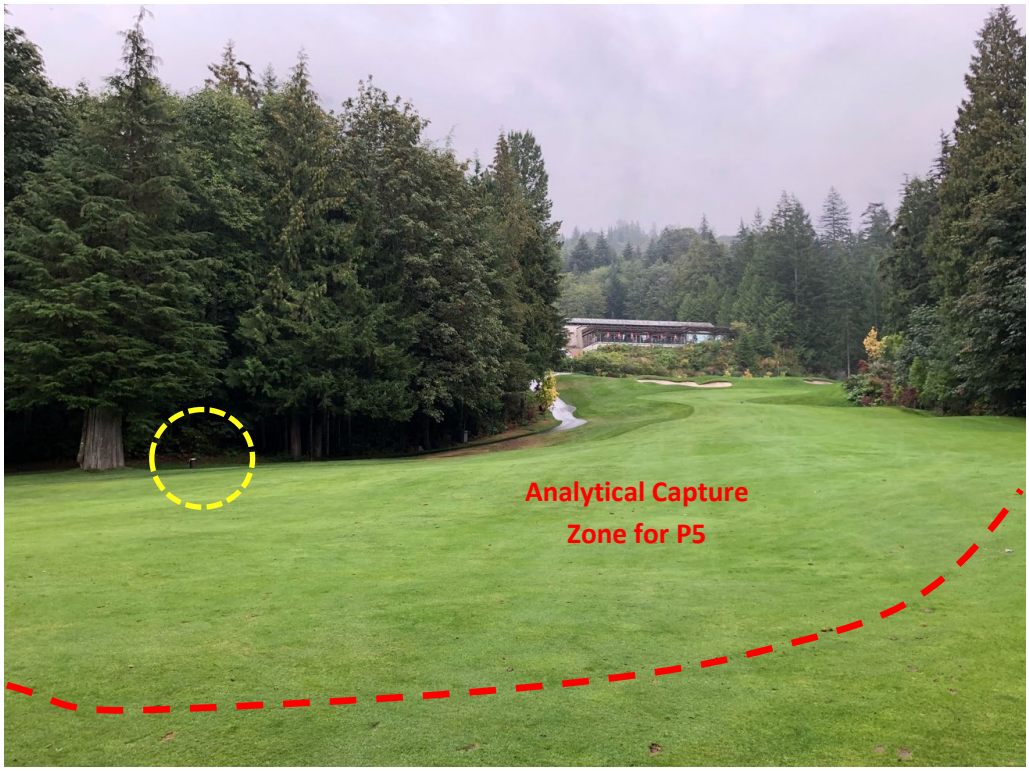
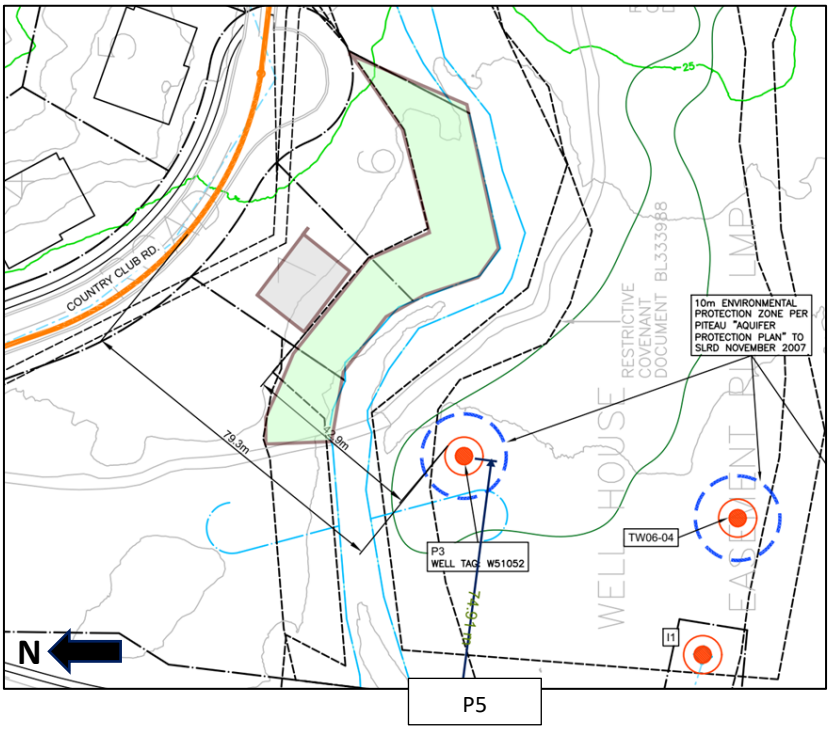


Figure 5.2. No Disturbance Covenant for Residential Lots Upgradient and East of P5



P1 was located in a locked pumphouse on the south side of Furry Creek. The pumphouse was secure with a locked door and security alarm and had a concrete floor. Sodium sulphite tablets and hypochlorite solution were stored in plastic buckets with lids. These are used by the SLRD to chlorinate the raw groundwater produced from P1. The operator will review chlorine containment at P1 to ensure it is not a hazard.

Photo 2 shows the area upgradient of P1 within the analytical capture zone. A portion of the fairway for hole #1 and Furry Creek are located within this area and a pond is located immediately south. The golf course has a surface water license for Furry Creek to irrigate the golf course and pumps the water from the intake along the creek into this pond for storage. Based on discussions with Mr. Healy, the pond has a liner.

Photo 2. P1 looking east along hole #1. Approximate location of analytical capture zone shown in dashed red line. Irrigation pond located south of the capture zone.

During the site visit we also inspected the pumphouse for I1. The door for the pumphouse was open and the wellhead was not secure at the time of the site visit; however, we understand that efforts will be made by Fine Peace to sure that the door remains locked. Other considerations to secure I1 may include installing an alarm for the pumphouse, which we understand is in process (pending availability of a

contractor). The operator will comment on the security of the wells and pumphouses as part of their annual report to the SLRD.

We also inspected the wellheads for TW06-04 and P2 during the site visit. TW06-04 was located in a forested area north of Furry Creek and upgradient of I1. P2 was located in an open area immediately north of P1 and next to Furry Creek. Both P2 and TW06-04 were equipped with dataloggers and monitored as part of the AMP for Furry Creek. TW06-04 and P2 were capped and had casing stick-ups of 0.74 m and 0.20 m, respectively. At P2, a pile of grass plugs from golf course aeration was a few metres from the wellhead.

The well logs for P1 and I1 do not indicate the wells have surface seals. However, the floor of both pumphouses were concrete, which would likely mitigate against any downward flow of contaminants around the outer side of the casings and into the aquifer. It is therefore not currently practical or necessary to install surface seals around either well because of the nature of the wellheads and pumphouses.

5.5 Other Wells in the Source Protection Area

Old or improperly constructed/maintained wells are potential direct pathways for contaminants to get into an aquifer. It is not uncommon for old wells to have been forgotten or buried as properties change hands, and changes in land use or drainage in an area can result in surface runoff draining into an old well. The GWPR requires that unused wells (with no plans for future use) be closed by their owners within 10 years of being no longer used. In our experience, this requirement is not strongly enforced by the Ministry of Forests (MOF) unless there is a complaint, or a specific issue identified.

WWAL conducted a search of the BC Ministry of Environment GWELLS database (ENV, 2022c) and our internal records to identify wells (other than the known monitoring and supply wells) within the proposed protection area and surrounding area that are likely not in use. Based on our review, six wells were previously located within the secondary well protection area south of Furry Creek Based on conversation with Mr. Healy, who has been involved with the Furry Creek development for many years, we understand that the wells were likely abandoned in place. The wells were associated the gravel deposit at Furry Creek, and were drilled between the years of 1961 and 1977. Three of the wells were drilled in 1961 for gravel reserve estimates (Robinson, Roberts & Brown, 1961). The wells were located on a terrace located south of P1 and east of the highway at 58 m (190 ft) and 61.5 m (202 ft) elevation above sea level. This terrace was mined for gravel in the 1960s, and therefore the wells are unlikely to be located because the gravel has been removed

5.6 Input from TAC Members

Members of the TAC met on September 7, 2022 to discuss potential risks to the Furry Creek CWS wells and to provide comments on the proposed source protection area. It was noted that groundwater produced from P1 is currently treated with chlorine and that the groundwater produced from both P1 and P5 to support future development will be treated with chlorine, ultraviolet, and micron filtration. During the PAC meeting there were also discussions regarding fertilizer use on the golf course. The SLRD

requested updates from the golf course regarding their operating practices on an annual basis, including the list of fertilizers and timing of their use on the golf course. These additional reporting requirements are included as recommendations in the SWPP.

Further meetings were also conducted with invitation to the SLRD, VCH, and CREUS. This report reflects the input from meetings with Dan Glover (VCH), Kevin Healy, P.Eng. (CREUS), and Tim Sivak, P.Geo. (WWAL) on November 25, 2022, and the SLRD (Samuel Thompson P.Eng., Edward Witwicki, Claire Dewar), CREUS, and WWAL on December 2, 2022.

5.7 Stormwater and Sewage Disposal

In 2020, CREUS completed a Master Drainage Plan pertaining to the proposed rezoning and development of Furry Creek (CREUS, 2020b). Stormwater management design criteria is presented in the SLRD's Electoral D Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002. The stormwater management criteria described therein are requirements of the Development Permit and subdivision moving forward. The criteria were not in place during the construction of the existing clubhouse, but if the construction of the resort proceeds then the new development will be required to conform with the new criteria. The current minor stormwater system in Furry Creek consists of culverts, pipes, open channels, water courses and flow facilities intended to carry runoff caused by storm events up to a return period of 1 in 10 years. The major stormwater system plan involves overland flow routes, swales, channels, watercourses, roadways, walkways, pathways, and flow control facilities designed to withstand storm runoff events with a return period of 1 in 100 years.

The existing sanitary sewer line for the Furry Creek community is along Country Club Road and is a potential risk for contamination to the groundwater supply should the line rupture or leak. The line conveys sanitary waste from the clubhouse towards Furry Creek Road. An existing wastewater treatment plant, which discharges to Howe Sound, is located downgradient of the wells (~100 m west of Highway #99). The sanitary line is approximately 80 m and 250 m northeast of well P5 and well P1, respectively. Another sanitary line, which conveys waste from the southern properties, runs directly adjacent to P1.

The sanitary lines are considered to pose a low risk to the aquifer in the vicinity of the supply wells, based on the presence of confining clay and till layers that are present overlying the overburden aquifers in areas of the fan, and the likelihood that any potential contaminants leaking from the sanitary lines would flow toward the highway, following the bedding layer for the pipes and topography. The confining layers are likely to act as a barrier to downward migration of groundwater in the area, and as such form a natural layer of protection that inhibits movement of contaminants originating at or near the surface toward the well screens.

5.8 Connection to and Risks Posed by Surface Water

In general, if an aquifer and a stream are hydraulically connected, well pumping may affect the flow in the stream (process known as stream depletion) in one of two ways:

1. By intercepting groundwater that would have eventually made its way to the stream to supply baseflow to the stream (interception); and
2. By causing water in the stream to infiltrate into the aquifer towards the pumping well (induced infiltration or induced recharge).

Barlow and Leake (2012) present and discuss these two processes in detail.

For hydraulic connection to be likely between an aquifer and a stream, there must be an absence of a:

1. Vadose zone (unsaturated zone), and
2. Low-permeability sediments (i.e., till, silt, or clay), beneath the stream (to disconnect the aquifer from the stream).

The presence of a vadose zone or low permeability sediments beneath a stream and above the corresponding aquifer may restrict hydraulic connection and stream depletion along that reach of the stream. Depending on the setting, however, pumping is more likely to affect a connected reach further downstream or down-gradient of the direction of groundwater flow (by the process of interception). Conversely, if a vadose zone or low permeability sediment layer does not underlie a reach of stream, that reach is considered likely to be connected to groundwater.

In the vicinity of P1, Piteau and Thurber (2007) reported a 7.0 m layer of silty clay overlying the sand and gravel aquifer. WWAL (2021b) described the aquifer in the vicinity of P5 to be overlain by 12.2 m of gravel (boulders), interpreted by WWAL to be till based on cross-sections from Piteau and Thurber (2007) and the well logs.

We also evaluated the presence of a vadose zone under nearby Furry Creek and Middle Creek by comparing groundwater elevations with the approximate elevations of the creeks. The elevations of Furry Creek and Middle Creek at their closest points to P1 and P5 are 8 m asl and 15 m asl, respectively. Table 5.4 shows that the groundwater elevations at P1 and P5 range between about -2.2 to 3.6 m asl, and 2.6 to 4.6 m asl (based on two partial years of data), respectively. Based on these data, a vadose zone between about 5 and 10 m thick is present between surface water and groundwater near the supply wells.

Table 5.4. Range of Groundwater Elevations Recorded at P1 and P5 from 2007 to 2021

Year	Range in groundwater elevations			
	P1 (masl)		P5 (masl)	
	Min	Max	Min	Max
2007	-1.6	3.3	-	
2008	-2.2	2.8	-	
2010	-0.8	3.6	-	
2011	-0.5	3	-	
2012	-1	3	-	
2019	0.5	2.0	-	
2020	-1.0	3.1	2.8[1]	4.6[1]

Year	Range in groundwater elevations			
	P1 (masl)		P5 (masl)	
	Min	Max	Min	Max
2021	-2.0	3.0	2.6[2]	4.6[2]

Notes:
[1]January 1, 2020 to July 20, 2020
[2]June 26, 2021 to December 31, 2021

Considering the sequences of till-like confining sediments overlying the aquifer and the presence of a relatively thick vadose zone (deep non-pumping groundwater levels), a direct hydraulic connection between the supply wells and nearby surface water is unlikely. We also note that the 48-hour and 72-hour pumping tests conducted on P5, and on P1 and P5 (simultaneously), respectively, did not impact the surface water levels in Middle Creek (WWAL, 2021b).

In addition to providing a hydraulic barrier, the confining layers overlying the productive aquifer and the unsaturated zone between the surface water and groundwater serve to mitigate against the vertical infiltration of contaminants into the aquifer.

5.9 Zoning in the Source Protection Area

Rezoning and expansion of the Furry Creek community consistent with the original PLA (920 dwelling units) is being incorporated into the formal rezoning proposed by Fine Peace. Fine Peace initially applied for rezoning in 2018 and has had multiple readings since. Adjustments to the rezoning application have been made through reading inputs and public outreach. The existing zoning in Furry Creek, and the proposed zoning within the primary and secondary well protection areas are summarized in Table 5.5.

The conceptual land use plan outlining the existing and proposed zoning areas, prepared by CREUS, is attached to this report for reference (CREUS, 2020a). Note that the rezoning extends east, outside of the secondary well protection areas.

Table 5.5. Furry Creek Zoning within Primary and Secondary Well Protection Areas (based on CREUS, 2020a)

Existing Zoning (920 dwelling units)	Proposed Zoning (920 dwelling units)	
	Secondary Well Protection Area	Primary Well Protection Area
FCC1: Commercial / residential **FCC2:** Golf course commercial **FCR1:** Marina residential **FCR3:** Residential – single family / duplex	**FCC2:** Proposed golf course **P1:** Park **OS1:** Open space **P2:** Community administration and utility **C1:** Proposed village commercial (up to 3 stories) **RH:** Proposed resort and hotel (up to 6 stories) **R1:** Residential – single family and duplex **R2:** Residential – stacked townhouses **R3:** Low rise residential – apartments (up to 4 stories) **R3C:** Low rise residential w/ commercial on main floor **RTA1:** Residential / hospitality (up to 4 stories) **RTA2:** Residential / hospitality (up to 6 stories) **R4:** Mid-rise residential – apartments (up to 6 stories) w/ commercial **R5:** Mid-rise – apartments (up to 8 stories) **R6:** Mid-rise residential – apartment (up to 10 stories) **R7:** High rise residential – apartments (up to 15 stories) **OS1:** Future study area within public open space	**FCC2:** Proposed golf course **P1:** Park **OS1:** Open space **P2:** Community administration and utility **R3:** Low rise residential – apartments (up to 4 stories) **RTA1:** Residential / hospitality (up to 4 stories) **R4:** Mid rise residential – apartments (up to 6 stories) w/ commercial **RH:** Proposed resort and hotel (up to 6 stories) **R**5: Mid rise – apartments (up to 8 stories) **FCR3:** Residential – single family / duplex

The lands east and upgradient of wells P1 and P5, located in the primary well protection area, are the primary areas of concern associated with rezoning. Based on the zoning information provided by CREUS, the primary well protection area for P1 will primarily remain as golf course commercial and the clubhouse may potentially be rezoned as resort and hotel. The proposed rezoning and development within the primary well protection area are considered low risk and are not expected to cause detrimental impacts on the quality of the source water for the Furry Creek's CWS as, other than a period where construction activities will commence, no long-term high-risk activities are planned to take place within the rezoned areas.

All new works are required to be designed as per the Master Water Plan, Master Drainage Plan, and Master Sanitary Plan in addition to the new Development Permit requirements and Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002.

5.10 Climate Change Effects

Climate change is an ongoing process and its effects on the region should be monitored by the SLRD. The forecasted outcomes for the study region are warming temperatures across seasons in addition to longer, drier summers and wetter winters with more precipitation falling as rain at lower elevations. There is also a predicted overall hydrologic transition from snowmelt-dominant watersheds to rainfall-dominant, increased the need for water conservation and storage (Metro Vancouver, 2016). Both ocean surge and river flooding events could increase in magnitude and frequency, with an increase in the need for flood protection infrastructure. Reduced low flows and increased water demand due to hot conditions could affect local groundwater levels during peak demand periods (PCIC, 2022).

Sea level is likely to rise by a significant amount by 2100. In 2011, municipalities were advised to plan for 1 m of sea level rise by 2100, and 2 m by 2200 (Metro Vancouver, 2016). Sea level rise is caused by:

- Thermal expansion of water due to climate induced warming of oceans;
- Melting of major stores of ice;
- Changes in ocean circulation; and,
- Land subsidence.

Along the coast, discharging fresh groundwater comes into contact with seawater. This interface between the freshwater and sea water typically exists under a state of dynamic equilibrium, where discharging groundwater prevents the seawater from intruding landward. Groundwater pumping and sea level rise reduce the natural hydraulic head and, consequently, the groundwater discharge to the ocean. Sea level rise will decrease the hydraulic gradient for Aquifer 404 by reducing the difference in vertical head from the apex of the fan to Howe Sound. This could result in a landward migration of seawater/freshwater interface, due to the reduced head differential. Sea level rise and flood protection are requirements for the development permits on both the foreshore and the creeks within the site. Foershore work will involve placing clean compacted fill to achieve acceptable habitable levels.

5.11 Summary of Groundwater Contamination Source Inventory

The results of the contamination source inventory are presented in Table 5.6 and the locations of potential contamination sources discussed are shown in Figure 5.1.

Table 5.6. Potential Groundwater Contamination Sources/Hazard ID Inventory

Hazard Reference No.	Contaminant Source type and Description	Location	Approx. Distance to Source	Possible Contaminants of Concern	Contaminant Transport Method	Associated Barriers
1	Furry Creek Rezoning	The lands east and upgradient of P1 and P5, and throughout the primary and secondary well source protection areas.	0 – 1 km	Spills and leaks of hydrocarbons, heavy metals and other hazardous substances (e.g., paints, oils, adhesives etc.) used in construction activities.	Infiltration through unsaturated soil, runoff then groundwater transport through shallow aquifer, or spills into Middle Creek or Furry Creek which may recharge aquifer along reaches of the streams if the confining layer is absent.	Attenuation and retardation of transport through unsaturated soils. Confining unit overlying aquifer. Direct hydraulic connection between the supply wells and nearby surface water is unlikely.
2	Fertilizers and other products used on Furry Creek Golf Course	The lands east and upgradient of P1 and P5, and throughout the primary and secondary well source protection areas.	0 – 1 km	Nitrate/nitrite, fungicides, herbicides, plant regulators, and glycols.	Infiltration through unsaturated soil, runoff then groundwater transport through shallow aquifer.	Attenuation and retardation of transport through unsaturated soils. Confining unit overlying aquifer.
3	Transportation corridors and potential releases	Highway 99	40 m west of P1 and 120 m west of P5	Hydrocarbon release from vehicle leaks and accidents, larger scale release associated with tanker trucks, road salts.	Infiltration through unsaturated soil, runoff then groundwater transport through shallow aquifer.	Attenuation and retardation of transport through unsaturated soils. Confining unit overlying aquifer.
4	Contaminants introduced into existing used or unused wells, or well casings acting as preferential contamination pathways	Wells not used for aquifer monitoring or supply.	I1: 95 m north of P1 and 90 m southwest of P5	Fecal coliforms, viruses, and nutrients (e.g., nitrate/nitrite).	Short-circuiting from surface to aquifer into or along well casing, then groundwater flow.	Confining unit overlying aquifer, very few wells are reported in the area and all known wells are monitored.
5	Metal contaminations from surface water associated with legacy mining impacts	Britannia Mine portals located in Furry Creek watershed.	Middle Creek: 190 m north of P1 and 15 m northeast of P5	Sulphate, calcium (low pH), total metals	Portals to Britannia Mine located within Furry Creek Watershed. Potential pathways for ARD should drainage patterns alter over time.	Confining unit overlying aquifer. Direct hydraulic connection between the supply wells and nearby surface water is unlikely.

Hazard Reference No.	Contaminant Source type and Description	Location	Approx. Distance to Source	Possible Contaminants of Concern	Contaminant Transport Method	Associated Barriers
			Furry Creek: 30 m north of P1 and 100 m south of P5		Infiltrating the underlying aquifer (losing stream).	
6	Nearby sanitary infrastructure	Throughout the primary and secondary well source protection areas.	80 m and 250 m northeast of P5 and P1; directly adjacent to P1	Fecal coliforms, viruses, nutrients (e.g., nitrate/nitrite), chloride (as an indicator)	Infiltration through unsaturated soil, runoff then groundwater transport through shallow aquifer.	Confining unit overlying aquifer. Sewerage treatment plant and effluent disposal situated downgradient from supply wells.
7	Climate change / saltwater intrusion	Throughout the primary and secondary well source protection areas.	Position of saltwater wedge fluctuates seasonally and with tides.	Chloride, sodium from seawater intrusion	Sea level rise will decrease the hydraulic gradient for Aquifer 404 and could result in the landward migration of the seawater/freshwater interface (inducing saltwater intrusion).	Source protection, water monitoring

6. MODULE #7: CHARACTERIZE RISKS FROM SOURCE TO TAP

Module #7 of the S2TAG is a key step in the source-to-tap assessment process. The purpose of the module is to integrate all of the water system vulnerabilities into a comprehensive assessment of the major water supply elements and the system as a whole.

Module #7 focuses on quantifying the level of risk for each hazard by defining the likelihood that a hazard will occur and the severity of the outcome in light of the existing source water protection measures and treatment barriers. For example, an event with a low likelihood but a catastrophic outcome can be qualified as a high risk, while at the same time an event with a high likelihood but minor consequences can also be qualified as a high risk. The risk analysis generally focuses on the hazards and vulnerabilities developed in Modules #1 and #2. Where relevant, vulnerabilities have been added in Module #7 relating to water system supply, operation and management.

6.1 Objective and Methodology

Module #7 assigns a level of risk to the hazards and vulnerabilities of the water system. As prescribed in the S2TAG, each hazard is given a likelihood and a consequence ranking to allow for development of a level of risk.

Likelihood is defined as the probability that a hazardous event will occur. A risk may be unlikely in the short term and very likely in the long term, therefore it is useful to provide a timeline on which to assess the likelihood. For this analysis we will use a timeline of 10 years. Table 6.1 (from the S2TAG) presents the likelihood rankings from 'A' to 'E'.

Table 6.1. Levels of Likelihood Description

Level	Descriptor	Description	Probability of Occurrence in Next 10 Years
A	Almost certain	Is expected to occur in most circumstances	> 90%
B	Likely	Will probably occur in most circumstances	71-90%
C	Possible	Will probably occur at some time	31-70%
D	Unlikely	Could occur at some time	10-30%
E	Rare	May only occur in exceptional circumstances	< 10%

Consequence is defined as the severity of the outcome of a hazardous event. The severity can be based on the size of the population affected, the impact to the population affected, or the impact to water system equipment and operation. Table 6.2 (from the S2TAG) presents levels of consequence from 1 to 5.

Table 6.2. Relative Levels of Consequence Description

Level	Descriptor	Description
1	Insignificant	Insignificant impact, no illness, little disruption to normal operation, little or no increase in normal operating costs.
2	Minor	Minor impact for small population, mild illness moderately likely, some manageable operation disruption, small increase in operating costs
3	Moderate	Minor impact for large population, mild to moderate illness probable, significant moderation to normal operation but manageable, operating costs increase, increased monitoring
4	Major	Major impact for small population, severe illness probable, systems significantly compromised and abnormal operation if at all, high level monitoring required
5	Catastrophic	Major impact for large population, sever illness probable, complete failure of systems

The risk of a hazard is developed from the likelihood of its occurrence and the severity of the consequence. Table 6.3 (from the S2TAG) is the risk matrix used to determine risk based on likelihood and consequence rankings.

Table 6.3. Qualitative Risk Analysis Matrix

Likelihood	Consequences				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
A (almost certain)	Moderate	High	Very High	Very High	Very High
B (likely)	Moderate	High	High	Very High	Very High
C (possible)	Low	Moderate	High	Very High	Very High
D (unlikely)	Low	Low	Moderate	High	Very High
E (rare)	Low	Low	Moderate	High	High

6.2 Protection Barriers

A key to defining risks to the water system is understanding the existing barriers in place that protect the it and water users from each hazard. Barriers are categorized as 'existing' (i.e., should be maintained), 'review existing' (the barrier should be updated or revisited, see Module #8) or 'ongoing' (the barrier requires continued administrative involvement from the SLRD or others). The barriers present for the Furry Creek CWS are as outlined in Table 6.4.

Table 6.4. Existing Water System Barriers

Treatment
▪ **Natural Attenuation:** (existing) the natural removal/dilution of contaminants prior to reaching the source extraction point. This generally occurs when deleterious constituents are stripped from runoff as it travels overland or through the ground. It may also include other factors such as settlement of heavy particulate in waterbodies or pathogens dying prior to reaching the extraction point. Natural attenuation is considered a barrier to all hazards presented in Table 5.6.
Monitoring/Management/Training
▪ **Water Quality Monitoring:** (ongoing) allows for reaction to changing conditions in raw water quality, adjustment to treatment processes and changing source waters if needed. ▪ **Water System Maintenance:** (ongoing) preventative maintenance and proactive asset management will reduce the likelihood of failure for water system components and reduce long term water system operation and renewal costs. ▪ **Operator Training:** (ongoing) operator certification and training is a regulatory requirement and will help prevent errors in water system operation. ▪ **Source Water Protection Plan Review:** (ongoing) allows for yearly review of recommended actions to promote source water protection
Policy/Regulation (Source Protection)
• **Emergency Response Plan (ERP):** (existing/ongoing) an effective emergency response may mitigate the potential impacts on the water system before the water system is put at risk. An emergency response plan is required to address all potential hazards. The SLRD has an ERP that provides a course of action should contamination of a water supply source occur. • **Law Enforcement:** (ongoing) protection against prohibited activities in the watershed that could include dumping, forestation, or vandalism. • **Land Use Zoning and Permitting:** (ongoing) these are barriers to hazardous activities in the assessment area. The SLRD should be involved in future decisions that could impact the water source.
Public Awareness
• **Public Education:** education informs the public and stakeholders of responsible watershed use and good practices. This includes placing additional signage to inform the public and stakeholders when they are within the bounds of the source protection areas, and providing regular community updates as they pertain to source protection.

6.3 Risk Characterization of Groundwater Sources

Table 6.5 presents the Risk Characterization Summary for the potential drinking water hazards identified for the proposed groundwater source protection area. The level of risk for most of the identified hazards range from low to moderate.

Table 6.5. Risk Characterization Summary Furry Creek CWS Groundwater Source

Hazard Reference No.	Drinking Water Hazard	Likelihood Level (from Table 6.1)	Consequence Level (from Table 6.2)	Risk Level (from Table 6.3)	Comments
1	Furry Creek Rezoning	C	1	Low	Moderate likelihood that rezoning poses an additional risk to the wells. The consequence is considered low and the risk is further mitigated by presence of overlying confining layer protecting aquifer. Rezoning development will occur over time. The annual aquifer monitoring will be reviewed against the ongoing development, and commented on in the annual aquifer monitoring reporting.
2	Fertilizers used on Furry Creek Golf Course	D	3	Moderate	Low likelihood further mitigated by presence of overlying confining layer protecting aquifer.
3	Transportation corridors and potential releases	C	1	Low	Moderate likelihood further mitigated by presence of overlying confining layer protecting aquifer and Highway 99 being located downgradient of both supply wells within the secondary well protection area.
4	Contaminants introduced into existing used or unused wells, or well casings acting as preferential contamination pathways	E	3	Moderate	Very low likelihood further mitigated by presence of overlying confining layer protecting aquifer.
5	Metal contaminations from Furry Creek associated with legacy mining impacts	D	3	Moderate	Low likelihood further mitigated by presence of overlying confining layer protecting aquifer and

Hazard Reference No.	Drinking Water Hazard	Likelihood Level (from Table 6.1)	Consequence Level (from Table 6.2)	Risk Level (from Table 6.3)	Comments
					unlikely direct hydraulic connection between the supply wells and nearby surface water.
6	Nearby sanitary infrastructure	C	3	High	Moderate likelihood further mitigated by presence of overlying confining layer protecting aquifer and treatment of supply.
7	Climate Change / Saltwater Intrusion	C	4	High	Sea level rise will decrease the hydraulic gradient for Aquifer 404 and could result in the landward migration of the seawater/freshwater interface (inducing saltwater intrusion).

Overall, the confined nature of the aquifer provides inherent source protection. For most drinking water hazards identified, the risk to the drinking water source is considered low to moderate, except for leaking nearby sanitary infrastructure and seawater intrusion which are considered high. The likelihood ratings are considered conservative because the confining layers mitigate against the occurrence of the drinking water hazard (where present).

The aquifer monitoring plan at Furry Creek is operated specifically to monitor for seawater intrusion, as an early detection system from monitoring wells located on the foreshore, and ongoing monitoring of the pumping wells. Mitigative actions to reduce the risk to the aquifer from climate change/seawater intrusion may include: planning alternate water sources to supply the system (i.e., surface water from Furry Creek, groundwater from a well completed in a different part of the aquifer that hasn't been impacted by seawater intrusion) until salinity declines, and/or management actions such curtailing groundwater pumping.

7. MODULE #8 RECOMMENDED ACTIONS TO PROMOTE SOURCE WATER PROTECTION

Table 7.1 below provides a comprehensive listing and summary of recommendations for the water system. This table suggests timelines and is also organized with priorities and coordination tasks highlighted. Recommended actions and strategies moving forward to promote protection of the groundwater source include:

1. All subdivision applications for Furry Creek that are located within or partially within the primary and/or secondary source protection areas should be reviewed as follows:

a. By a Civil Engineer to confirm that the works are consistent with the recommendations of the Master Water Plan and Master Drainage Plan as it relates to protecting source water;
b. By a Professional Geoscientist or Engineer proficient in hydrogeology and/or hydrology, to confirm the works are consistent with the obligation and intent of the Source Water Protection Plan.

The Professional will also provide any recommendations for covenants required post-subdivision to ensure the built form of the proposed development is also consistent with this report recommendations.

2. The golf course will provide the operator with an annual report that summarizes their operating practices. The report should include the following:
    a. Summary of fertilizers and pesticides applied on the golf course and the timing of their use. It's understood that the operator and golf course will move towards alternate natural options that pose less risk to source water.
    b. Documentation on how and where the fertilizers and pesticides are stored;
    c. Emergency response plans for spills; and,
    d. Documentation on inspections that have occurred.

3. The operator will comment on the security of the wells and pumphouses as part of their annual report to the SLRD. The inspected supply wells and dates of the inspections should be documented in a checklist by the operator, and included in the annual reporting to the SLRD. We understand that an alarm will be installed at the pumphouse for I1 by the end of 2022 (pending contractor availability).

4. Continue the current sampling program for the water system consisting of bacteriological water quality monitoring (8/month) and annual sampling for comprehensive water quality as per VCH conditions on the Operating Permit. Develop a response procedure should unexpected results be found (e.g., an increase in a drinking water parameter previously not found or previously found below guidelines).

5. Revise the current AMP to include monitoring and sampling of P5. Continue the monitoring program as per the AMP, requiring ongoing monitoring and sampling to mitigate the risk of seawater intrusion in the aquifer, and an annual report summarizing the data collected throughout the monitoring period.

6. As requested by the TAC, incorporate annual sampling of the supply wells to target the impacts of fertilizer used on the Furry Creek Golf Course and metal contaminants from Furry Creek associated with legacy mining impacts on the aquifer. Sampling should be conducted in the dry season when groundwater levels are lowest. Review the results and frequency of testing after 5 years of monitoring and determine if any adjustments are needed. This process was followed on original commissioning, but is reinstated here to reflect the change in schedule.

7. Continue to meter and track water volumes extracted from P1. Meter and track water volumes for P5 when it is put into operation. Water usage data would be necessary to detect leakage in the distribution system and support any water conservation efforts undertaken. Compare the water usage data to the maximum diversion quantity authorized by the groundwater license for P1.

8. Determine the future plans of I1. Should this well continue to go unused for supply or aquifer monitoring, formally close the well in accordance with the GWPR.

9. Extend the well casing stickup for P2 so it is minimum 30 cm above the ground surface to meet the minimum requirement of the GWPR. During any modifications to the other wells (e.g., for well head completion), a minimum well casing stickup of 30 cm must be maintained.

10. Secure the wellhead for P5 once it is put into operation to protect the well against vandalism (e.g., enclosing it in a lockable above-ground vault as proposed), and ensure that the nearby terrain is sloped away from the wellhead.

11. Remove the pile of grass plugs placed around the wellhead for P2 and do not temporarily or permanently store chemicals, petroleum products, fertilizers, pesticides, herbicides, pains, salt or any other deleterious substance that could contaminate the water supply within 15 m of the well heads. We understand that this work is in progress, to be completed in 2022.

12. Add signage at the entrance(s) to the community boundary visible to incoming traffic, indicating that drivers are entering a groundwater protection zone.

13. Develop an educational handout that can be mailed to residents informing them of the nature of their water supplies and steps they can take to help protect groundwater quality.

    During development, complete activities in a manner that protects the natural environment and follows best management practices as outlined in Develop with Care: Environmental Guidelines for Urban and Rural Land Development (Government of British Columbia, 2014) and Natural Resource Best Management Practices (Government of British Columbia, 2022). Practice proper handling, disposal and storage of fuels and hazardous substances within the well protection areas during construction. This will be included in the construction tender documents. The golf course, commercial, and residential operations will follow the intent of these guidelines at all times.

14. Review this SWPP report on an annual basis, and revise the recommended actions to promote source water protection as needed.

Table 7.1. Overall Recommendations for the Furry Creek CWS

No.	Recommendation	Description	Risks Addressed	Barriers Enhanced	Responsible Party	Priority/ Timeline
Treatment / Supply						
1	Treatment	Water from the wells is treated with chlorine at the water treatment plant before it is distributed to the community. **Actions:** • Improve the treatment system(s) to include ultraviolet, and micron filtration to support the development on the fan and to address risk 6 outlined in Table 6.5 above.	6	Treatment	SLRD / Operator	Ongoing as the development proceeds
Monitoring/Management						
2	Water Quality Monitoring	Water quality monitoring allows the water system to react to changes in raw and treated water quality. **Actions:** • Continue water quality monitoring as per the existing VCH Operating Permit. • Continue to monitor the groundwater source yearly for chemical and physical drinking water parameters. • Continue water quality monitoring for seawater intrusion as per the AMP. • Incorporate water quality monitoring of supply wells for fertilizers used on the Furry Creek Golf Course and ARD impacts on an annual basis targeting the dry season for sampling when water levels are lowest. Review after 5 years of monitoring and adjust sampling frequency as needed.	All	Treatment	SLRD	High / Periodically review existing
3	Operator Training	Certified operators are a regulatory requirement for water system operation. **Actions:** • Maintain operator training as required by the Operating Permit.		Operator Training	SLRD / Operator	Low / Maintain training

No.	Recommendation	Description	Risks Addressed	Barriers Enhanced	Responsible Party	Priority/ Timeline
4	Preventative Maintenance and Asset Management	Preventative maintenance is the performance of regular and scheduled maintenance on the water system to prevent failure of infrastructure and includes replacing infrastructure at the end of its life. Asset management is a broad term for tracking, operating, maintaining, upgrading, renewing and disposing of assets effectively. AWWA Manual M5 (American Water Works Association (AWWA), 2017) is a useful resource. **Actions:** • Provide regularly scheduled maintenance for infrastructure. • Renew infrastructure at the end of life. • Perform inspection of equipment and infrastructure to effectively deploy resources. • Periodically review water rates. • Review system capacities as population and water demands increase (treatment capacity, piping capacity, storage capacity, etc.). • Effective management of other utilities will help safeguard the water system. • Review the SWPP framework identified in this report on an annual basis, and revise this report as needed. • Determine the specific capacity (water level drawdown/pumping rate) on an annual basis and review with a qualified professional to predict the need for well maintenance. Well performance has not been assessed since 2002.		Water System Maintenance	SLRD / Operator	Low / Maintain existing
Policy/Regulation						
5	Coordinate with Other Entities in the Assessment Area	The SLRD is not the only governmental body and private owner with land use in the secondary protection area. **Action:** • Coordinate with RCMP and Ministry of Transportation and Infrastructure (MOTI) regarding transportation corridors. The SLRD should request notification of any risks or events. • Coordinate with the MOF to: 1) acquire Material Safety Data Sheets for fire retardant and any other chemicals used when combating wildfires; and 2) request notification when hazards or events are identified in the protection area. • Coordinate with the Furry Creek Golf Course to supply the list of fertilizer products and schedule of application to the SLRD on an annual basis.	2-6	N/A	SLRD	High / < 1 year

No.	Recommendation	Description	Risks Addressed	Barriers Enhanced	Responsible Party	Priority/ Timeline
6	Emergency Response Plan	The Emergency Response Plan is a regulatory requirement. **Actions:** • Update the emergency Response Plan as needed to include protection of water system during an emergency. • Coordinate with MOTI and MOF. The SLRD should be notified of any hazardous events or spills.	All	Emergency Response Plan	SLRD	High / < 2 years
7	Law/Bylaw Enforcement	Law/bylaw enforcement can help prevent hazardous activities in the protection area including illegal dumping, or other prohibited activities. **Actions:** • Coordinate with RCMP and bylaw enforcement: 1) ensure laws/bylaws are enforced; 2) agencies to notify the SLRD of hazardous events so appropriate measures can be taken.	1 & 5	Law Enforcement	SLRD	Low / Ongoing
8	Governmental Involvement	Continue to involve the SLRD in policy, bylaw and permit development to safeguard the water system and water source. **Actions:** • Prevent or limit industrial/commercial operations within the assessment area.	1	Land Use; Permitting	SLRD	Low / Ongoing
9	Reporting to Vancouver Coastal Health Authority	Vancouver Coastal Health required reporting. **Actions:** • Provide reports to VCH as required by the Operating Permit.	All	N/A	SLRD	Low / Ongoing
Public Awareness						
10	Public Education	Public education will promote responsible actions in the protection area. **Actions:** • Provide public education on the SLRD's website regarding water supply protection topics such as household and yard chemicals, proper waste disposal, action in the event of a spill, general recreational use etc. • Provide open houses to inform the public and stakeholders.	1, 4 & 5	Public Education	SLRD	Medium / < 2 years

No.	Recommendation	Description	Risks Addressed	Barriers Enhanced	Responsible Party	Priority/ Timeline
		• This is an opportunity to add public education information regarding efficient water use in the home and the yard.				
11	Signage	It is common practice to install warning signs in protection areas as well as general awareness-raising signs in a variety of environmental protection zones. This serves to notify public of the well location to prevent accidental damage and promote responsible activity in the area. **Actions:** • Install "entering groundwater protection zone" signage on main roads leading through protection areas	1,2,4 & 5	Public Education	SLRD	Medium / < 2 years

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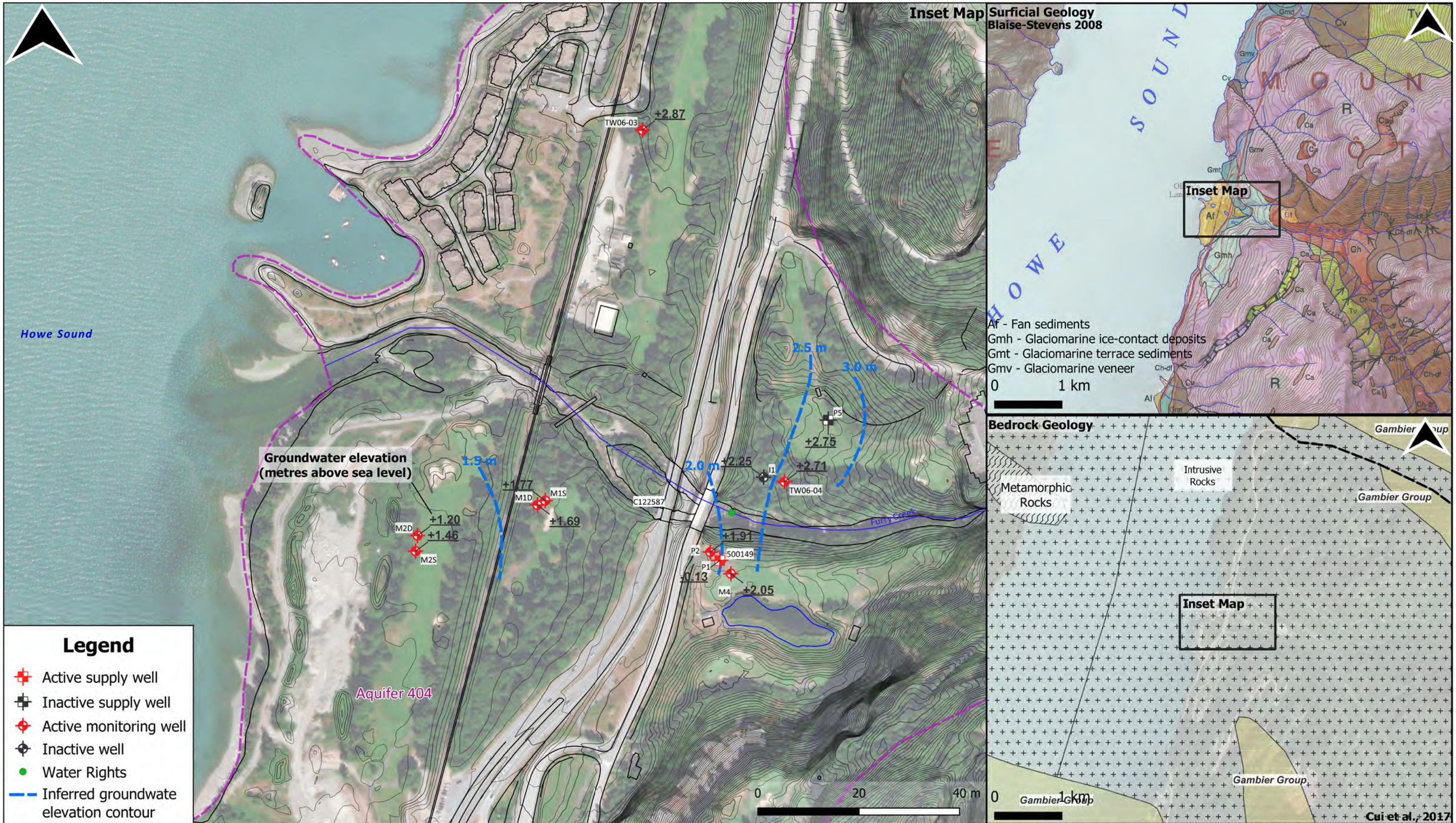
Furry Creek Source Water Protection Plan

TITLE **Figure 2.1:** Furry Creek and Surrounding Area

western water ASSOCIATES LTD

DRAWN Morgan Jackson, GIT	DATE August 24, 2022	CLIENT Fine Peace Furry Creek Development Ltd. C/O CREUS Engineering Ltd.
REVIEWED Tim Sivak, P.Geo.	PROJECT NO. 22-107-01VC	REVISION NO. B



Furry Creek Source Water Protection Plan

western water ASSOCIATES LTD

TITLE **Figure 3.1:** Hydrogeological Setting

DRAWN	DATE	CLIENT
Morgan Jackson, GIT	August 25, 2022	Fine Peace Creek Development Ltd. C/O CREUS Engineering Ltd.
REVIEWED	PROJECT NO.	REVISION NO.
Tim Sivak, P. Geo.	22-107-01VC	C

Data Sources: Base plan from publicly available data sources.

Contour interval: 5 m
Map Projection: NAD83/UTM Zone 10N
Other notes: Registered Well Identified by Well Tag Number (WTN), Water Rights Identified by Licence Number, Aquifer Identified by Aquifer Number

Overview Map

Britannia Creek Watershed

Inset Map

Furry Creek Fan

Furry Creek Watershed

0 1 km

Inset Map

Howe Sound

TW06-03

P5

TW06-04

I1

M1D

M1S

M2D

M2S

P2

P1

M4

1-year TOT

Primary Source Protection Area

Secondary Source Protection Area

0 250 500 m

Legend

- Active supply well
- Inactive supply well
- Active monitoring well
- Inactive well
- Analytical Equation Capture Zones for P1 and P5
- Primary Source Protection Area
- Secondary Source Protection Area

Furry Creek Source Water Protection Plan

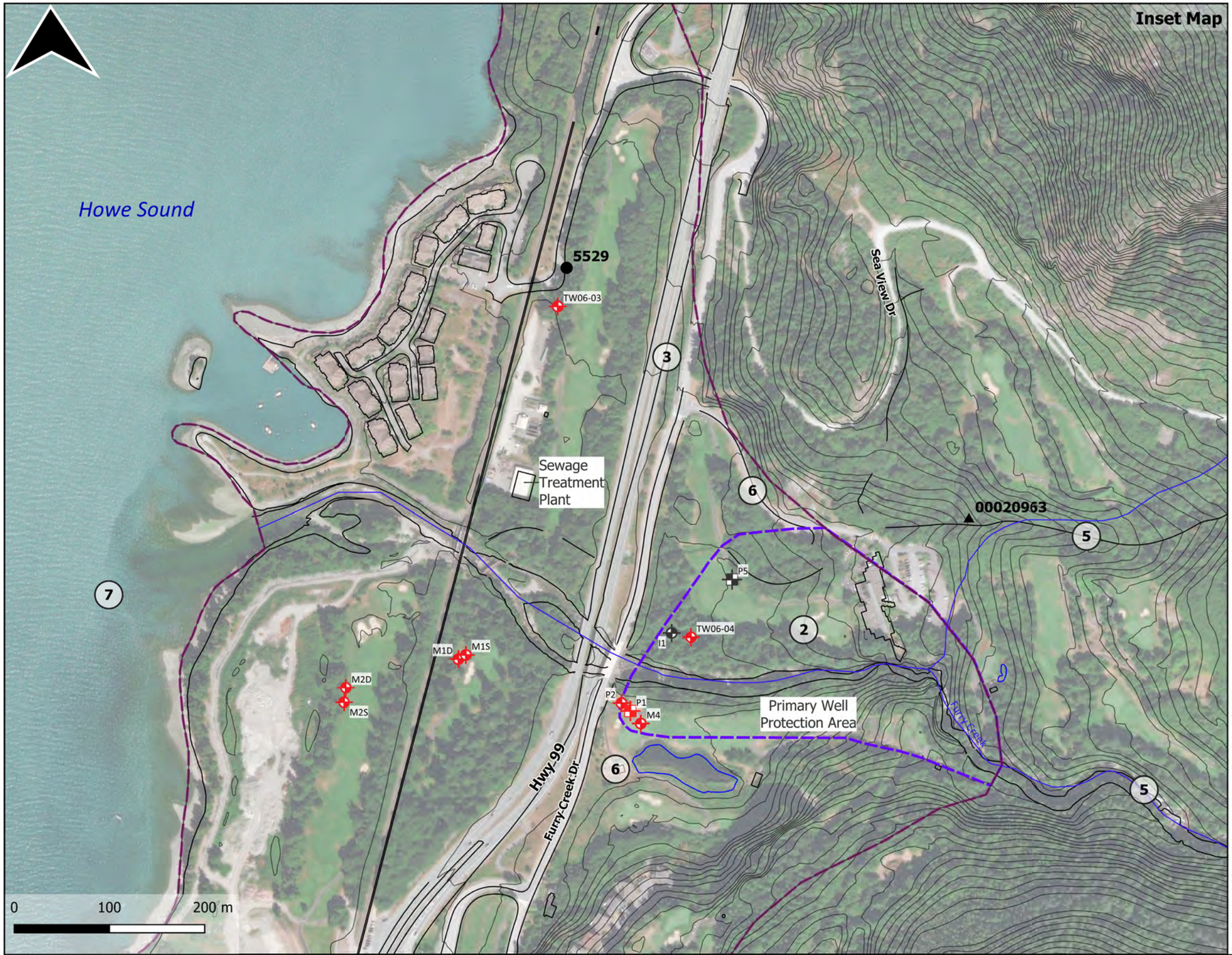
western water ASSOCIATES LTD

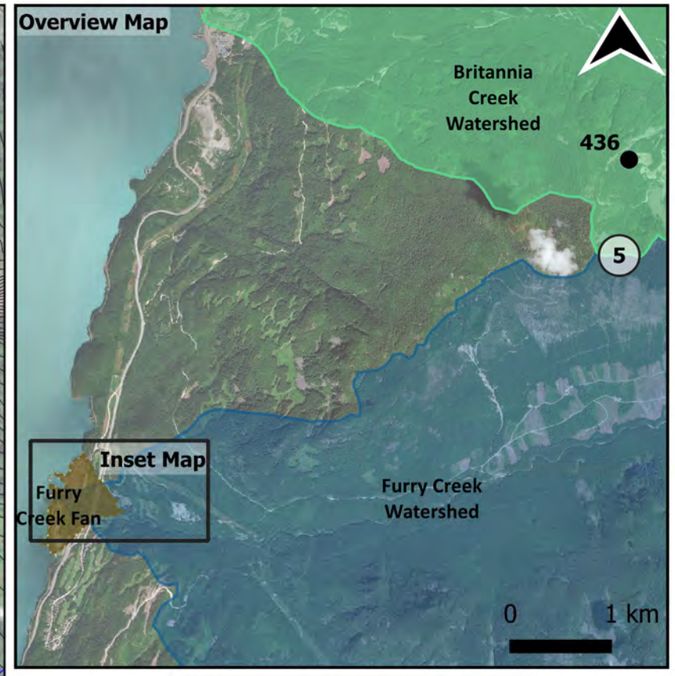
TITLE **Figure 4.2:** Analytical Capture Zones and Source Protection Area

DRAWN	DATE	CLIENT
Morgan Jackson, GIT	August 25, 2022	Fine Peace Furry Creek Development Ltd. C/O CREUS Engineering Ltd.
REVIEWED	PROJECT NO.	REVISION NO.
Tim Sivak, P. Geo.	22-107-01VC	D

Data Sources: Base plan from publicly available data sources

Contour interval: 5 m
Map Projection: NAD83 UTM Zone 10N
Other notes: TOT is time of travel





1 Potential contaminant source(s)
Active supply well
Inactive supply well
Active monitoring well
Inactive well
Federal contaminated sites
B.C. registered site

Hazard Number	Description
1 (not shown)	Furry Creek Rezoning
2	Fertilizers used on Furry Creek Golf Course
3	Transportation corridors and potential releases
4 (not shown)	Contaminants introduced into existing used or unused wells, or well casings acting as preferential contaminantion pathways
5	Metal contamination from creeks assoicated with legacy mining impacts
6	Nearby sanitary infrastructure
7	Climate change / Sea water intrusion

Furry Creek Source Water Protection Plan

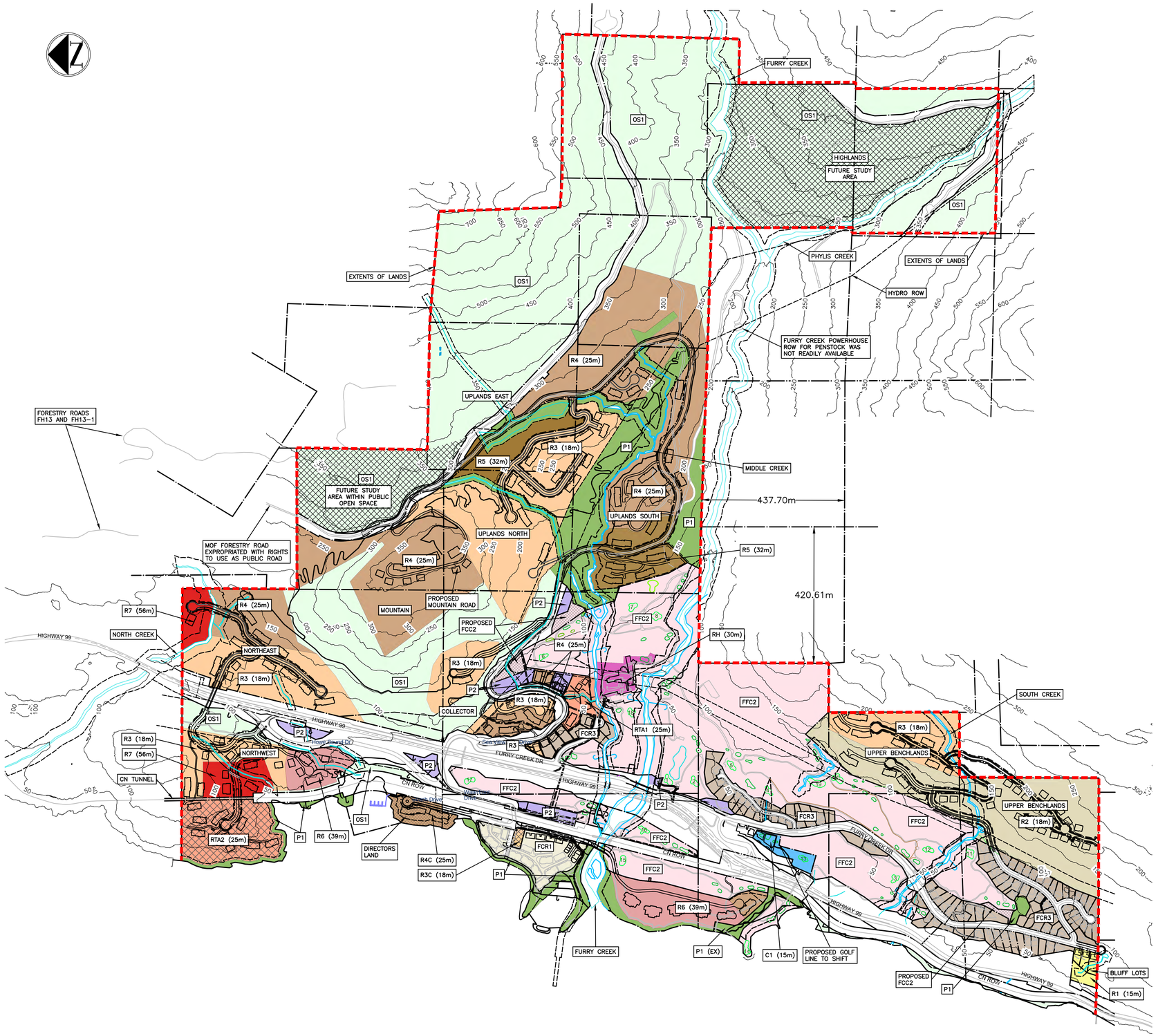
western water ASSOCIATES LTD

TITLE **Figure 5.1:** Contaminant Source Inventory

DRAWN	DATE	CLIENT
Morgan Jackson, GIT	October 5, 2022	Fine Peace Furry Creek Development Ltd. C/O CREUS Engineering Ltd.
REVIEWED	PROJECT NO.	REVISION NO.
Tim Sivak, P. Geo.	22-107-01VC	B

Data Sources: Base plan from publicly available data sources

Contour interval: 5 m
Map Projection: NAD83 UTM Zone 10N
Other notes: -



LEGEND

acre	ha	% of total	EXISTING ZONING
			FCC1 – EX COMMERCIAL / RESIDENTIAL
144.3	58.4	13.9%	FCC2 – EX GOLF COURSE COMMERCIAL
7.3	2.9	0.7%	FCR1 – EX MARINA RESIDENTIAL
26.2	10.6	2.5%	FCR3 – EX RESIDENTIAL (SF/DUPLEX)
acre	**ha**	**% of total**	**PROPOSED ZONING**
2.4	1.0	0.2%	FCC2 – PROPOSED GOLF COURSE
47.1	19.1	4.5%	P1 – PARK
306.2	123.9	29.6%	OS1 – OPEN SPACE
7.3	3.0	0.7%	P2 – COMMUNITY ADMINISTRATION & UTILITY
2.6	1.1	0.3%	C1 – PROPOSED VILLAGE COMMERCIAL (VC) UP TO 3 STORIES (15m)
3.4	1.4	0.3%	RH – PROPOSED RESORT & HOTEL (RH) UP TO 6 STORIES (30m)
1.5	0.6	0.1%	R1 – RESIDENTIAL – SINGLE FAMILY (SF), DUPLEX (15m)
40.0	16.2	3.9%	R2 – RESIDENTIAL – TOWNHOUSES (TH), STACKED TOWNHOUSES (18m)
89.5	36.2	8.6%	R3 – LOW RISE RESIDENTIAL – APARTMENTS UP TO 4 STORIES (18m)
0.4	0.2	0.0%	R3C – LOW RISE RESIDENTIAL – APARTMENTS UP TO 4 STORIES w/ COMMERCIAL ON MAIN FLOOR (18m)
3.3	1.6	0.3%	RTA1 – RESIDENTIAL / HOSPITALITY – APARTMENTS & HOSPITALITY UP TO 4 STORIES (18m)
13.8	5.6	1.3%	RTA2 – RESIDENTIAL / HOSPITALITY – APARTMENTS & HOSPITALITY UP TO 6 STORIES (25m)
97.3	39.4	9.4%	R4 – MID RISE RESIDENTIAL – APARTMENTS UP TO 6 STORIES (25m)
3.5	1.4	0.3%	R4C – MID RISE RESIDENTIAL – APARTMENTS UP TO 6 STORIES (25m) w/ COMMERCIAL
16.9	6.8	1.6%	R5 – MID RISE RESIDENTIAL – APARTMENTS UP TO 8 STORIES (32m)
15.5	6.3	1.5%	R6 – MID RISE RESIDENTIAL – APARTMENTS UP TO 10 STORIES (39m)
9.1	3.7	0.9%	R7 – HIGH RISE RESIDENTIAL – APARTMENTS UP TO 15 STORIES (56m)
83.5	33.8	8.0%	OS1 – FUTURE STUDY AREA WITHIN PUBLIC OPEN SPACE

TOTAL PROJECT AREA: 1036acres / 419ha

NOT FOR CONSTRUCTION

CREUS Engineering
Civil Engineers & Project Managers
#610 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3
PH: 604-987-9070 WEBSITE: www.creus.ca

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASEMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (STD/SI)			
CAP			
MANHOLE			
POWER POLE			
STREETLIGHT			

approved

client: FINE PEACE HOLDINGS

project: FURRY CREEK BC

title: CONCEPTUAL LAND USE PLAN

no.	(y/m/d)	revision	chk'd
14	20-11-26	REVISED RESIDENTIAL ZONING	AGC
13	20-11-13	ISSUED FOR COORDINATION	DJE
12	20-10-28	ISSUED TO NSDA FOR COORDINATION	DJE
11	20-10-20	LEGEND & AREAS UPDATED	DJE
10	20-09-09	UPDATED ZONING AT COLLECTOR	DJE
9	19/06/07	ADJUSTED ZONING AREAS	TJV
8	19/01/21	UPDATED WITH HEIGHT ZONES	MHS
7	19/01/11	UPDATED ZONING PLAN	TJV

current rev. # 14

engineer of record: KBH	scales: hor:1:6000 vert:1:6000
designed by: KBH	file no.: 14305
drawn by: TJV	drawing no.: KEY-200
date: 2018-08-30	

Appendix A

Well Logs/Well Completion Reports

WWAL Ref: 22-107-01VC

1072 P1

GROUNDWATER PRODUCTION WELL NO. 1

FURRY CREEK LANDS

BRITISH COLUMBIA, CANADA

SURFACE ELEVATION - 13 M (42.65 FT.)

Depth Metres	Feet	Lithology
0 - 4.3	0 - 14	Clay, pebbly
4.3 - 5.8	14 - 19	Silt, with pebbles and cobbles, hard, brown
5.8 - 7.3	19 - 24	Gravel, sand, compact, till-like
7.3 - 15.8	24 - 52	Sand and gravel, fine to coarse water-bearing - static water level 3.7 m or 12 ft.
15.8 - 22.6	52 - 74	Clay, silty, brown
22.6 - 28.0	74 - 92	Sand and gravel, water-bearing static water level 11.6 m or 38 ft.
28.0 - 29.9	92 - 98 Total Depth	Sand and gravel, tight, clay binder

Casing Record

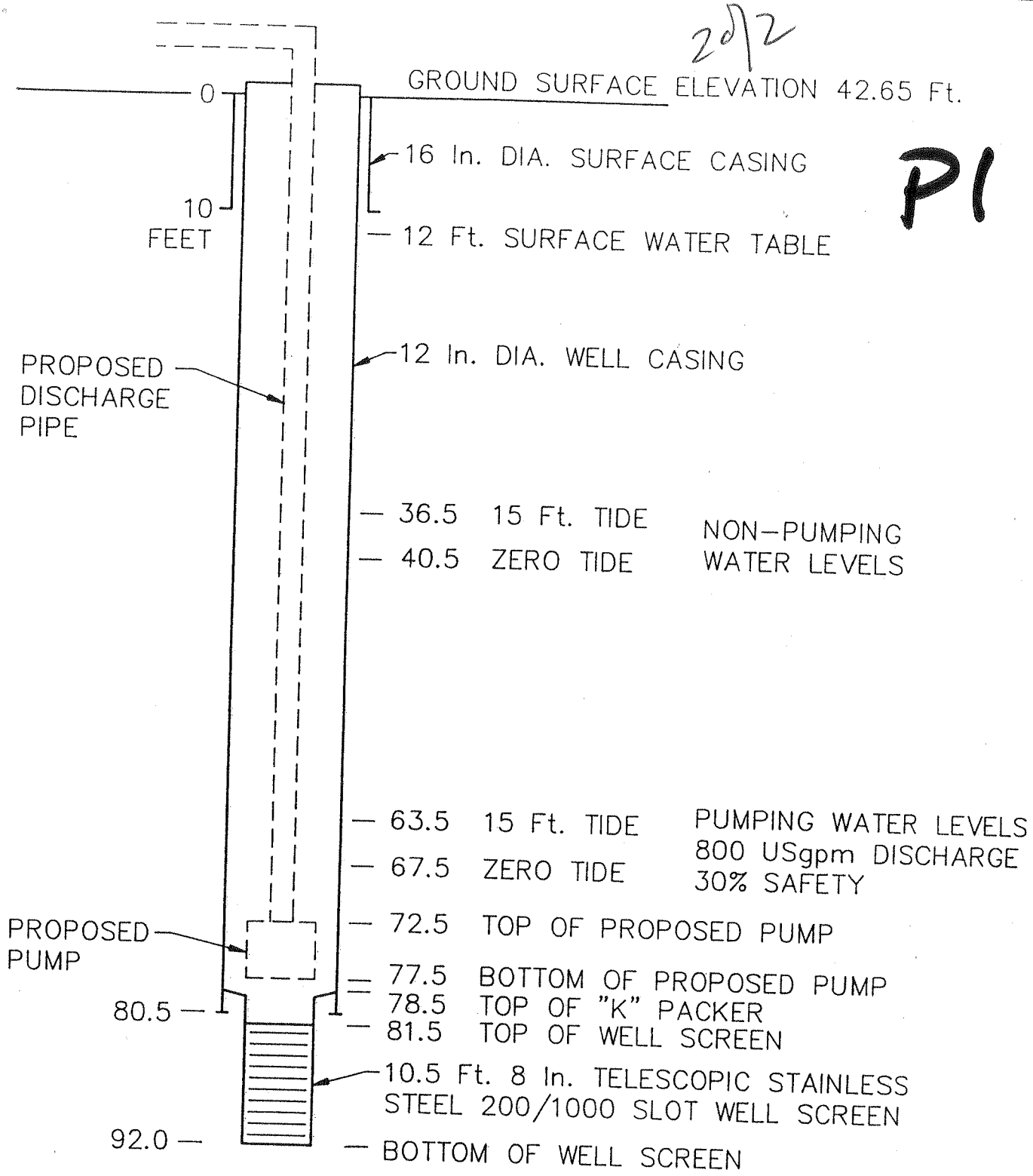
- 16-inch (40 cm) 0 to 3.0 m 0 to 10.0 ft.
- 12-inch (30 cm) 0.6 to 24.5 m +1.9 to -80.5 ft.

Screen - Stainless steel, 8-inch (20.3 cm) telescopic diameter, slot openings 200/1000 inch (0.5 cm) with type K packer and 7-inch (18 cm) riser

Setting
- Top Packer - 23.9 m - 78.5 ft.
- Top Screen - 24.8 m - 81.5 ft.
- Bottom Screen - 28.0 m - 92.0 ft.

Development - surging, bailing, pumping

2 of 2



P1

TANAC DEVELOPMENT CANADA CORP.	BROWN, ERDMAN & ASSOCIATES LTD. INTERNATIONAL GROUNDWATER CONSULTANTS 382 MATHERS AVENUE, WEST VANCOUVER, B.C. V7S 1H3			
WELL LOG TEST – PRODUCTION WELL No. 1	BY W.L.B	DATE 22-07-91	JOB NO. 91-459	FIGURE 2

192

IRRIGATION WELL #1 (ID1)

GROUNDWATER PRODUCTION WELL NO. 2

FURRY CREEK LANDS

BRITISH COLUMBIA, CANADA

Surface Elevation - 12 M or 39.37 Feet

Depth Metres	Depth Metres	Lithology
0 - 6.1	0 - 20	Boulders up to 2 metres (6.5 feet) across, cobbles, pebbles, sand. Water-bearing static water level - 2.74 m (9 ft.)
6.1 - 8.5	20 - 28	Till-like cemented sand and gravel: 0.9 m (3 ft.) boulder blasted.
8.5 - 11.3	28 - 37	Clay, pebbly, gritty
11.3 - 19.8	37 - 65	Till, with pebbly silty sand interbeds
19.8 - 20.4	65 - 67	Clay, pebbly
20.4 - 29.3	67 - 96	Sand and gravel, compact, tight non-productive
29.3 - 43.6	96 - 143	Sand and gravel. Productive and non-productive zones interbedded as follows:

Metres	Feet	
29.3-29.6	96- 97	Productive
29.6-30.2	97- 99	Non-Productive
30.2-31.4	99-103	Productive
31.4-32.3	103-106	Non-Productive
32.3-32.9	106-108	Productive
32.9-33.5	108-110	Non-Productive
33.5-35.1	110-115	Productive
35.1-36.0	115-118	Non-Productive
36.0-37.8	118-124	Productive
37.8-38.1	124-125	Non-Productive
38.1-39.0	125-128	Productive
39.0-40.2	128-132	Non-Productive
40.2-43.6	132-143	Productive

Depth Metres	Depth Metres	Lithology
43.6 - 44.2	143 - 145	Boulder
44.2 - 49.4	145 - 162	Sand, med.-c.g., gravel, pebbles, cobbles, water-bearing, productive
49.4 - 50.0 T.D.	162 - 164 T.D.	Sand, gravel, clay: inter-bedded, open hole, non-productive

Casing Record

- 16-inch (40 cm) 0 to 5.8 m 0 to 19 feet
- 12-inch (30 cm) +0.6 to 44.8 m +2 to 147 feet

Screen

- Stainless steel 15.5 feet (4.7 m) long, 8-inch (20.3 cm) telescopic diameter, slot openings 80/1000 inch (0.2 cm) with type K packer and 7-inch (18 cm) diameter riser totalling 6 feet (1.8 metres) in length

Setting

- Top of Packer - 43.3 m 142 feet
- Top of Screen - 45.1 m 148 feet
- Bottom of Screen - 49.8 m 163.5 feet

Development

- Surging, bailing, pumping

BOREHOLE NO. WELL NO. P2

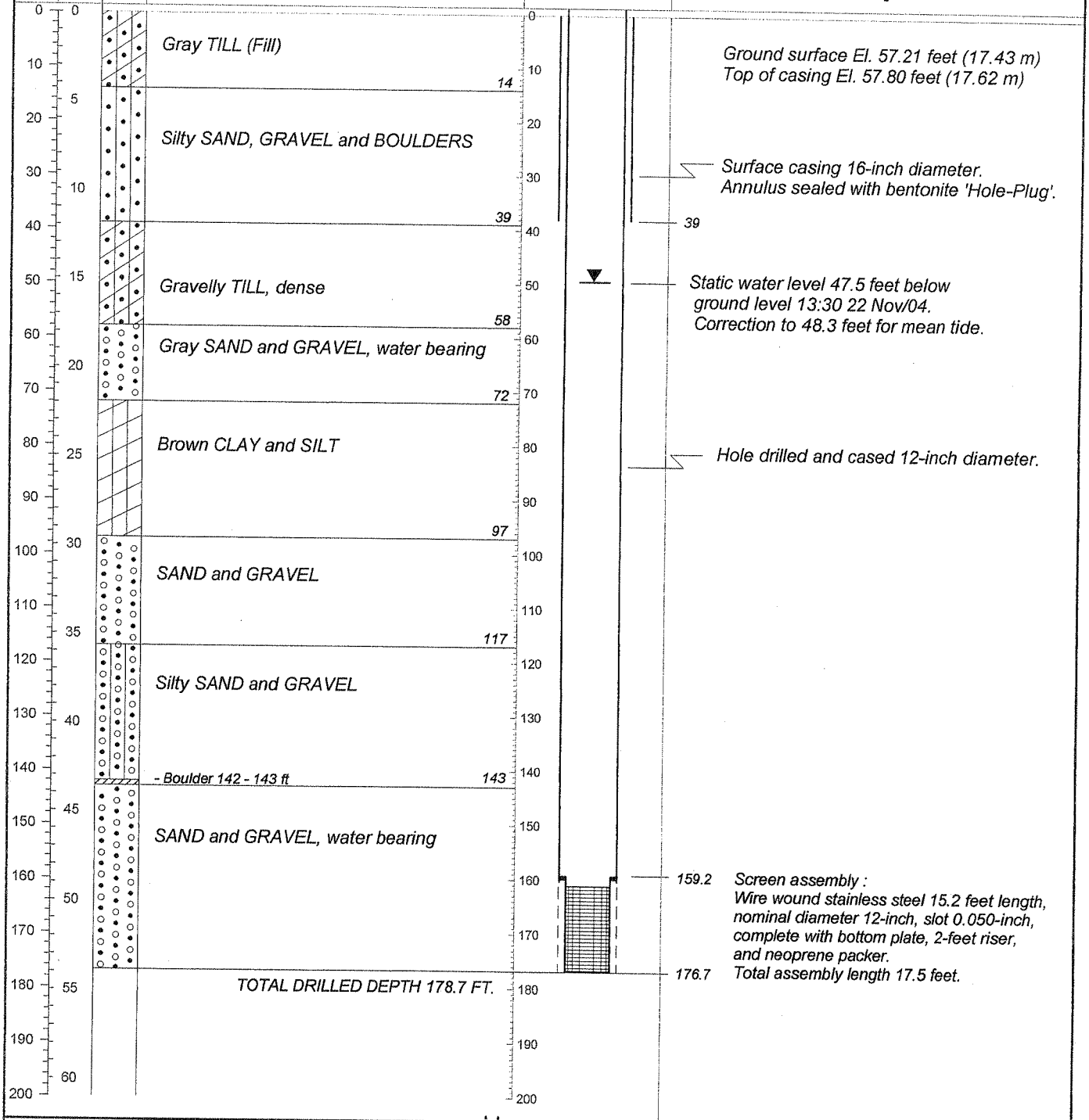
LOCATION FURRY CREEK LANDS
FURRY CREEK B.C.

DRILLER FIELD DRILLING CONTRACTORS LTD.

EQUIPMENT BARBER AIR ROTARY DRILL RIG

DATE COMPLETED 18 NOVEMBER 2004

P2



CLIENT
FURRY CREEK LANDS

h reed consulting ltd
hydrogeology services
LANGLEY
BRITISH COLUMBIA

PROJECT
GROUNDWATER DEVELOPMENT

LOG OF WELL
WELL NO. P2

BY	DATE
HWR	14 DEC 04
PROJ. NO. 04.045	DRAWING NO. 301

GROUNDWATER MONITORING WELL
M1 - DEEP

M1-D

FURRY CREEK LANDS
BRITISH COLUMBIA, CANADA

SURFACE ELEVATION - 5.35 M (17.55 FT)
LOCATION - ADJACENT TO 16TH FAIRWAY AND GREEN

Depth Metres	Depth Feet	Lithology
0 - 2.1	0 - 7	Boulders, cobbles, pebbles, brown
2.1 - 25.0	7 - 82	Sand and gravel, brown, water-bearing.
25.0 - 43.9	82 - 144	Sand and gravel, blue, volcanics, water-bearing
43.9 - 44.2	144 - 145	Sand and gravel, very tight and compact, blue, volcanics
44.2 - 46.3	145 - 152	Gravel, coarse, minor sand, blue, volcanics, water-bearing
46.3 - 49.1	152 - 161	Sand and gravel, with silt and clay beds, blue, volcanics
49.1 - 85.3	161 - 280	Sand and gravel, blue, volcanics, water-bearing
85.3 - 88.7	280 - 291	Sand, medium to coarse grained, volcanics, blue, water-bearing.
88.7 - 90.8	291 - 298	Sand, medium to coarse grained, minor clay, grades to interbedded fine sand and clay minor water-bearing
90.5	298	Total depth

Casing Record - 8-inch (20 cm) 0 - 12.9 m 0 - 40 ft.
- 6-inch (15 cm) +0.6 - 82.6 m +2 - 271 ft.

Screen - Plastic, 4-1/2-inch (11.4 cm) diameter, 20/1000 inch (0.05 cm) slot openings with 4-1/2-inch (11.4 cm) plastic riser and flat bottom

Screen Setting Top Riser - 76.5 m 251 ft. El. Ground elev 5.35m
Top Screen - 82.6 m 271 ft. - 77.25m
Bottom Screen - 88.7 m 291 ft. - 83.35m

Development Surging and bailing

M1-S

GROUNDWATER MONITORING WELL
M1 - SHALLOW

FURRY CREEK LANDS
BRITISH COLUMBIA, CANADA

SURFACE ELEVATION - 5.42 M (17.78 FT)
LOCATION - ADJACENT TO 16TH FAIRWAY AND GREEN

Depth Metres	Depth Feet	Lithology
0 - 3.4	0 - 11	Sand and gravel, cobbles, brown, dry
3.4 - 9.4	11 - 31	Sand and gravel, water-bearing.
9.4	31	Total Depth

Casing Record - 6-inch (15 cm) steel 0 - 1.1 m 0 - 3.7 ft.

Screen - Plastic, 4-1/2-inch (11.4 cm) diameter, 20/1000 inch (0.05 cm) slot openings with 4-1/2-inch (11.4 cm) plastic riser and flat bottom

GR. EL. ELEV = 5.42

Screen Setting			
Top Riser	- 0.6 m	2 ft.	
Top Screen	- 7.9 m	26 ft.	-2.48
Bottom Screen	- 9.4 m	31 ft.	-3.98

Development Bailing

M2-D

GROUNDWATER MONITORING WELL
M2 - DEEP

FURRY CREEK LANDS
BRITISH COLUMBIA, CANADA

SURFACE ELEVATION - 3.99 M (13.09 FT)
LOCATION - ADJACENT TO WEST SIDE 15TH FAIRWAY

Depth Metres	Depth Feet	Lithology
0 - 3.4	0 - 11	Sand and gravel, brown, dry
3.4 - 35.1	11 - 115	Sand and gravel, blue, water-bearing
35.1 - 46.6	115 - 153	Gravel, pebbles to 4 cm (1.5 in.) black volcanics, water-bearing
46.6 - 50.0	153 - 164	Sand and gravel, silty, black volcanics, water-bearing
50.0 - 63.1	164 - 207	Sand and gravel, clean, black volcanics, water-bearing
63.1 - 70.1	207 - 230	Gravel, coarse, clean, water-bearing
70.1 - 83.5	230 - 274	Sand and gravel, clean, black volcanics, water-bearing
83.5 - 91.4	274 - 300	Sand, medium to coarse, some gravel and silt, water-bearing, **brackish water at 85.3 m (280 ft.) and salt water at 91.4 m (300 ft.)**
91.4	300	Total depth

Casing Record - 8-inch (20 cm) 0 - 12.2 m 0 - 40 ft.
6-inch (15 cm) +0.3 - 69.8 m +1 - 229 ft.

Screen - Plastic, 4-1/2-inch (11.4 cm) diameter
20/1000 inch (0.05 cm) slot openings
with 4-1/2-inch (11.4 cm) plastic riser
and flat bottom

M2-D
Surface elev. = 3.99 m
CSL

Screen Setting - Top Riser 64 m 210 ft. - 66.11 m
- Top Screen 70.1 m 230 ft. - 72.21 m
- Bottom Screen 76.2 m 250 ft.

M2-D

M2 - DEEP

Screen Assembly and
Salt Water Well Seal

	Metres	Feet	
- Riser	64 - 70.1	210 - 230	
- Screen	70.1 - 76.2	230 - 250	
- Fill	76.2 - 79.2	250 - 260	
- Plug	79.2 - 80.8	260 - 265	(Bentonite & Cement)
- Fill	80.8 - 83.8	265 - 275	
- Plug	83.8 - 86.9	275 - 285	(Bentonite & Cement)
- Fill	86.9 - 91.4	285 - 300	

Development - Surging and Bailing

M2-S

GROUNDWATER MONITORING WELL
M2 - SHALLOW

FURRY CREEK LANDS
BRITISH COLUMBIA, CANADA

SURFACE ELEVATION - 3.56 M (11.68 FT)
LOCATION - ADJACENT TO WEST SIDE 15TH FAIRWAY

Depth Metres	Depth Feet	Lithology
0 - 2.1	0 - 7	Sand and gravel, cobbles, dry
2.1 - 9.1	7 - 30	Sand and gravel, water-bearing.
9.1	30	Total depth

Casing Record - 6-inch (15 cm) steel 0 - 2.1 m 0 - 7.0 ft.

Screen - Plastic, 4-1/2-inch (11.4 cm) diameter
20/1000 inch (0.05 cm) slot openings
with 4-1/2-inch (11.4 cm) plastic riser
and flat bottom

Sample Elev. 3.56m

Screen Setting - Top Riser - 0.3 m 1 ft.
- Top Screen - 7.6 m 25 ft. -4.04m
- Bottom Screen - 8.8 m 29 ft. -5.24m

Development - Bailing

GROUNDWATER MONITORING WELL
M3

M3

FURRY CREEK LANDS
BRITISH COLUMBIA, CANADA

SURFACE ELEVATION - 24.24 M (79.53 FT)
LOCATION - 154 M (505 FT) EAST OF PRODUCTION WELL NO. 1

Depth Metres	Depth Feet	Lithology
0 - 4.6	0 - 15	Sand and gravel, brown, dry
4.6 - 10.7	15 - 35	Sand and gravel, blue, water-bearing
10.7 - 20.4	35 - 67	Bedrock, granite

Casing Record - 6-inch (15 cm) 0 - 2.1 m 0 - 7 ft.

Screen - Plastic, 4-1/2-inch (11.4 cm) diameter
20/1000 inch (0.05 cm) slot openings
with 4-1/2-inch (11.4 cm) plastic riser
and flat bottom

Screen Setting	- Top Riser	- 0.01 m	0.3 ft.
	- Top Screen	- 6.1 m	20.0 ft.
	- Bottom Screen	- 12.2 m	40.0 ft.

GROUNDWATER MONITORING WELL
M4

M4

FURRY CREEK LANDS
BRITISH COLUMBIA, CANADA

SURFACE ELEVATION - 17.94 M (58.86 FT)
LOCATION - ADJACENT TO PRODUCTION WELL NO. 1

Depth Metres	Depth Feet	Lithology
0 - 3.1	0 - 10	Fill with boulders
3.1 - 19.2	10 - 63	Pebbly clay, cobbles, boulders, gravel, seepage
19.2 - 19.8	63 - 65	Boulder
19.8 - 27.4	65 - 90	Sub-stratified drift, cobbles, pebbles, clay and gravel with water-bearing thin beds, grey
27.4 - 30.2	90 - 99	Gravel and boulders, till-like, grey
30.2 - 32.0	90 - 105	Sand and gravel, grey, water-bearing
32.0 - 36.0	105 - 118	Sand and gravel, tight, clay binder
36.0 - 51.2	118 - 168	Gravel, water-bearing, grey
51.2 - 52.4	168 - 172	Bedrock
52.4	172	Total depth

Casing Record - 8-inch (20 cm) 0 - 13.7 m 0 - 45 ft.
- 6-inch (15 cm) 0 - 45.7 m 0 - 150 ft.

Screen - Plastic, 4-1/2-inch (11.4 cm) diameter, 20/1000 inch (0.05 cm) slot openings with 4-1/2-inch (11.4 cm) plastic riser and flat bottom

Screen Setting
Top Riser - 40.2 m 132 ft.
Top Screen - 46.3 m 152 ft.
Bottom Screen - 52.4 m 172 ft.

Development Bailing

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GEOTECHNICAL AND HYDROGEOLOGICAL CONSULTANTS
VANCOUVER LIMA

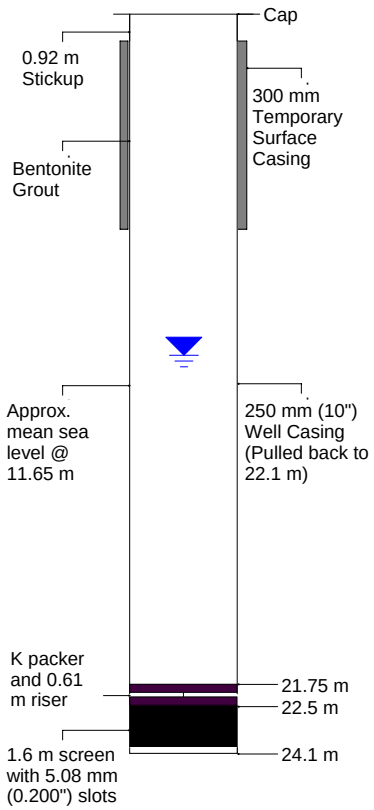
Well Number: TW06-3

Project: Groundwater Supply Assessment
Location: Furry Creek, BC
Project Number: 2801
Logged By: A&H Drilling
Borehole Diameter: 250 mm

Client: Tanac Development Canada Corp.
Coordinates: E 483925.79 N 5492532.08
Ground Elevation: 11.70 m-geodetic

Depth Below Ground Surface (ft / m)	Depth (mBGS)	Lithologic Description	Lithology	Remarks
-3 / 2 / 7	0.0	Ground Surface		
		BOULDERS & SAND & GRAVEL.		
12	3.7			
17 / 5		Gravelly TILL with boulders. (Aquitard)		
22 / 27 / 32 / 10 / 37 / 42 / 47 / 15	15.8			Initial static water level = 10.6 m below top of casing (2.0 m geodetic)
52 / 57 / 62 / 20 / 67 / 72 / 77	23.8	Water bearing, coarse SAND.		Mid-point of screen = - 11.6 m geodetic
		GRAVEL with trace silt		
82 / 25 / 87 / 92 / 97 / 30 / 102 / 107 / 112 / 35 / 117 / 122		End of Hole		

Constructed Well



Drilling Contractor: A&H Well Drilling
Drilling Method: Dual Air Rotary
Drilling Started: August 8, 2006
Drilling Ended: August 9, 2006

PITEAU ASSOCIATES
GEOTECHNICAL AND HYDROGEOLOGICAL CONSULTANTS
VANCOUVER LIMA

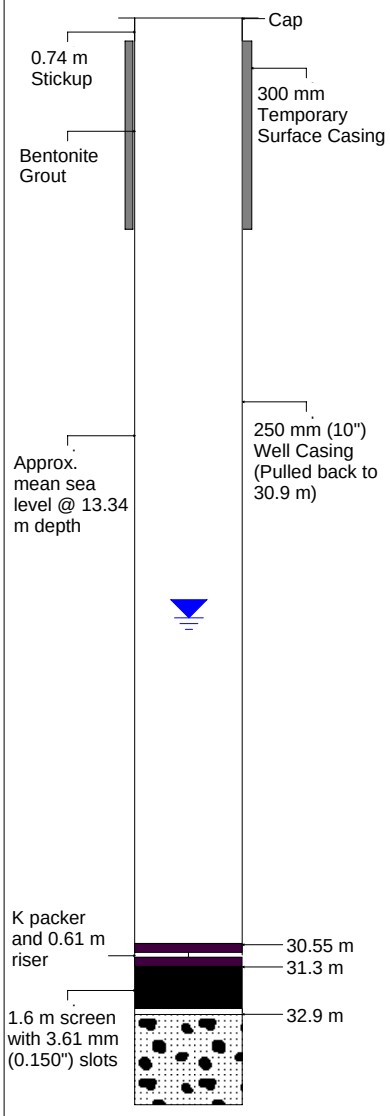
Well Number: TW06-4

Project: Groundwater Supply Assessment
Location: Furry Creek, BC
Project Number: 2801
Logged By: CDH
Borehole Diameter: 250 mm

Client: Tanac Development Canada Corp.
Coordinates: E 484065.94 N 5492184.66
Ground Elevation: 13.39 m-geodetic

Depth Below Ground Surface (ft / m)	Depth (mBGS)	Lithologic Description	Lithology	Remarks
-3 ft / m	0.0	Ground Surface		
2 ft		Open GRAVEL with fine sand/silty binder.		
7 ft				
12 ft				
17 ft / 5 m				
22 ft				
27 ft				
32 ft / 10 m	9.8	Dense, glacial TILL. (Aquitard)		
37 ft				
42 ft				
47 ft / 15 m				
52 ft				
57 ft				
62 ft / 20 m	19.2	Water bearing, Silty SAND & GRAVEL, with cobbles and boulders.		Initial static water level = 19.5 m below top of casing (- 5.02 m geodetic)
67 ft				
72 ft				
77 ft				EC = 40 uS @ 24.4m (80')
82 ft / 25 m	26.2			
87 ft		Loose, wet GRAVEL, with some sandier interbeds and silty wash.		
92 ft				
97 ft		Boney, little pressure in formation water		EC = 44-47uS @ 29.3m (96')
102 ft / 30 m				Mid-point of screen = - 18.7 m geodetic
107 ft		Sandier, with more formation water		EC = 38uS @ 32.0m (105')
112 ft				EC = 44uS @ 33.8m (111')
117 ft / 35 m	35.4	Water bearing GRAVEL, with more sand.		
122 ft		End of Hole		EC = 131uS @ 36.6m (120')

Constructed Well



Drilling Contractor: A&H Well Drilling
Drilling Method: Dual Air Rotary
Drilling Started: August 14, 2006
Drilling Ended: August 15, 2006

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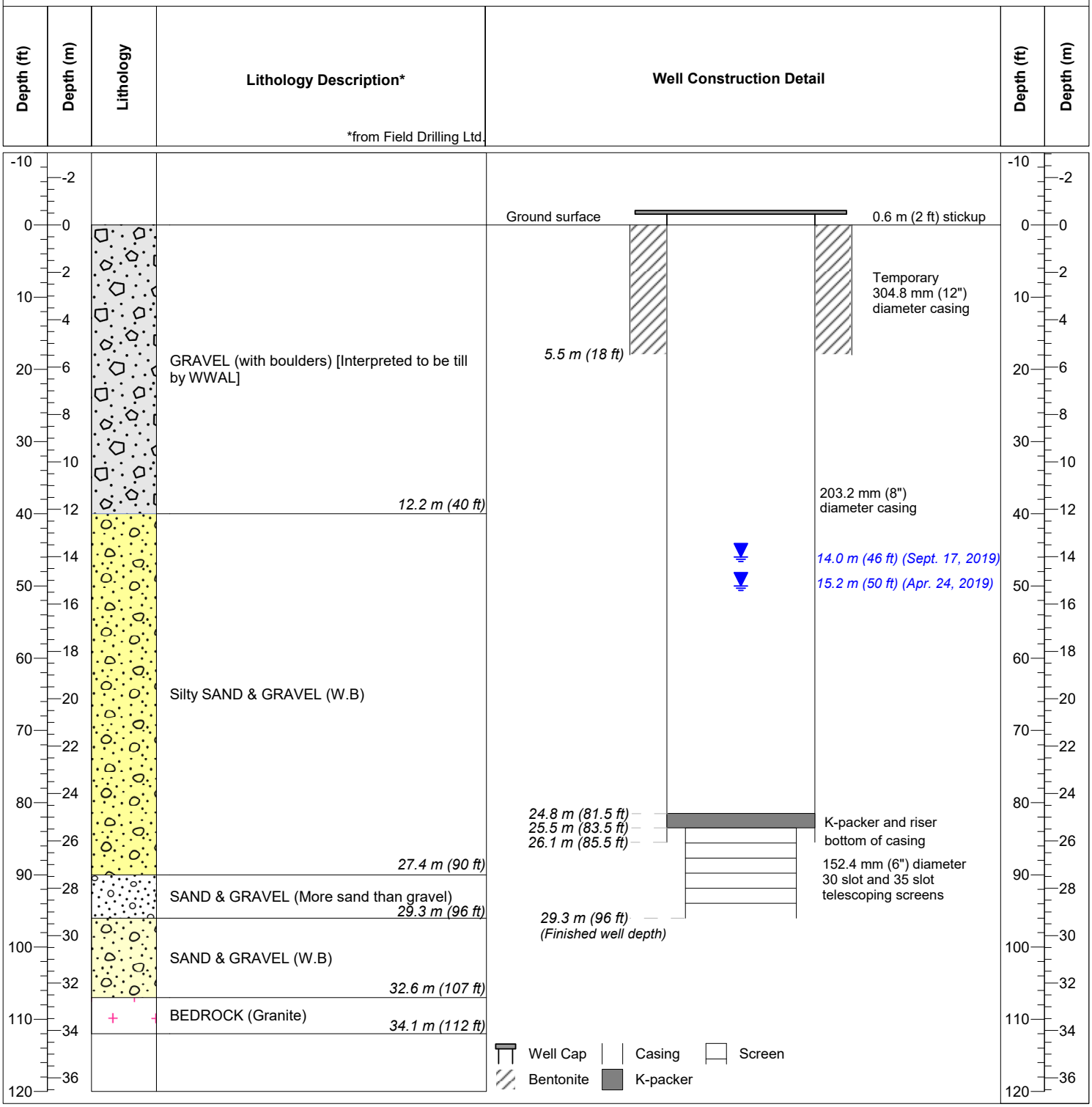

Figure 3.1. Well Construction Detail (WPID 51052)

Project:	Furry Creek Oliver Landing & South Lands Development	Project No.: 17-119-01	Drawn by: TJS
Location:	Furry Creek, BC	Date: 2019-12-03	Checked by:

Datum: UTM NAD83 Zone 10U Northing: 5492245.3 Easting: 484109.2 Elevation: - *Coordinates taken with GPS*	Date(s) Drilled: 2019-04-22 to 2019-04-24 Drilling Company: Field Drilling Ltd. Driller: Bill McIvor Drilling Method: Dual Air Rotary Drillers Estimated Yield: 120 USgpm	Casing Diameter: 203.2 mm (8") Casing Stickup: 0.6 m (2 ft) Well Tag Number (WTN): 117453 Well Plate Number (WPID): 51052 Development Method: -

Appendix B

List of Fertilizer Products Used on Furry Creek Golf Course

WWAL Ref: 22-107-01VC

Product	Type	Active Ingredient
Secure[1]	Fungicide	Fluazinam
Trilogy[2]	Fungicide	**Iprodione,** triticonazole**, trifloxystrobin**
Banner Maxx[3]	Fungicide	**Propiconazole,** tetrahydrofurfuryl alcohol (THFA)
Daconil[4]	Fungicide	Chlorothalonil, Acibenzolar-S-methyl, **Propylene glycol**
Exteris[5]	Fungicide	**Trifloxystrobin, fluopyram,** iso-tridecyl alcohol, ethoxylated, phosphate alcohols, C12-16, ethoxylated (>5-15 EO)
Primo Maxx[6]	Plant Growth Regulator	Tetrahydro-2-furyl-methanol, trinexapac-ethyl
Velista[7]	Fungicide	Penthiopyrad (ISO), kaolin
signature XTRA[8]	Fungicide	Fosetyl-Aluminium, sodium diisopropylnaphthalene sulphonate, formic acid
Revolution[9]	Soil surfactant/wetting agent	Modified ethylene oxide/propylene oxide block copolymer
Mirage[10]	Fungicide	**Tebuconazole**

Notes:

Bold indicates active ingredient is included in selected analysis package in April 2022 sampling event.

[1] https://www.greencastonline.com/products/secure-fungicide/turf

[2] https://www.environmentalscience.bayer.ca/-/media/prfcanada/product-sds/trilogystressgard_sds_march2021_en.ashx

[3] https://www.greencast.ca/products/banner-maxx

[4] https://www.greencastonline.com/products/daconil-action-fungicide/turf

[5] https://www.environmentalscience.bayer.ca/-/media/prfcanada/product-sds/exteris_stressgard_sds_aug2020__en.ashx

[6] https://assets.syngenta-us.com/pdf/msds/Primo_Maxx_26989_en_SDS.pdf

[7] https://assets.syngenta-us.com/pdf/msds/Velista_Fungicide_30334_en_SDS.pdf

[8] https://www.environmentalscience.bayer.ca/-/media/prfcanada/product-sds/signatureextrastressgard_2020_en.ashx

[9] https://aquatrols.com/wp-content/uploads/2021/08/Revolution-US-SDS-2021.pdf

[10] https://www.environmentalscience.bayer.ca/-/media/prfcanada/product-sds/mirage_stressgard_english_sds_21feb2017.ashx

Appendix C

Capture Zone Calculations

WWAL Ref: 22-107-01VC

Capture Zone Delineation Worksheet: Analytical Equations Method

Project Name: Furry Creek Source Water Protection Plan
WWAL Project Number: 22-107-01VC
Well Name: P1
Calculations by: NN
Checked by: TJS
Date: 12-Aug-22

AE Formulas: **Y = Q / (2000 * T * i)** **X = Y / π** **dTOT = (t * K * i) / n**

where:
Y = half width of the capture zone in metres
Q = average pumping rate in L/s
T = transmissivity (m2/s)
i = ambient hydraulic gradient

X = downgradient reach of capture zone

where:
dTOT = upgradient extent of capture zone for specified time in metres
k = hydraulic conductivity in m/y (transmissivity / aquifer thickness)
i = ambient hydraulic gradient
n = aquifer porosity
b = aquifer thickness in m

Data input cells

Q	7
T (m2/day)	855
T (m2/s)	0.0099
i	0.01
b	29
k (m/y)	10761.2069
d 1year	1
d 5 yr	5
d 10 yr	10
n	0.2

Results (metres)

Y	**35**
2Y	**71**
X	**11**
d 1 year	**538**
d 5 year	**2690**
d 10 year	**5381**

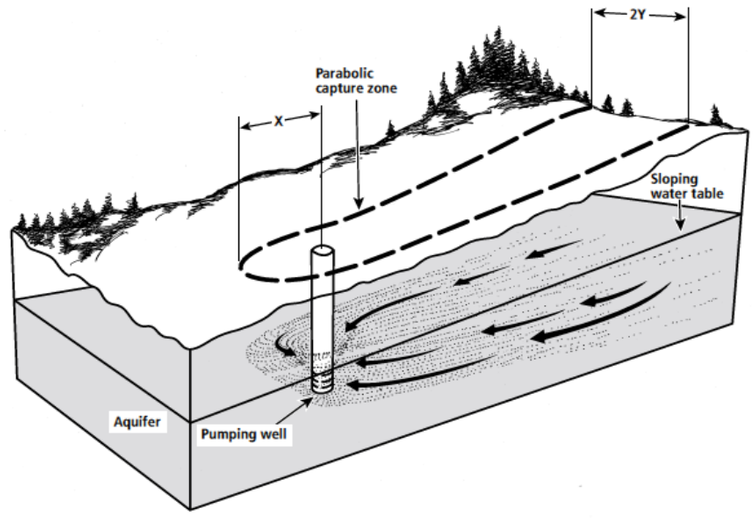

Image Source: BC Well Protection Toolkit. BC MOE 2000.

Assumptions
1) Hydraulic gradient estimated from manually measured water levels measured by WWAL in July 2020
2) Transmissivity (T) based on test pumping analyses from Piteau and Thurber (2007)
3) Saturated thickness (b) based aquifer depth reported in well log for P2 and the confining layer reported in well log for P1.
4) Pumping rate (Q) based on maximum allowable long term pumping rate to mitigate against seawater intrusion (WWAL, 2021a)
5) Porosity (n) from Piteau and Thurber (2007)

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Capture Zone Delineation Worksheet: Analytical Equations Method

Project Name: Furry Creek Source Water Protection Plan
WWAL Project Number: 22-107-01VC
Well Name: P5
Calculations by: NN
Checked by: TJS
Date: 12-Aug-22

AE Formulas: **Y = Q / (2000 * T * i)** **X = Y / π** **dTOT = (t * K * i) / n**

where:
Y = half width of the capture zone in metres
Q = average pumping rate in L/s
T = transmissivity (m2/s)
i = ambient hydraulic gradient

X = downgradient reach of capture zone

where:
dTOT = upgradient extent of capture zone for specified time in metres
k = hydraulic conductivity in m/y (transmissivity / aquifer thickness)
i = ambient hydraulic gradient
n = aquifer porosity
b = aquifer thickness in m

Data input cells

Q	3
T (m2/day)	129.6
T (m2/s)	0.0015
i	0.01
b	19.7
k (m/y)	2401.21827
d 1year	1
d 5 yr	5
d 10 yr	10
n	0.2

Results (metres)

Y	**100**
2Y	**200**
X	**32**
d 1 year	**120**
d 5 year	**600**
d 10 year	**1201**

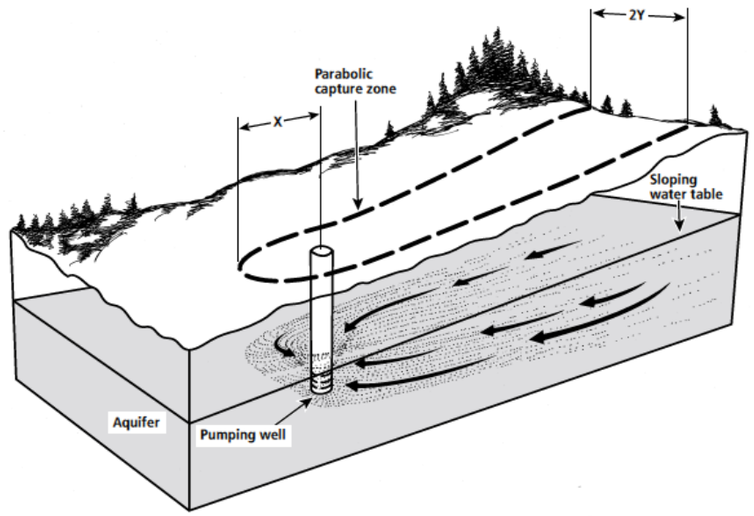

Image Source: BC Well Protection Toolkit. BC MOE 2000.

Assumptions
1) Hydraulic gradient estimated from manually measured water levels measured by WWAL in July 2020
2) Transmissivity (T) based on test pumping analyses from WWAL (2021a)
3) Saturated thickness (b) based on average water levels between June 25 2021 and April 27 2022 and depth to bedrock at P5
4) Pumping rate (Q) based on maximum allowable long term pumping rate to mitigate against seawater intrusion (WWAL, 2021a)
5) Porosity (n) from Piteau and Thurber (2007)

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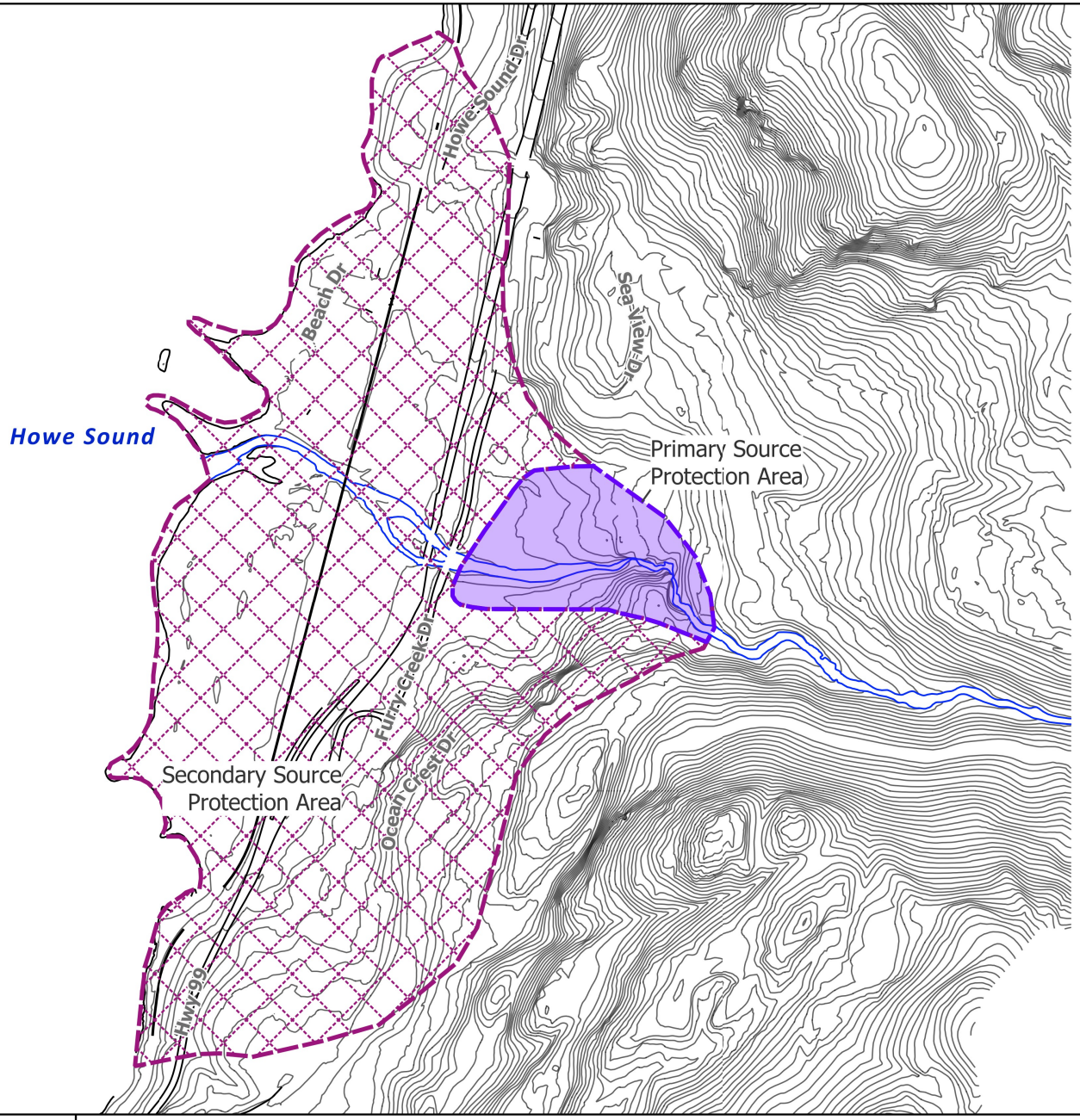
Appendix D

Official Community Plan (OCP) Mapping

WWAL Ref: 22-107-01VC



Contour interval: 5 m
Map Projection: NAD83 UTM Zone 10

Furry Creek Source Water Protection Plan

TITLE **Figure D1:** Primary and Secondary Source Protection Areas

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DRAWN	DATE	CLIENT
Tim Sivak, P.Geo.	December 8, 2022	Fine Peace Furry Creek Development Ltd. C/O CREUS Engineering Ltd.
REVIEWED	PROJECT NO.	REVISION NO.
	22-107-01VC	A

Appendix E

Laboratory Reports

WWAL Ref: 22-107-01VC

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **VA22A8587**	Page	: 1 of 4
Client	: **Keats Island Construction & Services Ltd.**	Laboratory	: Vancouver - Environmental
Contact	: Scott Benson	Account Manager	: Tasnia Tarannum
Address	: 299 Forin Road Gibsons BC Canada V0N 1V0	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: 604 989 4119	Telephone	: +1 604 253 4188
Project	: Furry Water	Date Samples Received	: 22-Apr-2022 12:55
PO	: ----	Date Analysis Commenced	: 25-Apr-2022
C-O-C number	: 20-997754	Issue Date	: 13-May-2022 14:42
Sampler	: SB		
Site	: ----		
Quote number	: ----		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Joshua Stessun	Laboratory Analyst	Organics, Calgary, Alberta
Kim Jensen	Department Manager - Metals	Inorganics, Burnaby, British Columbia
Nguyen Tran	Laboratory Analyst	Organics, Calgary, Alberta
Oscar Ruiz	Lab Assistant	Metals, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Shirley Li		Metals, Calgary, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	Well	Distribution	----	----	----
					Client sampling date / time	20-Apr-2022 15:00	20-Apr-2022 15:30	----	----	----
						VA22A8587-001	VA22A8587-002	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		14.8	19.3	----	----	----
colour, true	----	E329	5.0	CU		8.3	<5.0	----	----	----
conductivity	----	E100	2.0	µS/cm		49.9	72.1	----	----	----
pH	----	E108	0.10	pH units		7.36	7.45	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		34	55	----	----	----
turbidity	----	E121	0.10	NTU		<0.10	<0.10	----	----	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L		18.2	14.2	----	----	----
Anions and Nutrients										
chloride	16887-00-6	E235.Cl	0.50	mg/L		1.32	4.84	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.022	0.023	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.593	0.623	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		4.23	4.38	----	----	----
Total Metals										
aluminum, total	7429-90-5	E420	0.0100	mg/L		<0.0100	<0.0100	----	----	----
antimony, total	7440-36-0	E420	0.00050	mg/L		<0.00050	<0.00050	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L		<0.00010	<0.00010	----	----	----
barium, total	7440-39-3	E420	0.0200	mg/L		<0.0200	<0.0200	----	----	----
boron, total	7440-42-8	E420	0.100	mg/L		<0.100	<0.100	----	----	----
cadmium, total	7440-43-9	E420	0.000200	mg/L		<0.000200	<0.000200	----	----	----
calcium, total	7440-70-2	E420	0.100	mg/L		5.82	4.40	----	----	----
chromium, total	7440-47-3	E420	0.00200	mg/L		<0.00200	<0.00200	----	----	----
copper, total	7440-50-8	E420	0.00100	mg/L		0.123	0.00658	----	----	----
iron, total	7439-89-6	E420	0.030	mg/L		<0.030	<0.030	----	----	----
lead, total	7439-92-1	E420	0.000500	mg/L		<0.000500	<0.000500	----	----	----
magnesium, total	7439-95-4	E420	0.100	mg/L		0.888	0.775	----	----	----
manganese, total	7439-96-5	E420	0.00200	mg/L		<0.00200	<0.00200	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L		<0.0000050	<0.0000050	----	----	----
potassium, total	7440-09-7	E420	0.100	mg/L		0.678	0.499	----	----	----
selenium, total	7782-49-2	E420	0.00100	mg/L		<0.00100	<0.00100	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Well	Distribution	----	----	----
					Client sampling date / time	20-Apr-2022 15:00	20-Apr-2022 15:30	----	----	----
Analyte	CAS Number	Method	LOR	Unit		VA22A8587-001	VA22A8587-002	--------	--------	--------
						Result	Result	----	----	----
Total Metals										
sodium, total	7440-23-5	E420	2.00	mg/L		6.45	3.00	----	----	----
uranium, total	7440-61-1	E420	0.000100	mg/L		<0.000100	<0.000100	----	----	----
zinc, total	7440-66-6	E420	0.0500	mg/L		<0.0500	<0.0500	----	----	----
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L		<0.50	----	----	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L		<0.50	----	----	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L		<0.50	----	----	----	----
styrene	100-42-5	E611A	0.50	µg/L		<0.50	----	----	----	----
toluene	108-88-3	E611A	0.50	µg/L		<0.50	----	----	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L		<0.40	----	----	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L		<0.30	----	----	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L		<0.50	----	----	----	----
BTEX, total	----	E611A	1.0	µg/L		<1.0	----	----	----	----
Volatile Organic Compounds [THMs]										
bromodichloromethane	75-27-4	E611B	1.0	µg/L		----	<1.0	----	----	----
bromoform	75-25-2	E611B	1.0	µg/L		----	<1.0	----	----	----
chloroform	67-66-3	E611B	1.0	µg/L		----	<1.0	----	----	----
dibromochloromethane	124-48-1	E611B	1.0	µg/L		----	<1.0	----	----	----
trihalomethanes [THMs], total	----	E611B	2.0	µg/L		----	<2.0	----	----	----
Volatile Organic Compounds [THMs] Surrogates										
bromofluorobenzene, 4-	460-00-4	E611B	1.0	%		----	76.4	----	----	----
difluorobenzene, 1,4-	540-36-3	E611B	1.0	%		----	113	----	----	----
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%		98.6	----	----	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%		96.2	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22A8587**	Page	: 1 of 10
Client	: **Keats Island Construction & Services Ltd.**	Laboratory	: Vancouver - Environmental
Contact	: Scott Benson	Account Manager	: Tasnia Tarannum
Address	: 299 Forin Road Gibsons BC Canada V0N 1V0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 989 4119	Telephone	: +1 604 253 4188
Project	: Furry Water	Date Samples Received	: 22-Apr-2022 12:55
PO	: ----	Issue Date	: 13-May-2022 14:42
C-O-C number	: 20-997754		
Sampler	: SB		
Site	: ----		
Quote number	: ----		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Distribution	E235.Cl	20-Apr-2022	----	----	----		25-Apr-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Well	E235.Cl	20-Apr-2022	----	----	----		25-Apr-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
Distribution	E235.F	20-Apr-2022	----	----	----		25-Apr-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
Well	E235.F	20-Apr-2022	----	----	----		25-Apr-2022	28 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Distribution	E235.NO3-L	20-Apr-2022	----	----	----		25-Apr-2022	3 days	5 days	× EHT
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Well	E235.NO3-L	20-Apr-2022	----	----	----		25-Apr-2022	3 days	5 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Distribution	E235.NO2-L	20-Apr-2022	----	----	----		25-Apr-2022	3 days	5 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Well	E235.NO2-L	20-Apr-2022	----	----	----		25-Apr-2022	3 days	5 days	× EHT
Anions and Nutrients : Sulfate in Water by IC										
HDPE Distribution	E235.SO4	20-Apr-2022	----	----	----		25-Apr-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Well	E235.SO4	20-Apr-2022	----	----	----		25-Apr-2022	28 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Distribution	E290	20-Apr-2022	----	----	----		27-Apr-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Well	E290	20-Apr-2022	----	----	----		27-Apr-2022	14 days	7 days	✓
Physical Tests : Colour (True) by Spectrometer										
HDPE Distribution	E329	20-Apr-2022	----	----	----		25-Apr-2022	3 days	5 days	× EHT
Physical Tests : Colour (True) by Spectrometer										
HDPE Well	E329	20-Apr-2022	----	----	----		25-Apr-2022	3 days	5 days	× EHT
Physical Tests : Conductivity in Water										
HDPE Distribution	E100	20-Apr-2022	----	----	----		27-Apr-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE Well	E100	20-Apr-2022	----	----	----		27-Apr-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE Distribution	E108	20-Apr-2022	----	----	----		27-Apr-2022	0.25 hrs	158 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Well	E108	20-Apr-2022	----	----	----		27-Apr-2022	0.25 hrs	159 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE Distribution	E162	20-Apr-2022	----	----	----		27-Apr-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Well	E162	20-Apr-2022	----	----	----		27-Apr-2022	7 days	6 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE Distribution	E121	20-Apr-2022	----	----	----		26-Apr-2022	3 days	6 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE Well	E121	20-Apr-2022	----	----	----		26-Apr-2022	3 days	6 days	× EHT
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Distribution	E508	20-Apr-2022	----	----	----		28-Apr-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Well	E508	20-Apr-2022	----	----	----		28-Apr-2022	28 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Distribution	E420	20-Apr-2022	----	----	----		12-May-2022	180 days	22 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Well	E420	20-Apr-2022	----	----	----		12-May-2022	180 days	22 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
Well	E611A	20-Apr-2022	28-Apr-2022	----	----		28-Apr-2022	14 days	8 days	✓
Volatile Organic Compounds [THMs] : THMs by Headspace GC-MS										
Glass vial (sodium thiosulfate)										
Distribution	E611B	20-Apr-2022	28-Apr-2022	----	----		28-Apr-2022	14 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	467448	1	12	8.3	5.0	✓
BTEX by Headspace GC-MS	E611A	471655	1	11	9.0	5.0	✓
Chloride in Water by IC	E235.Cl	467450	1	20	5.0	5.0	✓
Colour (True) by Spectrometer	E329	467459	1	17	5.8	5.0	✓
Conductivity in Water	E100	467447	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	467453	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	467451	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	467452	1	20	5.0	5.0	✓
pH by Meter	E108	467446	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	467449	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	469133	1	17	5.8	5.0	✓
THMs by Headspace GC-MS	E611B	471544	1	8	12.5	5.0	✓
Total Mercury in Water by CVAAS	E508	471355	1	5	20.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	477975	1	17	5.8	5.0	✓
Turbidity by Nephelometry	E121	468463	1	17	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	467448	1	12	8.3	5.0	✓
BTEX by Headspace GC-MS	E611A	471655	1	11	9.0	5.0	✓
Chloride in Water by IC	E235.Cl	467450	1	20	5.0	5.0	✓
Colour (True) by Spectrometer	E329	467459	1	17	5.8	5.0	✓
Conductivity in Water	E100	467447	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	467453	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	467451	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	467452	1	20	5.0	5.0	✓
pH by Meter	E108	467446	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	467449	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	469133	1	17	5.8	5.0	✓
THMs by Headspace GC-MS	E611B	471544	1	8	12.5	5.0	✓
Total Mercury in Water by CVAAS	E508	471355	1	5	20.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	477975	1	17	5.8	5.0	✓
Turbidity by Nephelometry	E121	468463	1	17	5.8	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	467448	1	12	8.3	5.0	✓
BTEX by Headspace GC-MS	E611A	471655	1	11	9.0	5.0	✓
Chloride in Water by IC	E235.Cl	467450	1	20	5.0	5.0	✓
Colour (True) by Spectrometer	E329	467459	1	17	5.8	5.0	✓
Conductivity in Water	E100	467447	1	19	5.2	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Fluoride in Water by IC	E235.F	467453	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	467451	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	467452	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	467449	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	469133	1	17	5.8	5.0	✓
THMs by Headspace GC-MS	E611B	471544	1	8	12.5	5.0	✓
Total Mercury in Water by CVAAS	E508	471355	1	5	20.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	477975	1	17	5.8	5.0	✓
Turbidity by Nephelometry	E121	468463	1	17	5.8	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	471655	1	11	9.0	5.0	✓
Chloride in Water by IC	E235.Cl	467450	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	467453	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	467451	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	467452	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	467449	1	20	5.0	5.0	✓
THMs by Headspace GC-MS	E611B	471544	1	8	12.5	5.0	✓
Total Mercury in Water by CVAAS	E508	471355	1	5	20.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	477975	1	17	5.8	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer	E329 Vancouver - Environmental	Water	APHA 2120 C (mod)	Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Metals in Water by CRC ICPMS	E420 Calgary - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Calgary - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
BTEX by Headspace GC-MS	E611A Calgary - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
THMs by Headspace GC-MS	E611B Calgary - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Hardness (Calculated) from Total Ca/Mg	EC100A Calgary - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis	EP581 Calgary - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.

QUALITY CONTROL REPORT

Work Order	: **VA22A8587**	Page	: 1 of 10
Client	: Keats Island Construction & Services Ltd.	Laboratory	: Vancouver - Environmental
Contact	: Scott Benson	Account Manager	: Tasnia Tarannum
Address	: 299 Forin Road Gibsons BC Canada V0N 1V0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 989 4119	Telephone	: +1 604 253 4188
Project	: Furry Water	Date Samples Received	: 22-Apr-2022 12:55
PO	: ----	Date Analysis Commenced	: 25-Apr-2022
C-O-C number	: 20-997754	Issue Date	: 13-May-2022 14:42
Sampler	: SB		
Site	: ----		
Quote number	: ----		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
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General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 467446)											
VA22A8584-001	Anonymous	pH	----	E108	0.10	pH units	8.32	8.33	0.120%	4%	----
Physical Tests (QC Lot: 467447)											
VA22A8584-001	Anonymous	conductivity	----	E100	2.0	µS/cm	1490	1490	0.0673%	10%	----
Physical Tests (QC Lot: 467448)											
VA22A8584-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	144	144	0.0694%	20%	----
Physical Tests (QC Lot: 467459)											
KS2201338-001	Anonymous	colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 468463)											
FJ2200960-001	Anonymous	turbidity	----	E121	0.10	NTU	2.00	2.29	13.5%	15%	----
Physical Tests (QC Lot: 469133)											
VA22A8452-005	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	476	454	4.73%	20%	----
Anions and Nutrients (QC Lot: 467449)											
VA22A8584-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	551	546	1.03%	20%	----
Anions and Nutrients (QC Lot: 467450)											
VA22A8584-001	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	71.8	70.9	1.20%	20%	----
Anions and Nutrients (QC Lot: 467451)											
VA22A8584-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.163	0.142	0.0211	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 467452)											
VA22A8584-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 467453)											
VA22A8584-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.660	0.662	0.001	Diff <2x LOR	----
Total Metals (QC Lot: 471355)											
VA22A8569-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 477975)											
VA22A8459-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	0.0035	0.0005	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00029	0.00029	0.000004	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00028	0.00027	0.000010	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0648	0.0660	1.75%	20%	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.018	0.018	0.00010	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000284	0.0000328	0.0000044	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	169	169	0.0861%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 477975) - continued											
VA22A8459-001	Anonymous	chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00055	0.00073	0.00018	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	0.000050	0.00000001	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.100	mg/L	39.4	40.0	1.33%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00043	0.00044	0.00001	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.100	mg/L	3.12	3.11	0.297%	20%	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	92.0	94.2	2.37%	20%	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000345	0.000327	5.25%	20%	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 471655)											
RG2200361-001	Anonymous	benzene	71-43-2	E611A	0.00050	µg/L	0.00165 mg/L	1.74	0.10	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.00050	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.00050	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.00050	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.00050	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
Volatile Organic Compounds [THMs] (QC Lot: 471544)											
CG2204859-001	Anonymous	bromodichloromethane	75-27-4	E611B	1.0	µg/L	2.1	2.1	0.06	Diff <2x LOR	----
		bromoform	75-25-2	E611B	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		chloroform	67-66-3	E611B	1.0	µg/L	7.8	7.7	1.10%	30%	----
		dibromochloromethane	124-48-1	E611B	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 467447)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 467448)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 467459)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 468463)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 469133)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 467449)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 467450)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 467451)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 467452)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 467453)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Total Metals (QCLot: 471355)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.000000005	----
Total Metals (QCLot: 477975)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 477975) - continued						
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Volatile Organic Compounds (QCLot: 471655)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds [THMs] (QCLot: 471544)						
bromodichloromethane	75-27-4	E611B	1	µg/L	<1.0	----
bromoform	75-25-2	E611B	1	µg/L	<1.0	----
chloroform	67-66-3	E611B	1	µg/L	<1.0	----
dibromochloromethane	124-48-1	E611B	1	µg/L	<1.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 467446)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 467447)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 467448)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Physical Tests (QCLot: 467459)									
colour, true	----	E329	5	CU	100 CU	99.4	85.0	115	----
Physical Tests (QCLot: 468463)									
turbidity	----	E121	0.1	NTU	200 NTU	96.5	85.0	115	----
Physical Tests (QCLot: 469133)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	98.8	85.0	115	----
Anions and Nutrients (QCLot: 467449)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 467450)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 467451)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 467452)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 467453)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Total Metals (QCLot: 471355)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	100	80.0	120	----
Total Metals (QCLot: 477975)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	103	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	108	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	98.5	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	91.9	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	99.8	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	92.0	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	96.6	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 477975) - continued									
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	98.4	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	94.6	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	92.7	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	97.0	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.3	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	97.4	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	96.1	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	90.2	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	96.3	80.0	120	----
Volatile Organic Compounds (QCLot: 471655)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	105	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	97.9	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	108	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	102	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	101	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	98.6	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	105	70.0	130	----
Volatile Organic Compounds [THMs] (QCLot: 471544)									
bromodichloromethane	75-27-4	E611B	1	µg/L	100 µg/L	107	70.0	130	----
bromoform	75-25-2	E611B	1	µg/L	100 µg/L	98.6	70.0	130	----
chloroform	67-66-3	E611B	1	µg/L	100 µg/L	114	70.0	130	----
dibromochloromethane	124-48-1	E611B	1	µg/L	100 µg/L	84.6	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 467449)										
VA22A8584-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	512 mg/L	500 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 467450)										
VA22A8584-002	Anonymous	chloride	16887-00-6	E235.Cl	508 mg/L	500 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 467451)										
VA22A8584-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	12.8 mg/L	12.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 467452)										
VA22A8584-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	2.55 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 467453)										
VA22A8584-002	Anonymous	fluoride	16984-48-8	E235.F	5.12 mg/L	5 mg/L	102	75.0	125	----
Total Metals (QCLot: 471355)										
VA22A8586-001	Anonymous	mercury, total	7439-97-6	E508	0.0000936 mg/L	0.0001 mg/L	93.6	70.0	130	----
Total Metals (QCLot: 477975)										
VA22A8459-002	Anonymous	aluminum, total	7429-90-5	E420	1.83 mg/L	2 mg/L	91.4	70.0	130	----
		antimony, total	7440-36-0	E420	0.200 mg/L	0.2 mg/L	99.8	70.0	130	----
		arsenic, total	7440-38-2	E420	0.179 mg/L	0.2 mg/L	89.6	70.0	130	----
		barium, total	7440-39-3	E420	0.186 mg/L	0.2 mg/L	93.3	70.0	130	----
		boron, total	7440-42-8	E420	0.895 mg/L	1 mg/L	89.5	70.0	130	----
		cadmium, total	7440-43-9	E420	0.0374 mg/L	0.04 mg/L	93.5	70.0	130	----
		calcium, total	7440-70-2	E420	34.8 mg/L	40 mg/L	86.9	70.0	130	----
		chromium, total	7440-47-3	E420	0.358 mg/L	0.4 mg/L	89.4	70.0	130	----
		copper, total	7440-50-8	E420	0.187 mg/L	0.2 mg/L	93.7	70.0	130	----
		iron, total	7439-89-6	E420	18.1 mg/L	20 mg/L	90.5	70.0	130	----
		lead, total	7439-92-1	E420	0.190 mg/L	0.2 mg/L	94.8	70.0	130	----
		magnesium, total	7439-95-4	E420	8.66 mg/L	10 mg/L	86.6	70.0	130	----
		manganese, total	7439-96-5	E420	0.181 mg/L	0.2 mg/L	90.7	70.0	130	----
		potassium, total	7440-09-7	E420	34.9 mg/L	40 mg/L	87.3	70.0	130	----
		selenium, total	7782-49-2	E420	0.360 mg/L	0.4 mg/L	90.0	70.0	130	----
		sodium, total	7440-23-5	E420	18.8 mg/L	20 mg/L	93.8	70.0	130	----
		uranium, total	7440-61-1	E420	0.0374 mg/L	0.04 mg/L	93.5	70.0	130	----
		zinc, total	7440-66-6	E420	3.54 mg/L	4 mg/L	88.4	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 471655)										
RG2200361-001	Anonymous	benzene	71-43-2	E611A	107 µg/L	100 µg/L	107	70.0	130	----
		ethylbenzene	100-41-4	E611A	102 µg/L	100 µg/L	102	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	109 µg/L	100 µg/L	109	70.0	130	----
		styrene	100-42-5	E611A	97.8 µg/L	100 µg/L	97.8	70.0	130	----
		toluene	108-88-3	E611A	100 µg/L	100 µg/L	100	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	206 µg/L	200 µg/L	103	70.0	130	----
		xylene, o-	95-47-6	E611A	103 µg/L	100 µg/L	103	70.0	130	----
Volatile Organic Compounds [THMs] (QCLot: 471544)										
CG2204859-001	Anonymous	bromodichloromethane	75-27-4	E611B	99.4 µg/L	100 µg/L	99.4	70.0	130	----
		bromoform	75-25-2	E611B	96.2 µg/L	100 µg/L	96.2	70.0	130	----
		chloroform	67-66-3	E611B	97.9 µg/L	100 µg/L	97.9	70.0	130	----
		dibromochloromethane	124-48-1	E611B	87.0 µg/L	100 µg/L	87.0	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 997754

Page 1 of 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division
Vancouver
Work Order Reference
VA22A8587

Telephone : +1 604 253 4188

Report To	Contact and company name below will appear on the final report
Company:	KEATS ISLD CONSTR
Contact:	SCOTT BENSON
Phone:	604-740-7561
	Company address below will appear on the final report
Street:	
City/Province:	
Postal Code:	
Invoice To	Same as Report To ☒ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☒ PDF ☒ EXCEL ☒ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax SCOTT@KICAS.CA
Email 2 BENJAMIN@KICAS.CA
Email 3 EWITWICKI@SLRD.CA

Invoice Recipients

Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax KIM@KICAS.CA
Email 2 ADMIN@KICAS.CA

Turnaround Time (TAT) Requested

☒ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minim
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minim
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minim
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minim
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Al may apply to rush requests on weekends, statutory holidays and non

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, pleas

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#:
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:	FURRY WATER	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact:	Sampler: SB.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	DRINKING WATER ANL	THM	BTX	SAMPLES ON HOLD	EXTENDED STORAGE REQ	SUSPECTED HAZARD (see n
	WELL	20 APR 22	1500	WATER	5	✓		✓			
	DISTRIBUTION	20 APR 22	1530	WATER	4	✓	✓				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO
Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

ANNUAL DRINKING WATER (NO BACT)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☒ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
					18		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: S. BENSON	Date: 22 APR 22	Time: 12:55	Received by:	Date:	Time:	Received by: JC	Date: 22 Apr 22	Time: 1255 pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS 2019 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

CERTIFICATE OF ANALYSIS

REPORTED TO	Western Water Associates Ltd 106 - 5145 26th Street Vernon, BC V1T 8G4		
ATTENTION	Tim Sivak	**WORK ORDER**	22D3722
PO NUMBER	21452	**RECEIVED / TEMP**	2022-04-29 13:30 / 4.5°C
PROJECT	21452	**REPORTED**	2022-05-11 16:32
PROJECT INFO		**COC NUMBER**	B107311

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
TW06-04 (22D3722-01) | Matrix: Water | Sampled: 2022-04-27					F2
****** DEFAULT GENERAL METHOD ******					
Abamectin	< 0.01	0.01	µg/g	2022-05-11	
Acephate	< 0.01	0.01	µg/g	2022-05-11	
Acetamiprid	< 0.01	0.01	µg/g	2022-05-11	
Acequinocyl	< 0.01	0.01	µg/g	2022-05-11	
Aldicarb	< 0.01	0.01	µg/g	2022-05-11	
Allethrin	< 0.01	0.01	µg/g	2022-05-11	
Azadirachtin	< 0.01	0.01	µg/g	2022-05-11	
Azoxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Benzovindiflupyr	< 0.01	0.01	µg/g	2022-05-11	
Bifenazate	< 0.01	0.01	µg/g	2022-05-11	
Bifenthrin	< 0.01	0.01	µg/g	2022-05-11	
Boscalid	< 0.01	0.01	µg/g	2022-05-11	
Buprofezin	< 0.01	0.01	µg/g	2022-05-11	
Carbaryl	< 0.01	0.01	µg/g	2022-05-11	
Carbofuran	< 0.01	0.01	µg/g	2022-05-11	
Chlorantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Chlorfenapyr	< 0.01	0.01	µg/g	2022-05-11	
Chlorpyrifos	< 0.01	0.01	µg/g	2022-05-11	
Clofentezine	< 0.01	0.01	µg/g	2022-05-11	
Clothianidin	< 0.01	0.01	µg/g	2022-05-11	
Coumaphos	< 0.01	0.01	µg/g	2022-05-11	
Cyantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Cyfluthrin (I, II, III, IV)	< 0.01	0.01	µg/g	2022-05-11	
Cypermethrin	< 0.02	0.02	µg/g	2022-05-11	
Cyprodinil	< 0.01	0.01	µg/g	2022-05-11	
Daminozide	< 0.02	0.02	µg/g	2022-05-11	
Deltamethrin	< 0.02	0.02	µg/g	2022-05-11	
Diazinon	< 0.01	0.01	µg/g	2022-05-11	
Dichlorvos	< 0.01	0.01	µg/g	2022-05-11	
Dimethoate	< 0.01	0.01	µg/g	2022-05-11	
Dimethomorph	< 0.01	0.01	µg/g	2022-05-11	
Dinotefuran	< 0.01	0.01	µg/g	2022-05-11	
Dodemorph	< 0.01	0.01	µg/g	2022-05-11	
Ethoprop	< 0.01	0.01	µg/g	2022-05-11	
Etofenprox	< 0.01	0.01	µg/g	2022-05-11	
Etoxazole	< 0.01	0.01	µg/g	2022-05-11	
Fenoxycarb	< 0.01	0.01	µg/g	2022-05-11	
Fenpyroximate	< 0.01	0.01	µg/g	2022-05-11	
Fensulfothion	< 0.01	0.01	µg/g	2022-05-11	
Fenthion	< 0.01	0.01	µg/g	2022-05-11	
Flonicamid	< 0.01	0.01	µg/g	2022-05-11	
Fluopyram	< 0.01	0.01	µg/g	2022-05-11	
Hexythiazox	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
TW06-04 (22D3722-01) | Matrix: Water | Sampled: 2022-04-27, Continued					F2
****** DEFAULT GENERAL METHOD ***, Continued***					
Imazalil	< 0.01	0.01	µg/g	2022-05-11	
Imidacloprid	< 0.01	0.01	µg/g	2022-05-11	
Iprodione	< 0.02	0.02	µg/g	2022-05-11	
Kinoprene	< 0.01	0.01	µg/g	2022-05-11	
Kresoxim-methyl	< 0.01	0.01	µg/g	2022-05-11	
Malathion	< 0.01	0.01	µg/g	2022-05-11	
Metalaxyl	< 0.01	0.01	µg/g	2022-05-11	
Methiocarb	< 0.01	0.01	µg/g	2022-05-11	
Methomyl	< 0.01	0.01	µg/g	2022-05-11	
Methoprene	< 0.01	0.01	µg/g	2022-05-11	
Methyl parathion	< 0.02	0.02	µg/g	2022-05-11	
Mevinphos	< 0.01	0.01	µg/g	2022-05-11	
MGK-264	< 0.01	0.01	µg/g	2022-05-11	
Myclobutanil	< 0.01	0.01	µg/g	2022-05-11	
Naled	< 0.01	0.01	µg/g	2022-05-11	
Novaluron	< 0.01	0.01	µg/g	2022-05-11	
Oxamyl	< 0.01	0.01	µg/g	2022-05-11	
Paclobutrazol	< 0.01	0.01	µg/g	2022-05-11	
Permethrin	< 0.02	0.02	µg/g	2022-05-11	
Phenothrin	< 0.01	0.01	µg/g	2022-05-11	
Phosmet	< 0.01	0.01	µg/g	2022-05-11	
Piperonyl butoxide	< 0.01	0.01	µg/g	2022-05-11	
Pirimicarb	< 0.01	0.01	µg/g	2022-05-11	
Prallethrin	< 0.01	0.01	µg/g	2022-05-11	
Propiconazole	< 0.01	0.01	µg/g	2022-05-11	
Propoxur	< 0.01	0.01	µg/g	2022-05-11	
Pyraclostrobin	< 0.01	0.01	µg/g	2022-05-11	
Pyrethrin	< 0.01	0.01	µg/g	2022-05-11	
Pyridaben	< 0.01	0.01	µg/g	2022-05-11	
Resmethrin	< 0.01	0.01	µg/g	2022-05-11	
Spinetoram	< 0.01	0.01	µg/g	2022-05-11	
Spinosad	< 0.01	0.01	µg/g	2022-05-11	
Spirodiclofen	< 0.01	0.01	µg/g	2022-05-11	
Spiromesifen	< 0.01	0.01	µg/g	2022-05-11	
Spirotetramat	< 0.01	0.01	µg/g	2022-05-11	
Spiroxamine	< 0.02	0.02	µg/g	2022-05-11	
Tebuconazole	< 0.01	0.01	µg/g	2022-05-11	
Tebufenozide	< 0.01	0.01	µg/g	2022-05-11	
Teflubenzuron	< 0.01	0.01	µg/g	2022-05-11	
Tetrachlorvinphos	< 0.01	0.01	µg/g	2022-05-11	
Tetramethrin	< 0.01	0.01	µg/g	2022-05-11	
Thiacloprid	< 0.01	0.01	µg/g	2022-05-11	
Thiamethoxam	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
TW06-04 (22D3722-01) | Matrix: Water | Sampled: 2022-04-27, Continued					F2
****** DEFAULT GENERAL METHOD ***, Continued***					
Thiophanate methyl	< 0.01	0.01	µg/g	2022-05-11	
Trifloxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Anions					
Chloride	**2.61**	0.10	mg/L	2022-04-30	
Fluoride	< 0.10	0.10	mg/L	2022-04-30	
Nitrate (as N)	**0.736**	0.010	mg/L	2022-04-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2022-04-30	
Sulfate	**3.5**	1.0	mg/L	2022-04-30	
Calculated Parameters					
Hardness, Total (as CaCO3)	**17.3**	0.500	mg/L	N/A	
Solids, Total Dissolved	**20.1**	1.00	mg/L	N/A	
Dissolved Metals					
Aluminum, dissolved	**0.0085**	0.0050	mg/L	2022-05-01	
Antimony, dissolved	< 0.00020	0.00020	mg/L	2022-05-01	
Arsenic, dissolved	< 0.00050	0.00050	mg/L	2022-05-01	
Barium, dissolved	**0.0167**	0.0050	mg/L	2022-05-01	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2022-05-01	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2022-05-01	
Boron, dissolved	< 0.0500	0.0500	mg/L	2022-05-01	
Cadmium, dissolved	**0.000018**	0.000010	mg/L	2022-05-01	
Calcium, dissolved	**5.33**	0.20	mg/L	2022-05-01	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2022-05-01	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2022-05-01	
Copper, dissolved	< 0.00040	0.00040	mg/L	2022-05-01	
Iron, dissolved	**0.202**	0.010	mg/L	2022-05-01	
Lead, dissolved	< 0.00020	0.00020	mg/L	2022-05-01	
Lithium, dissolved	**0.00024**	0.00010	mg/L	2022-05-01	
Magnesium, dissolved	**0.971**	0.010	mg/L	2022-05-01	
Manganese, dissolved	**0.00883**	0.00020	mg/L	2022-05-01	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2022-05-04	
Molybdenum, dissolved	**0.00010**	0.00010	mg/L	2022-05-01	
Nickel, dissolved	< 0.00040	0.00040	mg/L	2022-05-01	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2022-05-01	
Potassium, dissolved	**0.79**	0.10	mg/L	2022-05-01	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2022-05-01	
Silicon, dissolved	**4.4**	1.0	mg/L	2022-05-01	
Silver, dissolved	< 0.000050	0.000050	mg/L	2022-05-01	
Sodium, dissolved	**2.65**	0.10	mg/L	2022-05-01	
Strontium, dissolved	**0.0416**	0.0010	mg/L	2022-05-01	
Sulfur, dissolved	< 3.0	3.0	mg/L	2022-05-01	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2022-05-01	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
TW06-04 (22D3722-01) | Matrix: Water | Sampled: 2022-04-27, Continued					F2
Dissolved Metals, Continued					
Thallium, dissolved	< 0.000020	0.000020	mg/L	2022-05-01	
Thorium, dissolved	< 0.00010	0.00002	mg/L	2022-05-01	
Tin, dissolved	**0.00026**	0.00020	mg/L	2022-05-01	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2022-05-01	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2022-05-01	
Uranium, dissolved	**0.000036**	0.000020	mg/L	2022-05-01	
Vanadium, dissolved	< 0.0010	0.0050	mg/L	2022-05-01	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2022-05-01	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2022-05-01	
General Parameters					
Alkalinity, Total (as CaCO3)	**1.5**	1.0	mg/L	2022-05-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Bicarbonate (as CaCO3)	**1.5**	1.0	mg/L	2022-05-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Conductivity (EC)	**53.9**	2.0	µS/cm	2022-05-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2022-04-30	
pH	**6.52**	0.10	pH units	2022-05-03	HT2
Turbidity	**140**	0.10	NTU	2022-05-02	HT1
Glycols					
Propylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Ethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Diethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Triethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Surrogate: Tetramethylene Glycol	*98*	*70-130*	%	*2022-05-02*	
Total Metals					
Aluminum, total	**0.0063**	0.0050	mg/L	2022-05-02	
Antimony, total	< 0.00020	0.00020	mg/L	2022-05-02	
Arsenic, total	< 0.00050	0.00050	mg/L	2022-05-02	
Barium, total	**0.0184**	0.0050	mg/L	2022-05-02	
Boron, total	< 0.0500	0.0500	mg/L	2022-05-02	
Cadmium, total	**0.000021**	0.000010	mg/L	2022-05-02	
Calcium, total	**5.56**	0.20	mg/L	2022-05-02	
Chromium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Copper, total	**0.00057**	0.00040	mg/L	2022-05-02	
Iron, total	**0.508**	0.010	mg/L	2022-05-02	
Lead, total	< 0.00020	0.00020	mg/L	2022-05-02	
Magnesium, total	**0.991**	0.010	mg/L	2022-05-02	
Manganese, total	**0.0108**	0.00020	mg/L	2022-05-02	
Potassium, total	**0.81**	0.10	mg/L	2022-05-02	
Selenium, total	< 0.00050	0.00050	mg/L	2022-05-02	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
TW06-04 (22D3722-01) | Matrix: Water | Sampled: 2022-04-27, Continued					F2
Total Metals, Continued					
Sodium, total	**2.52**	0.10	mg/L	2022-05-02	
Strontium, total	**0.0415**	0.0010	mg/L	2022-05-02	
Uranium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Zinc, total	**0.0045**	0.0040	mg/L	2022-05-02	
P1 (22D3722-02) | Matrix: Water | Sampled: 2022-04-27					
****** DEFAULT GENERAL METHOD ******					
Abamectin	< 0.01	0.01	µg/g	2022-05-11	
Acephate	< 0.01	0.01	µg/g	2022-05-11	
Acetamiprid	< 0.01	0.01	µg/g	2022-05-11	
Acequinocyl	< 0.01	0.01	µg/g	2022-05-11	
Aldicarb	< 0.01	0.01	µg/g	2022-05-11	
Allethrin	< 0.01	0.01	µg/g	2022-05-11	
Azadirachtin	< 0.01	0.01	µg/g	2022-05-11	
Azoxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Benzovindiflupyr	< 0.01	0.01	µg/g	2022-05-11	
Bifenazate	< 0.01	0.01	µg/g	2022-05-11	
Bifenthrin	< 0.01	0.01	µg/g	2022-05-11	
Boscalid	< 0.01	0.01	µg/g	2022-05-11	
Buprofezin	< 0.01	0.01	µg/g	2022-05-11	
Carbaryl	< 0.01	0.01	µg/g	2022-05-11	
Carbofuran	< 0.01	0.01	µg/g	2022-05-11	
Chlorantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Chlorfenapyr	< 0.01	0.01	µg/g	2022-05-11	
Chlorpyrifos	< 0.01	0.01	µg/g	2022-05-11	
Clofentezine	< 0.01	0.01	µg/g	2022-05-11	
Clothianidin	< 0.01	0.01	µg/g	2022-05-11	
Coumaphos	< 0.01	0.01	µg/g	2022-05-11	
Cyantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Cyfluthrin (I, II, III, IV)	< 0.01	0.01	µg/g	2022-05-11	
Cypermethrin	< 0.02	0.02	µg/g	2022-05-11	
Cyprodinil	< 0.01	0.01	µg/g	2022-05-11	
Daminozide	< 0.02	0.02	µg/g	2022-05-11	
Deltamethrin	< 0.02	0.02	µg/g	2022-05-11	
Diazinon	< 0.01	0.01	µg/g	2022-05-11	
Dichlorvos	< 0.01	0.01	µg/g	2022-05-11	
Dimethoate	< 0.01	0.01	µg/g	2022-05-11	
Dimethomorph	< 0.01	0.01	µg/g	2022-05-11	
Dinotefuran	< 0.01	0.01	µg/g	2022-05-11	
Dodemorph	< 0.01	0.01	µg/g	2022-05-11	
Ethoprop	< 0.01	0.01	µg/g	2022-05-11	
Etofenprox	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
P1 (22D3722-02) | Matrix: Water | Sampled: 2022-04-27, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Etoxazole	< 0.01	0.01	µg/g	2022-05-11	
Fenoxycarb	< 0.01	0.01	µg/g	2022-05-11	
Fenpyroximate	< 0.01	0.01	µg/g	2022-05-11	
Fensulfothion	< 0.01	0.01	µg/g	2022-05-11	
Fenthion	< 0.01	0.01	µg/g	2022-05-11	
Flonicamid	< 0.01	0.01	µg/g	2022-05-11	
Fluopyram	< 0.01	0.01	µg/g	2022-05-11	
Hexythiazox	< 0.01	0.01	µg/g	2022-05-11	
Imazalil	< 0.01	0.01	µg/g	2022-05-11	
Imidacloprid	< 0.01	0.01	µg/g	2022-05-11	
Iprodione	< 0.02	0.02	µg/g	2022-05-11	
Kinoprene	< 0.01	0.01	µg/g	2022-05-11	
Kresoxim-methyl	< 0.01	0.01	µg/g	2022-05-11	
Malathion	< 0.01	0.01	µg/g	2022-05-11	
Metalaxyl	< 0.01	0.01	µg/g	2022-05-11	
Methiocarb	< 0.01	0.01	µg/g	2022-05-11	
Methomyl	< 0.01	0.01	µg/g	2022-05-11	
Methoprene	< 0.01	0.01	µg/g	2022-05-11	
Methyl parathion	< 0.02	0.02	µg/g	2022-05-11	
Mevinphos	< 0.01	0.01	µg/g	2022-05-11	
MGK-264	< 0.01	0.01	µg/g	2022-05-11	
Myclobutanil	< 0.01	0.01	µg/g	2022-05-11	
Naled	< 0.01	0.01	µg/g	2022-05-11	
Novaluron	< 0.01	0.01	µg/g	2022-05-11	
Oxamyl	< 0.01	0.01	µg/g	2022-05-11	
Paclobutrazol	< 0.01	0.01	µg/g	2022-05-11	
Permethrin	< 0.02	0.02	µg/g	2022-05-11	
Phenothrin	< 0.01	0.01	µg/g	2022-05-11	
Phosmet	< 0.01	0.01	µg/g	2022-05-11	
Piperonyl butoxide	< 0.01	0.01	µg/g	2022-05-11	
Pirimicarb	< 0.01	0.01	µg/g	2022-05-11	
Prallethrin	< 0.01	0.01	µg/g	2022-05-11	
Propiconazole	< 0.01	0.01	µg/g	2022-05-11	
Propoxur	< 0.01	0.01	µg/g	2022-05-11	
Pyraclostrobin	< 0.01	0.01	µg/g	2022-05-11	
Pyrethrin	< 0.01	0.01	µg/g	2022-05-11	
Pyridaben	< 0.01	0.01	µg/g	2022-05-11	
Resmethrin	< 0.01	0.01	µg/g	2022-05-11	
Spinetoram	< 0.01	0.01	µg/g	2022-05-11	
Spinosad	< 0.01	0.01	µg/g	2022-05-11	
Spirodiclofen	< 0.01	0.01	µg/g	2022-05-11	
Spiromesifen	< 0.01	0.01	µg/g	2022-05-11	
Spirotetramat	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
P1 (22D3722-02) | Matrix: Water | Sampled: 2022-04-27, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Spiroxamine	< 0.02	0.02	µg/g	2022-05-11	
Tebuconazole	< 0.01	0.01	µg/g	2022-05-11	
Tebufenozide	< 0.01	0.01	µg/g	2022-05-11	
Teflubenzuron	< 0.01	0.01	µg/g	2022-05-11	
Tetrachlorvinphos	< 0.01	0.01	µg/g	2022-05-11	
Tetramethrin	< 0.01	0.01	µg/g	2022-05-11	
Thiacloprid	< 0.01	0.01	µg/g	2022-05-11	
Thiamethoxam	< 0.01	0.01	µg/g	2022-05-11	
Thiophanate methyl	< 0.01	0.01	µg/g	2022-05-11	
Trifloxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Anions					
Chloride	**2.17**	0.10	mg/L	2022-04-30	
Fluoride	< 0.10	0.10	mg/L	2022-04-30	
Nitrate (as N)	**0.615**	0.010	mg/L	2022-04-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2022-04-30	
Sulfate	**3.7**	1.0	mg/L	2022-04-30	
Calculated Parameters					
Hardness, Total (as CaCO3)	**16.8**	0.500	mg/L	N/A	
Solids, Total Dissolved	**32.9**	1.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**21.7**	1.0	mg/L	2022-05-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Bicarbonate (as CaCO3)	**21.7**	1.0	mg/L	2022-05-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Conductivity (EC)	**54.7**	2.0	µS/cm	2022-05-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2022-04-30	
pH	**6.42**	0.10	pH units	2022-05-03	HT2
Turbidity	**1.02**	0.10	NTU	2022-05-02	HT1
Glycols					
Propylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Ethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Diethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Triethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Surrogate: Tetramethylene Glycol	*94*	*70-130*	%	*2022-05-02*	
Total Metals					
Aluminum, total	**0.0116**	0.0050	mg/L	2022-05-02	
Antimony, total	< 0.00020	0.00020	mg/L	2022-05-02	
Arsenic, total	< 0.00050	0.00050	mg/L	2022-05-02	
Barium, total	**0.0059**	0.0050	mg/L	2022-05-02	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
P1 (22D3722-02) | Matrix: Water | Sampled: 2022-04-27, Continued					
Total Metals, Continued					
Beryllium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Bismuth, total	< 0.00010	0.00010	mg/L	2022-05-02	
Boron, total	< 0.0500	0.0500	mg/L	2022-05-02	
Cadmium, total	**0.000018**	0.000010	mg/L	2022-05-02	
Calcium, total	**5.24**	0.20	mg/L	2022-05-02	
Chromium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Cobalt, total	< 0.00010	0.00010	mg/L	2022-05-02	
Copper, total	**0.00909**	0.00040	mg/L	2022-05-02	
Iron, total	**0.463**	0.010	mg/L	2022-05-02	
Lead, total	**0.00041**	0.00020	mg/L	2022-05-02	
Lithium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Magnesium, total	**0.909**	0.010	mg/L	2022-05-02	
Manganese, total	**0.00351**	0.00020	mg/L	2022-05-02	
Mercury, total	< 0.000010	0.000010	mg/L	2022-05-04	
Molybdenum, total	**0.00030**	0.00010	mg/L	2022-05-02	
Nickel, total	< 0.00040	0.00040	mg/L	2022-05-02	
Phosphorus, total	< 0.050	0.050	mg/L	2022-05-02	
Potassium, total	**0.66**	0.10	mg/L	2022-05-02	
Selenium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Silicon, total	**7.3**	1.0	mg/L	2022-05-02	
Silver, total	< 0.000050	0.000050	mg/L	2022-05-02	
Sodium, total	**4.27**	0.10	mg/L	2022-05-02	
Strontium, total	**0.0441**	0.0010	mg/L	2022-05-02	
Sulfur, total	< 3.0	3.0	mg/L	2022-05-02	
Tellurium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Thallium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Thorium, total	< 0.00010	0.00002	mg/L	2022-05-02	
Tin, total	**0.00073**	0.00020	mg/L	2022-05-02	
Titanium, total	< 0.0050	0.0050	mg/L	2022-05-02	
Tungsten, total	< 0.0002	0.0010	mg/L	2022-05-02	
Uranium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Vanadium, total	< 0.0010	0.0050	mg/L	2022-05-02	
Zinc, total	**0.0069**	0.0040	mg/L	2022-05-02	
Zirconium, total	< 0.00010	0.00010	mg/L	2022-05-02	
WPN1052 (22D3722-03) | Matrix: Water | Sampled: 2022-04-27					
****** DEFAULT GENERAL METHOD ******					
Abamectin	< 0.01	0.01	µg/g	2022-05-11	
Acephate	< 0.01	0.01	µg/g	2022-05-11	
Acetamiprid	< 0.01	0.01	µg/g	2022-05-11	
Acequinocyl	< 0.01	0.01	µg/g	2022-05-11	
Aldicarb	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
WPN1052 (22D3722-03) | Matrix: Water | Sampled: 2022-04-27, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Allethrin	< 0.01	0.01	µg/g	2022-05-11	
Azadirachtin	< 0.01	0.01	µg/g	2022-05-11	
Azoxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Benzovindiflupyr	< 0.01	0.01	µg/g	2022-05-11	
Bifenazate	< 0.01	0.01	µg/g	2022-05-11	
Bifenthrin	< 0.01	0.01	µg/g	2022-05-11	
Boscalid	< 0.01	0.01	µg/g	2022-05-11	
Buprofezin	< 0.01	0.01	µg/g	2022-05-11	
Carbaryl	< 0.01	0.01	µg/g	2022-05-11	
Carbofuran	< 0.01	0.01	µg/g	2022-05-11	
Chlorantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Chlorfenapyr	< 0.01	0.01	µg/g	2022-05-11	
Chlorpyrifos	< 0.01	0.01	µg/g	2022-05-11	
Clofentezine	< 0.01	0.01	µg/g	2022-05-11	
Clothianidin	< 0.01	0.01	µg/g	2022-05-11	
Coumaphos	< 0.01	0.01	µg/g	2022-05-11	
Cyantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Cyfluthrin (I, II, III, IV)	< 0.01	0.01	µg/g	2022-05-11	
Cypermethrin	< 0.02	0.02	µg/g	2022-05-11	
Cyprodinil	< 0.01	0.01	µg/g	2022-05-11	
Daminozide	< 0.02	0.02	µg/g	2022-05-11	
Deltamethrin	< 0.02	0.02	µg/g	2022-05-11	
Diazinon	< 0.01	0.01	µg/g	2022-05-11	
Dichlorvos	< 0.01	0.01	µg/g	2022-05-11	
Dimethoate	< 0.01	0.01	µg/g	2022-05-11	
Dimethomorph	< 0.01	0.01	µg/g	2022-05-11	
Dinotefuran	< 0.01	0.01	µg/g	2022-05-11	
Dodemorph	< 0.01	0.01	µg/g	2022-05-11	
Ethoprop	< 0.01	0.01	µg/g	2022-05-11	
Etofenprox	< 0.01	0.01	µg/g	2022-05-11	
Etoxazole	< 0.01	0.01	µg/g	2022-05-11	
Fenoxycarb	< 0.01	0.01	µg/g	2022-05-11	
Fenpyroximate	< 0.01	0.01	µg/g	2022-05-11	
Fensulfothion	< 0.01	0.01	µg/g	2022-05-11	
Fenthion	< 0.01	0.01	µg/g	2022-05-11	
Flonicamid	< 0.01	0.01	µg/g	2022-05-11	
Fluopyram	< 0.01	0.01	µg/g	2022-05-11	
Hexythiazox	< 0.01	0.01	µg/g	2022-05-11	
Imazalil	< 0.01	0.01	µg/g	2022-05-11	
Imidacloprid	< 0.01	0.01	µg/g	2022-05-11	
Iprodione	< 0.02	0.02	µg/g	2022-05-11	
Kinoprene	< 0.01	0.01	µg/g	2022-05-11	
Kresoxim-methyl	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
WPN1052 (22D3722-03) | Matrix: Water | Sampled: 2022-04-27, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Malathion	< 0.01	0.01	µg/g	2022-05-11	
Metalaxyl	< 0.01	0.01	µg/g	2022-05-11	
Methiocarb	< 0.01	0.01	µg/g	2022-05-11	
Methomyl	< 0.01	0.01	µg/g	2022-05-11	
Methoprene	< 0.01	0.01	µg/g	2022-05-11	
Methyl parathion	< 0.02	0.02	µg/g	2022-05-11	
Mevinphos	< 0.01	0.01	µg/g	2022-05-11	
MGK-264	< 0.01	0.01	µg/g	2022-05-11	
Myclobutanil	< 0.01	0.01	µg/g	2022-05-11	
Naled	< 0.01	0.01	µg/g	2022-05-11	
Novaluron	< 0.01	0.01	µg/g	2022-05-11	
Oxamyl	< 0.01	0.01	µg/g	2022-05-11	
Paclobutrazol	< 0.01	0.01	µg/g	2022-05-11	
Permethrin	< 0.02	0.02	µg/g	2022-05-11	
Phenothrin	< 0.01	0.01	µg/g	2022-05-11	
Phosmet	< 0.01	0.01	µg/g	2022-05-11	
Piperonyl butoxide	< 0.01	0.01	µg/g	2022-05-11	
Pirimicarb	< 0.01	0.01	µg/g	2022-05-11	
Prallethrin	< 0.01	0.01	µg/g	2022-05-11	
Propiconazole	< 0.01	0.01	µg/g	2022-05-11	
Propoxur	< 0.01	0.01	µg/g	2022-05-11	
Pyraclostrobin	< 0.01	0.01	µg/g	2022-05-11	
Pyrethrin	< 0.01	0.01	µg/g	2022-05-11	
Pyridaben	< 0.01	0.01	µg/g	2022-05-11	
Resmethrin	< 0.01	0.01	µg/g	2022-05-11	
Spinetoram	< 0.01	0.01	µg/g	2022-05-11	
Spinosad	< 0.01	0.01	µg/g	2022-05-11	
Spirodiclofen	< 0.01	0.01	µg/g	2022-05-11	
Spiromesifen	< 0.01	0.01	µg/g	2022-05-11	
Spirotetramat	< 0.01	0.01	µg/g	2022-05-11	
Spiroxamine	< 0.02	0.02	µg/g	2022-05-11	
Tebuconazole	< 0.01	0.01	µg/g	2022-05-11	
Tebufenozide	< 0.01	0.01	µg/g	2022-05-11	
Teflubenzuron	< 0.01	0.01	µg/g	2022-05-11	
Tetrachlorvinphos	< 0.01	0.01	µg/g	2022-05-11	
Tetramethrin	< 0.01	0.01	µg/g	2022-05-11	
Thiacloprid	< 0.01	0.01	µg/g	2022-05-11	
Thiamethoxam	< 0.01	0.01	µg/g	2022-05-11	
Thiophanate methyl	< 0.01	0.01	µg/g	2022-05-11	
Trifloxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Anions					
Chloride	**2.92**	0.10	mg/L	2022-04-30	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
WPN1052 (22D3722-03) | Matrix: Water | Sampled: 2022-04-27, Continued					
Anions, Continued					
Fluoride	< 0.10	0.10	mg/L	2022-04-30	
Nitrate (as N)	**0.069**	0.010	mg/L	2022-04-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2022-04-30	
Sulfate	**1.8**	1.0	mg/L	2022-04-30	
Calculated Parameters					
Hardness, Total (as CaCO3)	**25.3**	0.500	mg/L	N/A	
Solids, Total Dissolved	**40.3**	1.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**34.6**	1.0	mg/L	2022-05-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Bicarbonate (as CaCO3)	**34.6**	1.0	mg/L	2022-05-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Conductivity (EC)	**69.6**	2.0	µS/cm	2022-05-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2022-04-30	
pH	**6.61**	0.10	pH units	2022-05-03	HT2
Turbidity	**37.1**	0.10	NTU	2022-05-02	HT1
Glycols					
Propylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Ethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Diethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Triethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Surrogate: Tetramethylene Glycol	*99*	*70-130*	%	*2022-05-02*	
Total Metals					
Aluminum, total	**0.0154**	0.0050	mg/L	2022-05-02	
Antimony, total	< 0.00020	0.00020	mg/L	2022-05-02	
Arsenic, total	< 0.00050	0.00050	mg/L	2022-05-02	
Barium, total	**0.0132**	0.0050	mg/L	2022-05-02	
Beryllium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Bismuth, total	< 0.00010	0.00010	mg/L	2022-05-02	
Boron, total	< 0.0500	0.0500	mg/L	2022-05-02	
Cadmium, total	**0.000027**	0.000010	mg/L	2022-05-02	
Calcium, total	**8.42**	0.20	mg/L	2022-05-02	
Chromium, total	**0.00069**	0.00050	mg/L	2022-05-02	
Cobalt, total	**0.00044**	0.00010	mg/L	2022-05-02	
Copper, total	**0.00074**	0.00040	mg/L	2022-05-02	
Iron, total	**4.59**	0.010	mg/L	2022-05-02	
Lead, total	< 0.00020	0.00020	mg/L	2022-05-02	
Lithium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Magnesium, total	**1.03**	0.010	mg/L	2022-05-02	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
WPN1052 (22D3722-03) | Matrix: Water | Sampled: 2022-04-27, Continued					
Total Metals, Continued					
Manganese, total	**0.0732**	0.00020	mg/L	2022-05-02	
Mercury, total	< 0.000010	0.000010	mg/L	2022-05-05	
Molybdenum, total	**0.00038**	0.00010	mg/L	2022-05-02	
Nickel, total	**0.00075**	0.00040	mg/L	2022-05-02	
Phosphorus, total	< 0.050	0.050	mg/L	2022-05-02	
Potassium, total	**0.61**	0.10	mg/L	2022-05-02	
Selenium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Silicon, total	**8.1**	1.0	mg/L	2022-05-02	
Silver, total	< 0.000050	0.000050	mg/L	2022-05-02	
Sodium, total	**4.14**	0.10	mg/L	2022-05-02	
Strontium, total	**0.0522**	0.0010	mg/L	2022-05-02	
Sulfur, total	< 3.0	3.0	mg/L	2022-05-02	
Tellurium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Thallium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Thorium, total	< 0.00010	0.00002	mg/L	2022-05-02	
Tin, total	**0.00011**	0.00020	mg/L	2022-05-02	
Titanium, total	< 0.0050	0.0050	mg/L	2022-05-02	
Tungsten, total	< 0.0002	0.0010	mg/L	2022-05-02	
Uranium, total	**0.000025**	0.000020	mg/L	2022-05-02	
Vanadium, total	< 0.0010	0.0050	mg/L	2022-05-02	
Zinc, total	< 0.0040	0.0040	mg/L	2022-05-02	
Zirconium, total	< 0.00010	0.00010	mg/L	2022-05-02	
M1S (22D3722-04) | Matrix: Water | Sampled: 2022-04-28					
****** DEFAULT GENERAL METHOD ******					
Abamectin	< 0.01	0.01	µg/g	2022-05-11	
Acephate	< 0.01	0.01	µg/g	2022-05-11	
Acetamiprid	< 0.01	0.01	µg/g	2022-05-11	
Acequinocyl	< 0.01	0.01	µg/g	2022-05-11	
Aldicarb	< 0.01	0.01	µg/g	2022-05-11	
Allethrin	< 0.01	0.01	µg/g	2022-05-11	
Azadirachtin	< 0.01	0.01	µg/g	2022-05-11	
Azoxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Benzovindiflupyr	< 0.01	0.01	µg/g	2022-05-11	
Bifenazate	< 0.01	0.01	µg/g	2022-05-11	
Bifenthrin	< 0.01	0.01	µg/g	2022-05-11	
Boscalid	< 0.01	0.01	µg/g	2022-05-11	
Buprofezin	< 0.01	0.01	µg/g	2022-05-11	
Carbaryl	< 0.01	0.01	µg/g	2022-05-11	
Carbofuran	< 0.01	0.01	µg/g	2022-05-11	
Chlorantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Chlorfenapyr	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
M1S (22D3722-04) | Matrix: Water | Sampled: 2022-04-28, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Chlorpyrifos	< 0.01	0.01	µg/g	2022-05-11	
Clofentezine	< 0.01	0.01	µg/g	2022-05-11	
Clothianidin	< 0.01	0.01	µg/g	2022-05-11	
Coumaphos	< 0.01	0.01	µg/g	2022-05-11	
Cyantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Cyfluthrin (I, II, III, IV)	< 0.01	0.01	µg/g	2022-05-11	
Cypermethrin	< 0.02	0.02	µg/g	2022-05-11	
Cyprodinil	< 0.01	0.01	µg/g	2022-05-11	
Daminozide	< 0.02	0.02	µg/g	2022-05-11	
Deltamethrin	< 0.02	0.02	µg/g	2022-05-11	
Diazinon	< 0.01	0.01	µg/g	2022-05-11	
Dichlorvos	< 0.01	0.01	µg/g	2022-05-11	
Dimethoate	< 0.01	0.01	µg/g	2022-05-11	
Dimethomorph	< 0.01	0.01	µg/g	2022-05-11	
Dinotefuran	< 0.01	0.01	µg/g	2022-05-11	
Dodemorph	< 0.01	0.01	µg/g	2022-05-11	
Ethoprop	< 0.01	0.01	µg/g	2022-05-11	
Etofenprox	< 0.01	0.01	µg/g	2022-05-11	
Etoxazole	< 0.01	0.01	µg/g	2022-05-11	
Fenoxycarb	< 0.01	0.01	µg/g	2022-05-11	
Fenpyroximate	< 0.01	0.01	µg/g	2022-05-11	
Fensulfothion	< 0.01	0.01	µg/g	2022-05-11	
Fenthion	< 0.01	0.01	µg/g	2022-05-11	
Flonicamid	< 0.01	0.01	µg/g	2022-05-11	
Fluopyram	< 0.01	0.01	µg/g	2022-05-11	
Hexythiazox	< 0.01	0.01	µg/g	2022-05-11	
Imazalil	< 0.01	0.01	µg/g	2022-05-11	
Imidacloprid	< 0.01	0.01	µg/g	2022-05-11	
Iprodione	< 0.02	0.02	µg/g	2022-05-11	
Kinoprene	< 0.01	0.01	µg/g	2022-05-11	
Kresoxim-methyl	< 0.01	0.01	µg/g	2022-05-11	
Malathion	< 0.01	0.01	µg/g	2022-05-11	
Metalaxyl	< 0.01	0.01	µg/g	2022-05-11	
Methiocarb	< 0.01	0.01	µg/g	2022-05-11	
Methomyl	< 0.01	0.01	µg/g	2022-05-11	
Methoprene	< 0.01	0.01	µg/g	2022-05-11	
Methyl parathion	< 0.02	0.02	µg/g	2022-05-11	
Mevinphos	< 0.01	0.01	µg/g	2022-05-11	
MGK-264	< 0.01	0.01	µg/g	2022-05-11	
Myclobutanil	< 0.01	0.01	µg/g	2022-05-11	
Naled	< 0.01	0.01	µg/g	2022-05-11	
Novaluron	< 0.01	0.01	µg/g	2022-05-11	
Oxamyl	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
M1S (22D3722-04) | Matrix: Water | Sampled: 2022-04-28, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Paclobutrazol	< 0.01	0.01	µg/g	2022-05-11	
Permethrin	< 0.02	0.02	µg/g	2022-05-11	
Phenothrin	< 0.01	0.01	µg/g	2022-05-11	
Phosmet	< 0.01	0.01	µg/g	2022-05-11	
Piperonyl butoxide	< 0.01	0.01	µg/g	2022-05-11	
Pirimicarb	< 0.01	0.01	µg/g	2022-05-11	
Prallethrin	< 0.01	0.01	µg/g	2022-05-11	
Propiconazole	< 0.01	0.01	µg/g	2022-05-11	
Propoxur	< 0.01	0.01	µg/g	2022-05-11	
Pyraclostrobin	< 0.01	0.01	µg/g	2022-05-11	
Pyrethrin	< 0.01	0.01	µg/g	2022-05-11	
Pyridaben	< 0.01	0.01	µg/g	2022-05-11	
Resmethrin	< 0.01	0.01	µg/g	2022-05-11	
Spinetoram	< 0.01	0.01	µg/g	2022-05-11	
Spinosad	< 0.01	0.01	µg/g	2022-05-11	
Spirodiclofen	< 0.01	0.01	µg/g	2022-05-11	
Spiromesifen	< 0.01	0.01	µg/g	2022-05-11	
Spirotetramat	< 0.01	0.01	µg/g	2022-05-11	
Spiroxamine	< 0.02	0.02	µg/g	2022-05-11	
Tebuconazole	< 0.01	0.01	µg/g	2022-05-11	
Tebufenozide	< 0.01	0.01	µg/g	2022-05-11	
Teflubenzuron	< 0.01	0.01	µg/g	2022-05-11	
Tetrachlorvinphos	< 0.01	0.01	µg/g	2022-05-11	
Tetramethrin	< 0.01	0.01	µg/g	2022-05-11	
Thiacloprid	< 0.01	0.01	µg/g	2022-05-11	
Thiamethoxam	< 0.01	0.01	µg/g	2022-05-11	
Thiophanate methyl	< 0.01	0.01	µg/g	2022-05-11	
Trifloxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Anions					
Chloride	**1.07**	0.10	mg/L	2022-04-30	
Fluoride	< 0.10	0.10	mg/L	2022-04-30	
Nitrate (as N)	**0.146**	0.010	mg/L	2022-04-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2022-04-30	
Sulfate	**2.1**	1.0	mg/L	2022-04-30	
Calculated Parameters					
Hardness, Total (as CaCO3)	**8.36**	0.500	mg/L	N/A	
Solids, Total Dissolved	**13.0**	1.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**7.5**	1.0	mg/L	2022-05-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Bicarbonate (as CaCO3)	**7.5**	1.0	mg/L	2022-05-03	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
M1S (22D3722-04) | Matrix: Water | Sampled: 2022-04-28, Continued					
General Parameters, Continued					
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Conductivity (EC)	**23.8**	2.0	µS/cm	2022-05-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2022-04-30	
pH	**6.40**	0.10	pH units	2022-05-03	HT2
Turbidity	**0.14**	0.10	NTU	2022-05-02	HT1
Glycols					
Propylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Ethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Diethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Triethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Surrogate: Tetramethylene Glycol	*90*	*70-130*	%	*2022-05-02*	
Total Metals					
Aluminum, total	**0.0206**	0.0050	mg/L	2022-05-02	
Antimony, total	< 0.00020	0.00020	mg/L	2022-05-02	
Arsenic, total	< 0.00050	0.00050	mg/L	2022-05-02	
Barium, total	**0.0061**	0.0050	mg/L	2022-05-02	
Beryllium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Bismuth, total	< 0.00010	0.00010	mg/L	2022-05-02	
Boron, total	< 0.0500	0.0500	mg/L	2022-05-02	
Cadmium, total	**0.000057**	0.000010	mg/L	2022-05-02	
Calcium, total	**2.81**	0.20	mg/L	2022-05-02	
Chromium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Cobalt, total	< 0.00010	0.00010	mg/L	2022-05-02	
Copper, total	**0.00090**	0.00040	mg/L	2022-05-02	
Iron, total	**0.025**	0.010	mg/L	2022-05-02	
Lead, total	< 0.00020	0.00020	mg/L	2022-05-02	
Lithium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Magnesium, total	**0.325**	0.010	mg/L	2022-05-02	
Manganese, total	**0.00133**	0.00020	mg/L	2022-05-02	
Mercury, total	< 0.000010	0.000010	mg/L	2022-05-05	
Molybdenum, total	**0.00024**	0.00010	mg/L	2022-05-02	
Nickel, total	< 0.00040	0.00040	mg/L	2022-05-02	
Phosphorus, total	< 0.050	0.050	mg/L	2022-05-02	
Potassium, total	**0.28**	0.10	mg/L	2022-05-02	
Selenium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Silicon, total	**3.0**	1.0	mg/L	2022-05-02	
Silver, total	< 0.000050	0.000050	mg/L	2022-05-02	
Sodium, total	**1.16**	0.10	mg/L	2022-05-02	
Strontium, total	**0.0136**	0.0010	mg/L	2022-05-02	
Sulfur, total	< 3.0	3.0	mg/L	2022-05-02	
Tellurium, total	< 0.00050	0.00050	mg/L	2022-05-02	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
M1S (22D3722-04) | Matrix: Water | Sampled: 2022-04-28, Continued					
Total Metals, Continued					
Thallium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Thorium, total	< 0.00010	0.00002	mg/L	2022-05-02	
Tin, total	< 0.00004	0.00020	mg/L	2022-05-02	
Titanium, total	< 0.0050	0.0050	mg/L	2022-05-02	
Tungsten, total	< 0.0002	0.0010	mg/L	2022-05-02	
Uranium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Vanadium, total	< 0.0010	0.0050	mg/L	2022-05-02	
Zinc, total	< 0.0040	0.0040	mg/L	2022-05-02	
Zirconium, total	< 0.00010	0.00010	mg/L	2022-05-02	
TW06-03 (22D3722-05) | Matrix: Water | Sampled: 2022-04-28					
****** DEFAULT GENERAL METHOD ******					
Abamectin	< 0.01	0.01	µg/g	2022-05-11	
Acephate	< 0.01	0.01	µg/g	2022-05-11	
Acetamiprid	< 0.01	0.01	µg/g	2022-05-11	
Acequinocyl	< 0.01	0.01	µg/g	2022-05-11	
Aldicarb	< 0.01	0.01	µg/g	2022-05-11	
Allethrin	< 0.01	0.01	µg/g	2022-05-11	
Azadirachtin	< 0.01	0.01	µg/g	2022-05-11	
Azoxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Benzovindiflupyr	< 0.01	0.01	µg/g	2022-05-11	
Bifenazate	< 0.01	0.01	µg/g	2022-05-11	
Bifenthrin	< 0.01	0.01	µg/g	2022-05-11	
Boscalid	< 0.01	0.01	µg/g	2022-05-11	
Buprofezin	< 0.01	0.01	µg/g	2022-05-11	
Carbaryl	< 0.01	0.01	µg/g	2022-05-11	
Carbofuran	< 0.01	0.01	µg/g	2022-05-11	
Chlorantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Chlorfenapyr	< 0.01	0.01	µg/g	2022-05-11	
Chlorpyrifos	< 0.01	0.01	µg/g	2022-05-11	
Clofentezine	< 0.01	0.01	µg/g	2022-05-11	
Clothianidin	< 0.01	0.01	µg/g	2022-05-11	
Coumaphos	< 0.01	0.01	µg/g	2022-05-11	
Cyantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Cyfluthrin (I, II, III, IV)	< 0.01	0.01	µg/g	2022-05-11	
Cypermethrin	< 0.02	0.02	µg/g	2022-05-11	
Cyprodinil	< 0.01	0.01	µg/g	2022-05-11	
Daminozide	< 0.02	0.02	µg/g	2022-05-11	
Deltamethrin	< 0.02	0.02	µg/g	2022-05-11	
Diazinon	< 0.01	0.01	µg/g	2022-05-11	
Dichlorvos	< 0.01	0.01	µg/g	2022-05-11	
Dimethoate	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
TW06-03 (22D3722-05) | Matrix: Water | Sampled: 2022-04-28, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Dimethomorph	< 0.01	0.01	µg/g	2022-05-11	
Dinotefuran	< 0.01	0.01	µg/g	2022-05-11	
Dodemorph	< 0.01	0.01	µg/g	2022-05-11	
Ethoprop	< 0.01	0.01	µg/g	2022-05-11	
Etofenprox	< 0.01	0.01	µg/g	2022-05-11	
Etoxazole	< 0.01	0.01	µg/g	2022-05-11	
Fenoxycarb	< 0.01	0.01	µg/g	2022-05-11	
Fenpyroximate	< 0.01	0.01	µg/g	2022-05-11	
Fensulfothion	< 0.01	0.01	µg/g	2022-05-11	
Fenthion	< 0.01	0.01	µg/g	2022-05-11	
Flonicamid	< 0.01	0.01	µg/g	2022-05-11	
Fluopyram	< 0.01	0.01	µg/g	2022-05-11	
Hexythiazox	< 0.01	0.01	µg/g	2022-05-11	
Imazalil	< 0.01	0.01	µg/g	2022-05-11	
Imidacloprid	< 0.01	0.01	µg/g	2022-05-11	
Iprodione	< 0.02	0.02	µg/g	2022-05-11	
Kinoprene	< 0.01	0.01	µg/g	2022-05-11	
Kresoxim-methyl	< 0.01	0.01	µg/g	2022-05-11	
Malathion	< 0.01	0.01	µg/g	2022-05-11	
Metalaxyl	< 0.01	0.01	µg/g	2022-05-11	
Methiocarb	< 0.01	0.01	µg/g	2022-05-11	
Methomyl	< 0.01	0.01	µg/g	2022-05-11	
Methoprene	< 0.01	0.01	µg/g	2022-05-11	
Methyl parathion	< 0.02	0.02	µg/g	2022-05-11	
Mevinphos	< 0.01	0.01	µg/g	2022-05-11	
MGK-264	< 0.01	0.01	µg/g	2022-05-11	
Myclobutanil	< 0.01	0.01	µg/g	2022-05-11	
Naled	< 0.01	0.01	µg/g	2022-05-11	
Novaluron	< 0.01	0.01	µg/g	2022-05-11	
Oxamyl	< 0.01	0.01	µg/g	2022-05-11	
Paclobutrazol	< 0.01	0.01	µg/g	2022-05-11	
Permethrin	< 0.02	0.02	µg/g	2022-05-11	
Phenothrin	< 0.01	0.01	µg/g	2022-05-11	
Phosmet	< 0.01	0.01	µg/g	2022-05-11	
Piperonyl butoxide	< 0.01	0.01	µg/g	2022-05-11	
Pirimicarb	< 0.01	0.01	µg/g	2022-05-11	
Prallethrin	< 0.01	0.01	µg/g	2022-05-11	
Propiconazole	< 0.01	0.01	µg/g	2022-05-11	
Propoxur	< 0.01	0.01	µg/g	2022-05-11	
Pyraclostrobin	< 0.01	0.01	µg/g	2022-05-11	
Pyrethrin	< 0.01	0.01	µg/g	2022-05-11	
Pyridaben	< 0.01	0.01	µg/g	2022-05-11	
Resmethrin	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
TW06-03 (22D3722-05) | Matrix: Water | Sampled: 2022-04-28, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Spinetoram	< 0.01	0.01	µg/g	2022-05-11	
Spinosad	< 0.01	0.01	µg/g	2022-05-11	
Spirodiclofen	< 0.01	0.01	µg/g	2022-05-11	
Spiromesifen	< 0.01	0.01	µg/g	2022-05-11	
Spirotetramat	< 0.01	0.01	µg/g	2022-05-11	
Spiroxamine	< 0.02	0.02	µg/g	2022-05-11	
Tebuconazole	< 0.01	0.01	µg/g	2022-05-11	
Tebufenozide	< 0.01	0.01	µg/g	2022-05-11	
Teflubenzuron	< 0.01	0.01	µg/g	2022-05-11	
Tetrachlorvinphos	< 0.01	0.01	µg/g	2022-05-11	
Tetramethrin	< 0.01	0.01	µg/g	2022-05-11	
Thiacloprid	< 0.01	0.01	µg/g	2022-05-11	
Thiamethoxam	< 0.01	0.01	µg/g	2022-05-11	
Thiophanate methyl	< 0.01	0.01	µg/g	2022-05-11	
Trifloxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Anions					
Chloride	**24.8**	0.10	mg/L	2022-04-30	
Fluoride	< 0.10	0.10	mg/L	2022-04-30	
Nitrate (as N)	**0.821**	0.010	mg/L	2022-04-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2022-04-30	
Sulfate	< 1.0	1.0	mg/L	2022-04-30	
Calculated Parameters					
Hardness, Total (as CaCO3)	**12.1**	0.500	mg/L	N/A	
Solids, Total Dissolved	**58.4**	1.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**10.8**	1.0	mg/L	2022-05-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Bicarbonate (as CaCO3)	**10.8**	1.0	mg/L	2022-05-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Conductivity (EC)	**116**	2.0	µS/cm	2022-05-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2022-04-30	
pH	**6.42**	0.10	pH units	2022-05-03	HT2
Turbidity	**2.89**	0.10	NTU	2022-05-02	HT1
Glycols					
Propylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Ethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Diethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Triethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Surrogate: Tetramethylene Glycol	*100*	*70-130*	%	*2022-05-02*	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
TW06-03 (22D3722-05) | Matrix: Water | Sampled: 2022-04-28, Continued					
Total Metals					
Aluminum, total	**0.0142**	0.0050	mg/L	2022-05-02	
Antimony, total	< 0.00020	0.00020	mg/L	2022-05-02	
Arsenic, total	< 0.00050	0.00050	mg/L	2022-05-02	
Barium, total	**0.0410**	0.0050	mg/L	2022-05-02	
Beryllium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Bismuth, total	< 0.00010	0.00010	mg/L	2022-05-02	
Boron, total	< 0.0500	0.0500	mg/L	2022-05-02	
Cadmium, total	**0.000019**	0.000010	mg/L	2022-05-02	
Calcium, total	**3.84**	0.20	mg/L	2022-05-02	
Chromium, total	**0.00052**	0.00050	mg/L	2022-05-02	
Cobalt, total	**0.00011**	0.00010	mg/L	2022-05-02	
Copper, total	< 0.00040	0.00040	mg/L	2022-05-02	
Iron, total	**0.799**	0.010	mg/L	2022-05-02	
Lead, total	< 0.00020	0.00020	mg/L	2022-05-02	
Lithium, total	**0.00011**	0.00010	mg/L	2022-05-02	
Magnesium, total	**0.612**	0.010	mg/L	2022-05-02	
Manganese, total	**0.0285**	0.00020	mg/L	2022-05-02	
Mercury, total	< 0.000010	0.000010	mg/L	2022-05-05	
Molybdenum, total	< 0.00010	0.00010	mg/L	2022-05-02	
Nickel, total	< 0.00040	0.00040	mg/L	2022-05-02	
Phosphorus, total	< 0.050	0.050	mg/L	2022-05-02	
Potassium, total	**1.94**	0.10	mg/L	2022-05-02	
Selenium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Silicon, total	**6.8**	1.0	mg/L	2022-05-02	
Silver, total	< 0.000050	0.000050	mg/L	2022-05-02	
Sodium, total	**17.0**	0.10	mg/L	2022-05-02	
Strontium, total	**0.0741**	0.0010	mg/L	2022-05-02	
Sulfur, total	< 3.0	3.0	mg/L	2022-05-02	
Tellurium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Thallium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Thorium, total	< 0.00010	0.00002	mg/L	2022-05-02	
Tin, total	< 0.00004	0.00020	mg/L	2022-05-02	
Titanium, total	< 0.0050	0.0050	mg/L	2022-05-02	
Tungsten, total	< 0.0002	0.0010	mg/L	2022-05-02	
Uranium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Vanadium, total	< 0.0010	0.0050	mg/L	2022-05-02	
Zinc, total	< 0.0040	0.0040	mg/L	2022-05-02	
Zirconium, total	< 0.00010	0.00010	mg/L	2022-05-02	
MW22-A (22D3722-06) | Matrix: Water | Sampled: 2022-04-27					
****** DEFAULT GENERAL METHOD ******					
Abamectin	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
MW22-A (22D3722-06) | Matrix: Water | Sampled: 2022-04-27, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Acephate	< 0.01	0.01	µg/g	2022-05-11	
Acetamiprid	< 0.01	0.01	µg/g	2022-05-11	
Acequinocyl	< 0.01	0.01	µg/g	2022-05-11	
Aldicarb	< 0.01	0.01	µg/g	2022-05-11	
Allethrin	< 0.01	0.01	µg/g	2022-05-11	
Azadirachtin	< 0.01	0.01	µg/g	2022-05-11	
Azoxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Benzovindiflupyr	< 0.01	0.01	µg/g	2022-05-11	
Bifenazate	< 0.01	0.01	µg/g	2022-05-11	
Bifenthrin	< 0.01	0.01	µg/g	2022-05-11	
Boscalid	< 0.01	0.01	µg/g	2022-05-11	
Buprofezin	< 0.01	0.01	µg/g	2022-05-11	
Carbaryl	< 0.01	0.01	µg/g	2022-05-11	
Carbofuran	< 0.01	0.01	µg/g	2022-05-11	
Chlorantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Chlorfenapyr	< 0.01	0.01	µg/g	2022-05-11	
Chlorpyrifos	< 0.01	0.01	µg/g	2022-05-11	
Clofentezine	< 0.01	0.01	µg/g	2022-05-11	
Clothianidin	< 0.01	0.01	µg/g	2022-05-11	
Coumaphos	< 0.01	0.01	µg/g	2022-05-11	
Cyantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Cyfluthrin (I, II, III, IV)	< 0.01	0.01	µg/g	2022-05-11	
Cypermethrin	< 0.02	0.02	µg/g	2022-05-11	
Cyprodinil	< 0.01	0.01	µg/g	2022-05-11	
Daminozide	< 0.02	0.02	µg/g	2022-05-11	
Deltamethrin	< 0.02	0.02	µg/g	2022-05-11	
Diazinon	< 0.01	0.01	µg/g	2022-05-11	
Dichlorvos	< 0.01	0.01	µg/g	2022-05-11	
Dimethoate	< 0.01	0.01	µg/g	2022-05-11	
Dimethomorph	< 0.01	0.01	µg/g	2022-05-11	
Dinotefuran	< 0.01	0.01	µg/g	2022-05-11	
Dodemorph	< 0.01	0.01	µg/g	2022-05-11	
Ethoprop	< 0.01	0.01	µg/g	2022-05-11	
Etofenprox	< 0.01	0.01	µg/g	2022-05-11	
Etoxazole	< 0.01	0.01	µg/g	2022-05-11	
Fenoxycarb	< 0.01	0.01	µg/g	2022-05-11	
Fenpyroximate	< 0.01	0.01	µg/g	2022-05-11	
Fensulfothion	< 0.01	0.01	µg/g	2022-05-11	
Fenthion	< 0.01	0.01	µg/g	2022-05-11	
Flonicamid	< 0.01	0.01	µg/g	2022-05-11	
Fluopyram	< 0.01	0.01	µg/g	2022-05-11	
Hexythiazox	< 0.01	0.01	µg/g	2022-05-11	
Imazalil	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
MW22-A (22D3722-06) | Matrix: Water | Sampled: 2022-04-27, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Imidacloprid	< 0.01	0.01	µg/g	2022-05-11	
Iprodione	< 0.02	0.02	µg/g	2022-05-11	
Kinoprene	< 0.01	0.01	µg/g	2022-05-11	
Kresoxim-methyl	< 0.01	0.01	µg/g	2022-05-11	
Malathion	< 0.01	0.01	µg/g	2022-05-11	
Metalaxyl	< 0.01	0.01	µg/g	2022-05-11	
Methiocarb	< 0.01	0.01	µg/g	2022-05-11	
Methomyl	< 0.01	0.01	µg/g	2022-05-11	
Methoprene	< 0.01	0.01	µg/g	2022-05-11	
Methyl parathion	< 0.02	0.02	µg/g	2022-05-11	
Mevinphos	< 0.01	0.01	µg/g	2022-05-11	
MGK-264	< 0.01	0.01	µg/g	2022-05-11	
Myclobutanil	< 0.01	0.01	µg/g	2022-05-11	
Naled	< 0.01	0.01	µg/g	2022-05-11	
Novaluron	< 0.01	0.01	µg/g	2022-05-11	
Oxamyl	< 0.01	0.01	µg/g	2022-05-11	
Paclobutrazol	< 0.01	0.01	µg/g	2022-05-11	
Permethrin	< 0.02	0.02	µg/g	2022-05-11	
Phenothrin	< 0.01	0.01	µg/g	2022-05-11	
Phosmet	< 0.01	0.01	µg/g	2022-05-11	
Piperonyl butoxide	< 0.01	0.01	µg/g	2022-05-11	
Pirimicarb	< 0.01	0.01	µg/g	2022-05-11	
Prallethrin	< 0.01	0.01	µg/g	2022-05-11	
Propiconazole	< 0.01	0.01	µg/g	2022-05-11	
Propoxur	< 0.01	0.01	µg/g	2022-05-11	
Pyraclostrobin	< 0.01	0.01	µg/g	2022-05-11	
Pyrethrin	< 0.01	0.01	µg/g	2022-05-11	
Pyridaben	< 0.01	0.01	µg/g	2022-05-11	
Resmethrin	< 0.01	0.01	µg/g	2022-05-11	
Spinetoram	< 0.01	0.01	µg/g	2022-05-11	
Spinosad	< 0.01	0.01	µg/g	2022-05-11	
Spirodiclofen	< 0.01	0.01	µg/g	2022-05-11	
Spiromesifen	< 0.01	0.01	µg/g	2022-05-11	
Spirotetramat	< 0.01	0.01	µg/g	2022-05-11	
Spiroxamine	< 0.02	0.02	µg/g	2022-05-11	
Tebuconazole	< 0.01	0.01	µg/g	2022-05-11	
Tebufenozide	< 0.01	0.01	µg/g	2022-05-11	
Teflubenzuron	< 0.01	0.01	µg/g	2022-05-11	
Tetrachlorvinphos	< 0.01	0.01	µg/g	2022-05-11	
Tetramethrin	< 0.01	0.01	µg/g	2022-05-11	
Thiacloprid	< 0.01	0.01	µg/g	2022-05-11	
Thiamethoxam	< 0.01	0.01	µg/g	2022-05-11	
Thiophanate methyl	< 0.01	0.01	µg/g	2022-05-11	

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
MW22-A (22D3722-06) | Matrix: Water | Sampled: 2022-04-27, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Trifloxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Anions					
Chloride	**2.91**	0.10	mg/L	2022-04-30	
Fluoride	< 0.10	0.10	mg/L	2022-04-30	
Nitrate (as N)	**0.068**	0.010	mg/L	2022-04-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2022-04-30	
Sulfate	**1.8**	1.0	mg/L	2022-04-30	
Calculated Parameters					
Hardness, Total (as CaCO3)	**24.8**	0.500	mg/L	N/A	
Solids, Total Dissolved	**40.0**	1.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**34.6**	1.0	mg/L	2022-05-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Bicarbonate (as CaCO3)	**34.6**	1.0	mg/L	2022-05-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Conductivity (EC)	**71.4**	2.0	µS/cm	2022-05-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2022-04-30	
pH	**6.45**	0.10	pH units	2022-05-03	HT2
Turbidity	**31.7**	0.10	NTU	2022-05-02	HT1
Glycols					
Propylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Ethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Diethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Triethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Surrogate: Tetramethylene Glycol	*95*	*70-130*	%	*2022-05-02*	
Total Metals					
Aluminum, total	**0.0183**	0.0050	mg/L	2022-05-02	
Antimony, total	< 0.00020	0.00020	mg/L	2022-05-02	
Arsenic, total	< 0.00050	0.00050	mg/L	2022-05-02	
Barium, total	**0.0125**	0.0050	mg/L	2022-05-02	
Beryllium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Bismuth, total	< 0.00010	0.00010	mg/L	2022-05-02	
Boron, total	< 0.0500	0.0500	mg/L	2022-05-02	
Cadmium, total	**0.000028**	0.000010	mg/L	2022-05-02	
Calcium, total	**8.27**	0.20	mg/L	2022-05-02	
Chromium, total	**0.00053**	0.00050	mg/L	2022-05-02	
Cobalt, total	**0.00043**	0.00010	mg/L	2022-05-02	
Copper, total	**0.00062**	0.00040	mg/L	2022-05-02	
Iron, total	**4.37**	0.010	mg/L	2022-05-02	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
MW22-A (22D3722-06) | Matrix: Water | Sampled: 2022-04-27, Continued					
Total Metals, Continued					
Lead, total	< 0.00020	0.00020	mg/L	2022-05-02	
Lithium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Magnesium, total	**1.01**	0.010	mg/L	2022-05-02	
Manganese, total	**0.0724**	0.00020	mg/L	2022-05-02	
Mercury, total	< 0.000010	0.000010	mg/L	2022-05-05	
Molybdenum, total	**0.00041**	0.00010	mg/L	2022-05-02	
Nickel, total	**0.00053**	0.00040	mg/L	2022-05-02	
Phosphorus, total	< 0.050	0.050	mg/L	2022-05-02	
Potassium, total	**0.59**	0.10	mg/L	2022-05-02	
Selenium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Silicon, total	**7.9**	1.0	mg/L	2022-05-02	
Silver, total	< 0.000050	0.000050	mg/L	2022-05-02	
Sodium, total	**4.05**	0.10	mg/L	2022-05-02	
Strontium, total	**0.0516**	0.0010	mg/L	2022-05-02	
Sulfur, total	< 3.0	3.0	mg/L	2022-05-02	
Tellurium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Thallium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Thorium, total	< 0.00010	0.00002	mg/L	2022-05-02	
Tin, total	< 0.00004	0.00020	mg/L	2022-05-02	
Titanium, total	< 0.0050	0.0050	mg/L	2022-05-02	
Tungsten, total	< 0.0002	0.0010	mg/L	2022-05-02	
Uranium, total	**0.000024**	0.000020	mg/L	2022-05-02	
Vanadium, total	< 0.0010	0.0050	mg/L	2022-05-02	
Zinc, total	< 0.0040	0.0040	mg/L	2022-05-02	
Zirconium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Furry Creek (22D3722-07) | Matrix: Water | Sampled: 2022-04-28					
****** DEFAULT GENERAL METHOD ******					
Abamectin	< 0.01	0.01	µg/g	2022-05-11	
Acephate	< 0.01	0.01	µg/g	2022-05-11	
Acetamiprid	< 0.01	0.01	µg/g	2022-05-11	
Acequinocyl	< 0.01	0.01	µg/g	2022-05-11	
Aldicarb	< 0.01	0.01	µg/g	2022-05-11	
Allethrin	< 0.01	0.01	µg/g	2022-05-11	
Azadirachtin	< 0.01	0.01	µg/g	2022-05-11	
Azoxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Benzovindiflupyr	< 0.01	0.01	µg/g	2022-05-11	
Bifenazate	< 0.01	0.01	µg/g	2022-05-11	
Bifenthrin	< 0.01	0.01	µg/g	2022-05-11	
Boscalid	< 0.01	0.01	µg/g	2022-05-11	
Buprofezin	< 0.01	0.01	µg/g	2022-05-11	
Carbaryl	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
Furry Creek (22D3722-07) | Matrix: Water | Sampled: 2022-04-28, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Carbofuran	< 0.01	0.01	µg/g	2022-05-11	
Chlorantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Chlorfenapyr	< 0.01	0.01	µg/g	2022-05-11	
Chlorpyrifos	< 0.01	0.01	µg/g	2022-05-11	
Clofentezine	< 0.01	0.01	µg/g	2022-05-11	
Clothianidin	< 0.01	0.01	µg/g	2022-05-11	
Coumaphos	< 0.01	0.01	µg/g	2022-05-11	
Cyantraniliprole	< 0.01	0.01	µg/g	2022-05-11	
Cyfluthrin (I, II, III, IV)	< 0.01	0.01	µg/g	2022-05-11	
Cypermethrin	< 0.02	0.02	µg/g	2022-05-11	
Cyprodinil	< 0.01	0.01	µg/g	2022-05-11	
Daminozide	< 0.02	0.02	µg/g	2022-05-11	
Deltamethrin	< 0.02	0.02	µg/g	2022-05-11	
Diazinon	< 0.01	0.01	µg/g	2022-05-11	
Dichlorvos	< 0.01	0.01	µg/g	2022-05-11	
Dimethoate	< 0.01	0.01	µg/g	2022-05-11	
Dimethomorph	< 0.01	0.01	µg/g	2022-05-11	
Dinotefuran	< 0.01	0.01	µg/g	2022-05-11	
Dodemorph	< 0.01	0.01	µg/g	2022-05-11	
Ethoprop	< 0.01	0.01	µg/g	2022-05-11	
Etofenprox	< 0.01	0.01	µg/g	2022-05-11	
Etoxazole	< 0.01	0.01	µg/g	2022-05-11	
Fenoxycarb	< 0.01	0.01	µg/g	2022-05-11	
Fenpyroximate	< 0.01	0.01	µg/g	2022-05-11	
Fensulfothion	< 0.01	0.01	µg/g	2022-05-11	
Fenthion	< 0.01	0.01	µg/g	2022-05-11	
Flonicamid	< 0.01	0.01	µg/g	2022-05-11	
Fluopyram	< 0.01	0.01	µg/g	2022-05-11	
Hexythiazox	< 0.01	0.01	µg/g	2022-05-11	
Imazalil	< 0.01	0.01	µg/g	2022-05-11	
Imidacloprid	< 0.01	0.01	µg/g	2022-05-11	
Iprodione	< 0.02	0.02	µg/g	2022-05-11	
Kinoprene	< 0.01	0.01	µg/g	2022-05-11	
Kresoxim-methyl	< 0.01	0.01	µg/g	2022-05-11	
Malathion	< 0.01	0.01	µg/g	2022-05-11	
Metalaxyl	< 0.01	0.01	µg/g	2022-05-11	
Methiocarb	< 0.01	0.01	µg/g	2022-05-11	
Methomyl	< 0.01	0.01	µg/g	2022-05-11	
Methoprene	< 0.01	0.01	µg/g	2022-05-11	
Methyl parathion	< 0.02	0.02	µg/g	2022-05-11	
Mevinphos	< 0.01	0.01	µg/g	2022-05-11	
MGK-264	< 0.01	0.01	µg/g	2022-05-11	
Myclobutanil	< 0.01	0.01	µg/g	2022-05-11	

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
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Analyte	Result	RL	Units	Analyzed	Qualifier
Furry Creek (22D3722-07) | Matrix: Water | Sampled: 2022-04-28, Continued					
****** DEFAULT GENERAL METHOD ***, Continued***					
Naled	< 0.01	0.01	µg/g	2022-05-11	
Novaluron	< 0.01	0.01	µg/g	2022-05-11	
Oxamyl	< 0.01	0.01	µg/g	2022-05-11	
Paclobutrazol	< 0.01	0.01	µg/g	2022-05-11	
Permethrin	< 0.02	0.02	µg/g	2022-05-11	
Phenothrin	< 0.01	0.01	µg/g	2022-05-11	
Phosmet	< 0.01	0.01	µg/g	2022-05-11	
Piperonyl butoxide	< 0.01	0.01	µg/g	2022-05-11	
Pirimicarb	< 0.01	0.01	µg/g	2022-05-11	
Prallethrin	< 0.01	0.01	µg/g	2022-05-11	
Propiconazole	< 0.01	0.01	µg/g	2022-05-11	
Propoxur	< 0.01	0.01	µg/g	2022-05-11	
Pyraclostrobin	< 0.01	0.01	µg/g	2022-05-11	
Pyrethrin	< 0.01	0.01	µg/g	2022-05-11	
Pyridaben	< 0.01	0.01	µg/g	2022-05-11	
Resmethrin	< 0.01	0.01	µg/g	2022-05-11	
Spinetoram	< 0.01	0.01	µg/g	2022-05-11	
Spinosad	< 0.01	0.01	µg/g	2022-05-11	
Spirodiclofen	< 0.01	0.01	µg/g	2022-05-11	
Spiromesifen	< 0.01	0.01	µg/g	2022-05-11	
Spirotetramat	< 0.01	0.01	µg/g	2022-05-11	
Spiroxamine	< 0.02	0.02	µg/g	2022-05-11	
Tebuconazole	< 0.01	0.01	µg/g	2022-05-11	
Tebufenozide	< 0.01	0.01	µg/g	2022-05-11	
Teflubenzuron	< 0.01	0.01	µg/g	2022-05-11	
Tetrachlorvinphos	< 0.01	0.01	µg/g	2022-05-11	
Tetramethrin	< 0.01	0.01	µg/g	2022-05-11	
Thiacloprid	< 0.01	0.01	µg/g	2022-05-11	
Thiamethoxam	< 0.01	0.01	µg/g	2022-05-11	
Thiophanate methyl	< 0.01	0.01	µg/g	2022-05-11	
Trifloxystrobin	< 0.01	0.01	µg/g	2022-05-11	
Anions					
Chloride	**0.26**	0.10	mg/L	2022-04-30	
Fluoride	< 0.10	0.10	mg/L	2022-04-30	
Nitrate (as N)	**0.054**	0.010	mg/L	2022-04-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2022-04-30	
Sulfate	**2.1**	1.0	mg/L	2022-04-30	
Calculated Parameters					
Hardness, Total (as CaCO3)	**8.01**	0.500	mg/L	N/A	
Solids, Total Dissolved	**11.1**	1.00	mg/L	N/A	
General Parameters					

TEST RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
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Analyte	Result	RL	Units	Analyzed	Qualifier
Furry Creek (22D3722-07) | Matrix: Water | Sampled: 2022-04-28, Continued					
General Parameters, Continued					
Alkalinity, Total (as CaCO3)	**7.2**	1.0	mg/L	2022-05-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Bicarbonate (as CaCO3)	**7.2**	1.0	mg/L	2022-05-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2022-05-03	
Conductivity (EC)	**20.1**	2.0	µS/cm	2022-05-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2022-04-30	
pH	**6.60**	0.10	pH units	2022-05-03	HT2
Turbidity	**0.13**	0.10	NTU	2022-05-02	HT1
Glycols					
Propylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Ethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Diethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Triethylene glycol	< 5.0	5.0	mg/L	2022-05-02	
Surrogate: Tetramethylene Glycol	*99*	*70-130*	%	*2022-05-02*	
Total Metals					
Aluminum, total	**0.0638**	0.0050	mg/L	2022-05-02	
Antimony, total	< 0.00020	0.00020	mg/L	2022-05-02	
Arsenic, total	< 0.00050	0.00050	mg/L	2022-05-02	
Barium, total	< 0.0050	0.0050	mg/L	2022-05-02	
Beryllium, total	< 0.00010	0.00010	mg/L	2022-05-02	
Bismuth, total	< 0.00010	0.00010	mg/L	2022-05-02	
Boron, total	< 0.0500	0.0500	mg/L	2022-05-02	
Cadmium, total	**0.000057**	0.000010	mg/L	2022-05-02	
Calcium, total	**2.74**	0.20	mg/L	2022-05-02	
Chromium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Cobalt, total	< 0.00010	0.00010	mg/L	2022-05-02	
Copper, total	**0.0106**	0.00040	mg/L	2022-05-02	
Iron, total	**0.015**	0.010	mg/L	2022-05-02	
Lead, total	< 0.00020	0.00020	mg/L	2022-05-02	
Lithium, total	**0.00010**	0.00010	mg/L	2022-05-02	
Magnesium, total	**0.280**	0.010	mg/L	2022-05-02	
Manganese, total	**0.00086**	0.00020	mg/L	2022-05-02	
Mercury, total	< 0.000010	0.000010	mg/L	2022-05-05	
Molybdenum, total	**0.00026**	0.00010	mg/L	2022-05-02	
Nickel, total	< 0.00040	0.00040	mg/L	2022-05-02	
Phosphorus, total	< 0.050	0.050	mg/L	2022-05-02	
Potassium, total	**0.17**	0.10	mg/L	2022-05-02	
Selenium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Silicon, total	**2.4**	1.0	mg/L	2022-05-02	
Silver, total	< 0.000050	0.000050	mg/L	2022-05-02	
Sodium, total	**0.92**	0.10	mg/L	2022-05-02	

TEST RESULTS

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Analyte	Result	RL	Units	Analyzed	Qualifier
Furry Creek (22D3722-07) | Matrix: Water | Sampled: 2022-04-28, Continued					
Total Metals, Continued					
Strontium, total	**0.0111**	0.0010	mg/L	2022-05-02	
Sulfur, total	< 3.0	3.0	mg/L	2022-05-02	
Tellurium, total	< 0.00050	0.00050	mg/L	2022-05-02	
Thallium, total	< 0.000020	0.000020	mg/L	2022-05-02	
Thorium, total	< 0.00010	0.00002	mg/L	2022-05-02	
Tin, total	**0.00004**	0.00020	mg/L	2022-05-02	
Titanium, total	< 0.0050	0.0050	mg/L	2022-05-02	
Tungsten, total	< 0.0002	0.0010	mg/L	2022-05-02	
Uranium, total	**0.000052**	0.000020	mg/L	2022-05-02	
Vanadium, total	< 0.0010	0.0050	mg/L	2022-05-02	
Zinc, total	**0.0058**	0.0040	mg/L	2022-05-02	
Zirconium, total	< 0.00010	0.00010	mg/L	2022-05-02	

Sample Qualifiers:

F2	The sample was not field-preserved with HNO3 and was therefore preserved in the laboratory and held for at least 16 hours prior to analysis for total metals.
HT1	The sample was prepared and/or analyzed past the recommended holding time.
HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
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Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Glycols in Water	EPA 8015B*	Gas Chromatography (GC-FID)	✓	Richmond
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	✓	N/A
Mercury, dissolved in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Pesticides in Water in Water	-	-		Burnaby
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2017)	SM 1030 E (2011)		N/A
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Turbidity in Water	SM 2130 B (2017)	Nephelometry	✓	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
µg/g	Micrograms per gram
µS/cm	Microsiemens per centimetre
ASTM	ASTM International Test Methods
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
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General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued or once samples expire, whichever comes first. Longer hold is possible if agreed to in writing.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline (s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
****** DEFAULT GENERAL METHOD ***, Batch B2E0378***										
Blank (B2E0378-BLK1)				Prepared: 2022-05-04, Analyzed: 2022-05-11						
Abamectin	< 0.01	0.01	µg/g							
Acephate	< 0.01	0.01	µg/g							
Acetamiprid	< 0.01	0.01	µg/g							
Acequinocyl	< 0.01	0.01	µg/g							
Aldicarb	< 0.01	0.01	µg/g							
Allethrin	< 0.01	0.01	µg/g							
Azadirachtin	< 0.01	0.01	µg/g							
Azoxystrobin	< 0.01	0.01	µg/g							
Benzovindiflupyr	< 0.01	0.01	µg/g							
Bifenazate	< 0.01	0.01	µg/g							
Bifenthrin	< 0.01	0.01	µg/g							
Boscalid	< 0.01	0.01	µg/g							
Buprofezin	< 0.01	0.01	µg/g							
Carbaryl	< 0.01	0.01	µg/g							
Carbofuran	< 0.01	0.01	µg/g							
Chlorantraniliprole	< 0.01	0.01	µg/g							
Chlorfenapyr	< 0.01	0.01	µg/g							
Chlorpyrifos	< 0.01	0.01	µg/g							
Clofentezine	< 0.01	0.01	µg/g							
Clothianidin	< 0.01	0.01	µg/g							
Coumaphos	< 0.01	0.01	µg/g							
Cyantraniliprole	< 0.01	0.01	µg/g							
Cyfluthrin (I, II, III, IV)	< 0.01	0.01	µg/g							
Cypermethrin	< 0.02	0.02	µg/g							
Cyprodinil	< 0.01	0.01	µg/g							
Daminozide	< 0.02	0.02	µg/g							
Deltamethrin	< 0.02	0.02	µg/g							
Diazinon	< 0.01	0.01	µg/g							
Dichlorvos	< 0.01	0.01	µg/g							
Dimethoate	< 0.01	0.01	µg/g							
Dimethomorph	< 0.01	0.01	µg/g							
Dinotefuran	< 0.01	0.01	µg/g							
Dodemorph	< 0.01	0.01	µg/g							
Ethoprop	< 0.01	0.01	µg/g							
Etofenprox	< 0.01	0.01	µg/g							
Etoxazole	< 0.01	0.01	µg/g							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Western Water Associates Ltd
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WORK ORDER 22D3722
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Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
****** DEFAULT GENERAL METHOD ***, Batch B2E0378, Continued***										
Blank (B2E0378-BLK1), Continued				Prepared: 2022-05-04, Analyzed: 2022-05-11						
Fenoxycarb	< 0.01	0.01	µg/g							
Fenpyroximate	< 0.01	0.01	µg/g							
Fensulfothion	< 0.01	0.01	µg/g							
Fenthion	< 0.01	0.01	µg/g							
Flonicamid	< 0.01	0.01	µg/g							
Fluopyram	< 0.01	0.01	µg/g							
Hexythiazox	< 0.01	0.01	µg/g							
Imazalil	< 0.01	0.01	µg/g							
Imidacloprid	< 0.01	0.01	µg/g							
Iprodione	< 0.02	0.02	µg/g							
Kinoprene	< 0.01	0.01	µg/g							
Kresoxim-methyl	< 0.01	0.01	µg/g							
Malathion	< 0.01	0.01	µg/g							
Metalaxyl	< 0.01	0.01	µg/g							
Methiocarb	< 0.01	0.01	µg/g							
Methomyl	< 0.01	0.01	µg/g							
Methoprene	< 0.01	0.01	µg/g							
Methyl parathion	< 0.02	0.02	µg/g							
Mevinphos	< 0.01	0.01	µg/g							
MGK-264	< 0.01	0.01	µg/g							
Myclobutanil	< 0.01	0.01	µg/g							
Naled	< 0.01	0.01	µg/g							
Novaluron	< 0.01	0.01	µg/g							
Oxamyl	< 0.01	0.01	µg/g							
Paclobutrazol	< 0.01	0.01	µg/g							
Permethrin	< 0.02	0.02	µg/g							
Phenothrin	< 0.01	0.01	µg/g							
Phosmet	< 0.01	0.01	µg/g							
Piperonyl butoxide	< 0.01	0.01	µg/g							
Pirimicarb	< 0.01	0.01	µg/g							
Prallethrin	< 0.01	0.01	µg/g							
Propiconazole	< 0.01	0.01	µg/g							
Propoxur	< 0.01	0.01	µg/g							
Pyraclostrobin	< 0.01	0.01	µg/g							
Pyrethrin	< 0.01	0.01	µg/g							
Pyridaben	< 0.01	0.01	µg/g							
Resmethrin	< 0.01	0.01	µg/g							
Spinetoram	< 0.01	0.01	µg/g							
Spinosad	< 0.01	0.01	µg/g							
Spirodiclofen	< 0.01	0.01	µg/g							
Spiromesifen	< 0.01	0.01	µg/g							
Spirotetramat	< 0.01	0.01	µg/g							
Spiroxamine	< 0.02	0.02	µg/g							
Tebuconazole	< 0.01	0.01	µg/g							
Tebufenozide	< 0.01	0.01	µg/g							
Teflubenzuron	< 0.01	0.01	µg/g							
Tetrachlorvinphos	< 0.01	0.01	µg/g							
Tetramethrin	< 0.01	0.01	µg/g							
Thiacloprid	< 0.01	0.01	µg/g							
Thiamethoxam	< 0.01	0.01	µg/g							
Thiophanate methyl	< 0.01	0.01	µg/g							
Trifloxystrobin	< 0.01	0.01	µg/g							
LCS (B2E0378-BS1)				Prepared: 2022-05-04, Analyzed: 2022-05-11						
Abamectin	0.06	0.01	µg/g	0.0606		91	70-130			
Acephate	0.06	0.01	µg/g	0.0606		99	70-130			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
****** DEFAULT GENERAL METHOD ***, Batch B2E0378, Continued***										
LCS (B2E0378-BS1), Continued					Prepared: 2022-05-04, Analyzed: 2022-05-11					
Acetamiprid	0.06	0.01	µg/g	0.0600		99	70-130			
Acequinocyl	0.05	0.01	µg/g	0.0593		89	70-130			
Aldicarb	0.06	0.01	µg/g	0.0606		101	70-130			
Allethrin	0.06	0.01	µg/g	0.0598		99	70-130			
Azadirachtin	0.05	0.01	µg/g	0.0600		86	70-130			
Azoxystrobin	0.06	0.01	µg/g	0.0594		105	70-130			
Benzovindiflupyr	0.06	0.01	µg/g	0.0600		101	70-130			
Bifenazate	0.06	0.01	µg/g	0.0598		101	70-130			
Bifenthrin	0.06	0.01	µg/g	0.0606		96	70-130			
Boscalid	0.06	0.01	µg/g	0.0600		100	70-130			
Buprofezin	0.06	0.01	µg/g	0.0596		99	70-130			
Carbaryl	0.06	0.01	µg/g	0.0600		103	70-130			
Carbofuran	0.06	0.01	µg/g	0.0606		101	70-130			
Chlorantraniliprole	0.06	0.01	µg/g	0.0612		96	70-130			
Chlorfenapyr	0.06	0.01	µg/g	0.0606		101	70-130			
Chlorpyrifos	0.06	0.01	µg/g	0.0606		102	70-130			
Clofentezine	0.06	0.01	µg/g	0.0606		102	70-130			
Clothianidin	0.06	0.01	µg/g	0.0600		97	70-130			
Coumaphos	0.06	0.01	µg/g	0.0600		102	70-130			
Cyantraniliprole	0.06	0.01	µg/g	0.0598		102	70-130			
Cyfluthrin (I, II, III, IV)	0.07	0.01	µg/g	0.0606		112	70-130			
Cypermethrin	0.06	0.02	µg/g	0.0600		98	70-130			
Cyprodinil	0.06	0.01	µg/g	0.0606		95	70-130			
Daminozide	0.07	0.02	µg/g	0.0606		123	70-130			
Deltamethrin	0.06	0.02	µg/g	0.0606		104	70-130			
Diazinon	0.06	0.01	µg/g	0.0606		101	70-130			
Dichlorvos	0.06	0.01	µg/g	0.0612		97	70-130			
Dimethoate	0.06	0.01	µg/g	0.0598		105	70-130			
Dimethomorph	0.06	0.01	µg/g	0.0594		104	70-130			
Dinotefuran	0.06	0.01	µg/g	0.0597		101	70-130			
Dodemorph	0.05	0.01	µg/g	0.0594		91	70-130			
Ethoprop	0.06	0.01	µg/g	0.0597		98	70-130			
Etofenprox	0.06	0.01	µg/g	0.0606		97	70-130			
Etoxazole	0.06	0.01	µg/g	0.0606		99	70-130			
Fenoxycarb	0.06	0.01	µg/g	0.0600		103	70-130			
Fenpyroximate	0.06	0.01	µg/g	0.0600		99	70-130			
Fensulfothion	0.06	0.01	µg/g	0.0597		103	70-130			
Fenthion	0.06	0.01	µg/g	0.0590		101	70-130			
Flonicamid	0.06	0.01	µg/g	0.0606		100	70-130			
Fluopyram	0.06	0.01	µg/g	0.0606		100	70-130			
Hexythiazox	0.06	0.01	µg/g	0.0606		95	70-130			
Imazalil	0.06	0.01	µg/g	0.0612		95	70-130			
Imidacloprid	0.06	0.01	µg/g	0.0606		102	70-130			
Iprodione	0.06	0.02	µg/g	0.0595		96	70-130			
Kinoprene	0.06	0.01	µg/g	0.0600		98	70-130			
Kresoxim-methyl	0.06	0.01	µg/g	0.0606		98	70-130			
Malathion	0.06	0.01	µg/g	0.0606		98	70-130			
Metalaxyl	0.06	0.01	µg/g	0.0598		99	70-130			
Methiocarb	0.06	0.01	µg/g	0.0600		100	70-130			
Methomyl	0.06	0.01	µg/g	0.0600		97	70-130			
Methoprene	0.06	0.01	µg/g	0.0600		104	70-130			
Methyl parathion	0.06	0.02	µg/g	0.0596		101	70-130			
Mevinphos	0.06	0.01	µg/g	0.0597		99	70-130			
MGK-264	0.06	0.01	µg/g	0.0606		104	70-130			
Myclobutanil	0.06	0.01	µg/g	0.0600		99	70-130			
Naled	0.01	0.01	µg/g	0.0606		18	70-130			SPK1

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
****** DEFAULT GENERAL METHOD ***, Batch B2E0378, Continued***										
LCS (B2E0378-BS1), Continued				Prepared: 2022-05-04, Analyzed: 2022-05-11						
Novaluron	0.05	0.01	µg/g	0.0606		90	70-130			
Oxamyl	0.06	0.01	µg/g	0.0612		96	70-130			
Paclobutrazol	0.06	0.01	µg/g	0.0600		98	70-130			
Permethrin	0.06	0.02	µg/g	0.0600		105	70-130			
Phenothrin	0.06	0.01	µg/g	0.0597		98	70-130			
Phosmet	0.06	0.01	µg/g	0.0600		98	70-130			
Piperonyl butoxide	0.06	0.01	µg/g	0.0599		101	70-130			
Pirimicarb	0.06	0.01	µg/g	0.0597		103	70-130			
Prallethrin	0.06	0.01	µg/g	0.0606		100	70-130			
Propiconazole	0.06	0.01	µg/g	0.0600		103	70-130			
Propoxur	0.05	0.01	µg/g	0.0600		84	70-130			
Pyraclostrobin	0.06	0.01	µg/g	0.0606		105	70-130			
Pyrethrin	0.11	0.01	µg/g	0.120		95	70-130			
Pyridaben	0.06	0.01	µg/g	0.0600		98	70-130			
Resmethrin	0.06	0.01	µg/g	0.0594		99	70-130			
Spinetoram	0.05	0.01	µg/g	0.0600		91	70-130			
Spinosad	0.05	0.01	µg/g	0.0596		89	70-130			
Spirodiclofen	0.05	0.01	µg/g	0.0600		91	70-130			
Spiromesifen	0.06	0.01	µg/g	0.0600		105	70-130			
Spirotetramat	0.06	0.01	µg/g	0.0606		93	70-130			
Spiroxamine	0.05	0.02	µg/g	0.0606		82	70-130			
Tebuconazole	0.06	0.01	µg/g	0.0600		100	70-130			
Tebufenozide	0.06	0.01	µg/g	0.0595		100	70-130			
Teflubenzuron	0.06	0.01	µg/g	0.0600		100	70-130			
Tetrachlorvinphos	0.06	0.01	µg/g	0.0606		103	70-130			
Tetramethrin	0.06	0.01	µg/g	0.0600		103	70-130			
Thiacloprid	0.06	0.01	µg/g	0.0600		100	70-130			
Thiamethoxam	0.06	0.01	µg/g	0.0606		98	70-130			
Thiophanate methyl	0.06	0.01	µg/g	0.0591		99	70-130			
Trifloxystrobin	0.06	0.01	µg/g	0.0606		100	70-130			
Anions, Batch B2D3038										
Blank (B2D3038-BLK1)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B2D3038-BLK2)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B2D3038-BS1)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Chloride	16.1	0.10	mg/L	16.0		101	90-110			
Fluoride	4.01	0.10	mg/L	4.00		100	88-108			
Nitrate (as N)	4.06	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	2.15	0.010	mg/L	2.00		108	85-115			
Sulfate	16.4	1.0	mg/L	16.0		103	90-110			
LCS (B2D3038-BS2)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Chloride	16.2	0.10	mg/L	16.0		102	90-110			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B2D3038, Continued										
LCS (B2D3038-BS2), Continued				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Fluoride	4.02	0.10	mg/L	4.00		100	88-108			
Nitrate (as N)	4.02	0.010	mg/L	4.00		100	90-110			
Nitrite (as N)	1.96	0.010	mg/L	2.00		98	85-115			
Sulfate	15.9	1.0	mg/L	16.0		99	90-110			
Dissolved Metals, Batch B2E0018										
Blank (B2E0018-BLK1)				Prepared: 2022-05-01, Analyzed: 2022-05-01						
Aluminum, dissolved	< 0.0050	0.0050	mg/L							
Antimony, dissolved	< 0.00020	0.00020	mg/L							
Arsenic, dissolved	< 0.00050	0.00050	mg/L							
Barium, dissolved	< 0.0050	0.0050	mg/L							
Beryllium, dissolved	< 0.00010	0.00010	mg/L							
Bismuth, dissolved	< 0.00010	0.00010	mg/L							
Boron, dissolved	< 0.0500	0.0500	mg/L							
Cadmium, dissolved	< 0.000010	0.000010	mg/L							
Calcium, dissolved	< 0.20	0.20	mg/L							
Chromium, dissolved	< 0.00050	0.00050	mg/L							
Cobalt, dissolved	< 0.00010	0.00010	mg/L							
Copper, dissolved	< 0.00040	0.00040	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.00020	0.00020	mg/L							
Lithium, dissolved	< 0.00002	0.00002	mg/L							
Magnesium, dissolved	< 0.010	0.010	mg/L							
Manganese, dissolved	< 0.00020	0.00020	mg/L							
Molybdenum, dissolved	< 0.00010	0.00010	mg/L							
Nickel, dissolved	< 0.00040	0.00040	mg/L							
Phosphorus, dissolved	< 0.050	0.050	mg/L							
Potassium, dissolved	< 0.10	0.10	mg/L							
Selenium, dissolved	< 0.00050	0.00050	mg/L							
Silicon, dissolved	< 1.0	1.0	mg/L							
Silver, dissolved	< 0.000050	0.000050	mg/L							
Sodium, dissolved	< 0.10	0.10	mg/L							
Strontium, dissolved	< 0.0010	0.0010	mg/L							
Sulfur, dissolved	< 3.0	3.0	mg/L							
Tellurium, dissolved	< 0.00050	0.00050	mg/L							
Thallium, dissolved	< 0.000020	0.000020	mg/L							
Thorium, dissolved	< 0.00010	0.00010	mg/L							
Tin, dissolved	< 0.00020	0.00020	mg/L							
Titanium, dissolved	< 0.0050	0.0050	mg/L							
Tungsten, dissolved	< 0.0010	0.0010	mg/L							
Uranium, dissolved	< 0.000020	0.000020	mg/L							
Vanadium, dissolved	< 0.0010	0.0010	mg/L							
Zinc, dissolved	< 0.0040	0.0040	mg/L							
Zirconium, dissolved	< 0.00010	0.00010	mg/L							
LCS (B2E0018-BS1)				Prepared: 2022-05-01, Analyzed: 2022-05-01						
Aluminum, dissolved	0.0217	0.0050	mg/L	0.0200		108	80-120			
Antimony, dissolved	0.0152	0.00020	mg/L	0.0200		76	80-120			SPK1
Arsenic, dissolved	0.0200	0.00050	mg/L	0.0200		100	80-120			
Barium, dissolved	0.0189	0.0050	mg/L	0.0200		94	80-120			
Beryllium, dissolved	0.0187	0.00010	mg/L	0.0200		94	80-120			
Bismuth, dissolved	0.0184	0.00010	mg/L	0.0200		92	80-120			
Boron, dissolved	< 0.0500	0.0500	mg/L	0.0200		114	80-120			
Cadmium, dissolved	0.0182	0.000010	mg/L	0.0200		91	80-120			
Calcium, dissolved	1.83	0.20	mg/L	2.00		91	80-120			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B2E0018, Continued										
LCS (B2E0018-BS1), Continued				Prepared: 2022-05-01, Analyzed: 2022-05-01						
Chromium, dissolved	0.0197	0.00050	mg/L	0.0200		98	80-120			
Cobalt, dissolved	0.0199	0.00010	mg/L	0.0200		99	80-120			
Copper, dissolved	0.0197	0.00040	mg/L	0.0200		98	80-120			
Iron, dissolved	1.99	0.010	mg/L	2.00		100	80-120			
Lead, dissolved	0.0179	0.00020	mg/L	0.0200		89	80-120			
Lithium, dissolved	0.0190	0.00002	mg/L	0.0200		95	80-120			
Magnesium, dissolved	2.02	0.010	mg/L	2.00		101	80-120			
Manganese, dissolved	0.0198	0.00020	mg/L	0.0200		99	80-120			
Molybdenum, dissolved	0.0166	0.00010	mg/L	0.0200		83	80-120			
Nickel, dissolved	0.0201	0.00040	mg/L	0.0200		101	80-120			
Phosphorus, dissolved	1.97	0.050	mg/L	2.00		99	80-120			
Potassium, dissolved	1.96	0.10	mg/L	2.00		98	80-120			
Selenium, dissolved	0.0179	0.00050	mg/L	0.0200		89	80-120			
Silicon, dissolved	1.8	1.0	mg/L	2.00		89	80-120			
Silver, dissolved	0.0184	0.000050	mg/L	0.0200		92	80-120			
Sodium, dissolved	2.11	0.10	mg/L	2.00		105	80-120			
Strontium, dissolved	0.0192	0.0010	mg/L	0.0200		96	80-120			
Sulfur, dissolved	4.5	3.0	mg/L	5.00		90	80-120			
Tellurium, dissolved	0.0187	0.00050	mg/L	0.0200		93	80-120			
Thallium, dissolved	0.0184	0.000020	mg/L	0.0200		92	80-120			
Thorium, dissolved	0.0186	0.00010	mg/L	0.0200		93	80-120			
Tin, dissolved	0.0167	0.00020	mg/L	0.0200		84	80-120			
Titanium, dissolved	0.0172	0.0050	mg/L	0.0200		86	80-120			
Tungsten, dissolved	0.0160	0.0010	mg/L	0.0200		80	80-120			
Uranium, dissolved	0.0185	0.000020	mg/L	0.0200		92	80-120			
Vanadium, dissolved	0.0198	0.0010	mg/L	0.0200		99	80-120			
Zinc, dissolved	0.0212	0.0040	mg/L	0.0200		106	80-120			
Zirconium, dissolved	0.0172	0.00010	mg/L	0.0200		86	80-120			
Reference (B2E0018-SRM1)				Prepared: 2022-05-01, Analyzed: 2022-05-01						
Aluminum, dissolved	0.253	0.0050	mg/L	0.235		107	70-130			
Antimony, dissolved	0.0430	0.00020	mg/L	0.0431		100	70-130			
Arsenic, dissolved	0.463	0.00050	mg/L	0.423		110	70-130			
Barium, dissolved	3.39	0.0050	mg/L	3.30		103	70-130			
Beryllium, dissolved	0.207	0.00010	mg/L	0.209		99	70-130			
Boron, dissolved	1.70	0.0500	mg/L	1.65		103	70-130			
Cadmium, dissolved	0.213	0.000010	mg/L	0.221		97	70-130			
Calcium, dissolved	7.61	0.20	mg/L	7.72		99	70-130			
Chromium, dissolved	0.436	0.00050	mg/L	0.434		101	70-130			
Cobalt, dissolved	0.130	0.00010	mg/L	0.124		105	70-130			
Copper, dissolved	0.830	0.00040	mg/L	0.815		102	70-130			
Iron, dissolved	1.28	0.010	mg/L	1.27		101	70-130			
Lead, dissolved	0.104	0.00020	mg/L	0.110		94	70-130			
Lithium, dissolved	0.101	0.00010	mg/L	0.100		101	70-130			
Magnesium, dissolved	6.84	0.010	mg/L	6.59		104	70-130			
Manganese, dissolved	0.347	0.00020	mg/L	0.342		101	70-130			
Molybdenum, dissolved	0.386	0.00010	mg/L	0.404		96	70-130			
Nickel, dissolved	0.876	0.00040	mg/L	0.835		105	70-130			
Phosphorus, dissolved	0.538	0.050	mg/L	0.499		108	70-130			
Potassium, dissolved	3.14	0.10	mg/L	2.88		109	70-130			
Selenium, dissolved	0.0321	0.00050	mg/L	0.0324		99	70-130			
Sodium, dissolved	20.5	0.10	mg/L	18.0		114	70-130			
Strontium, dissolved	0.923	0.0010	mg/L	0.935		99	70-130			
Thallium, dissolved	0.0379	0.000020	mg/L	0.0385		98	70-130			
Uranium, dissolved	0.240	0.000020	mg/L	0.258		93	70-130			
Vanadium, dissolved	0.890	0.0050	mg/L	0.873		102	70-130			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B2E0018, Continued										
Reference (B2E0018-SRM1), Continued				Prepared: 2022-05-01, Analyzed: 2022-05-01						
Zinc, dissolved	0.880	0.0040	mg/L	0.848		104	70-130			
Dissolved Metals, Batch B2E0265										
Blank (B2E0265-BLK1)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, dissolved	< 0.000010	0.000010	mg/L							
Blank (B2E0265-BLK2)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, dissolved	< 0.000010	0.000010	mg/L							
Blank (B2E0265-BLK3)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, dissolved	< 0.000010	0.000010	mg/L							
Blank (B2E0265-BLK4)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, dissolved	< 0.000010	0.000010	mg/L							
Reference (B2E0265-SRM1)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, dissolved	0.000243	0.000010	mg/L	0.000250		97	70-130			
Reference (B2E0265-SRM2)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, dissolved	0.000235	0.000010	mg/L	0.000250		94	70-130			
Reference (B2E0265-SRM3)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, dissolved	0.000243	0.000010	mg/L	0.000250		97	70-130			
Reference (B2E0265-SRM4)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, dissolved	0.000249	0.000010	mg/L	0.000250		100	70-130			
General Parameters, Batch B2D3050										
Blank (B2D3050-BLK1)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Cyanide, Total	< 0.0020	0.0020	mg/L							
Blank (B2D3050-BLK2)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Cyanide, Total	< 0.0020	0.0020	mg/L							
LCS (B2D3050-BS1)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Cyanide, Total	0.0215	0.0020	mg/L	0.0200		108	82-120			
LCS (B2D3050-BS2)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Cyanide, Total	0.0216	0.0020	mg/L	0.0200		108	82-120			
LCS Dup (B2D3050-BSD1)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Cyanide, Total	0.0211	0.0020	mg/L	0.0200		106	82-120	2	10	
LCS Dup (B2D3050-BSD2)				Prepared: 2022-04-30, Analyzed: 2022-04-30						
Cyanide, Total	0.0211	0.0020	mg/L	0.0200		106	82-120	2	10	
General Parameters, Batch B2E0179										
Blank (B2E0179-BLK1)				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Turbidity	< 0.10	0.10	NTU							HT1
LCS (B2E0179-BS1)				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Turbidity	38.8	0.10	NTU	40.0		97	90-110			HT1

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B2E0202										
Blank (B2E0202-BLK1)				Prepared: 2022-05-03, Analyzed: 2022-05-03						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Conductivity (EC)	< 2.0	2.0	µS/cm							
Blank (B2E0202-BLK2)				Prepared: 2022-05-03, Analyzed: 2022-05-03						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Conductivity (EC)	< 2.0	2.0	µS/cm							
LCS (B2E0202-BS1)				Prepared: 2022-05-03, Analyzed: 2022-05-03						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
LCS (B2E0202-BS2)				Prepared: 2022-05-03, Analyzed: 2022-05-03						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
LCS (B2E0202-BS3)				Prepared: 2022-05-03, Analyzed: 2022-05-03						
Conductivity (EC)	1400	2.0	µS/cm	1410		100	95-105			
LCS (B2E0202-BS4)				Prepared: 2022-05-03, Analyzed: 2022-05-03						
Conductivity (EC)	1420	2.0	µS/cm	1410		100	95-105			
Reference (B2E0202-SRM1)				Prepared: 2022-05-03, Analyzed: 2022-05-03						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B2E0202-SRM2)				Prepared: 2022-05-03, Analyzed: 2022-05-03						
pH	7.00	0.10	pH units	7.01		100	98-102			
Glycols, Batch B2E0114										
Blank (B2E0114-BLK1)				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Propylene glycol	< 5.0	5.0	mg/L							
Ethylene glycol	< 5.0	5.0	mg/L							
Diethylene glycol	< 5.0	5.0	mg/L							
Triethylene glycol	< 5.0	5.0	mg/L							
Surrogate: Tetramethylene Glycol	*93.3*		*mg/L*	108		*86*	*70-130*			
LCS (B2E0114-BS1)				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Propylene glycol	43.4	5.0	mg/L	49.6		88	70-130			
Ethylene glycol	44.3	5.0	mg/L	52.5		84	70-130			
Diethylene glycol	46.9	5.0	mg/L	52.5		89	70-130			
Triethylene glycol	51.2	5.0	mg/L	50.5		101	70-130			
Surrogate: Tetramethylene Glycol	*98.3*		*mg/L*	108		*91*	*70-130*			
LCS Dup (B2E0114-BSD1)				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Propylene glycol	45.0	5.0	mg/L	49.6		91	70-130	4	20	
Ethylene glycol	53.6	5.0	mg/L	52.5		102	70-130	19	20	
Diethylene glycol	47.4	5.0	mg/L	52.5		90	70-130	1	20	
Triethylene glycol	48.7	5.0	mg/L	50.5		96	70-130	5	20	
Surrogate: Tetramethylene Glycol	*105*		*mg/L*	108		*97*	*70-130*			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B2E0041										
Blank (B2E0041-BLK1)				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Aluminum, total	< 0.0050	0.0050	mg/L							
Antimony, total	< 0.00020	0.00020	mg/L							
Arsenic, total	< 0.00050	0.00050	mg/L							
Barium, total	< 0.0050	0.0050	mg/L							
Beryllium, total	< 0.00010	0.00010	mg/L							
Bismuth, total	< 0.00010	0.00010	mg/L							
Boron, total	< 0.0500	0.0500	mg/L							
Cadmium, total	< 0.000010	0.000010	mg/L							
Calcium, total	< 0.20	0.20	mg/L							
Chromium, total	< 0.00050	0.00050	mg/L							
Cobalt, total	< 0.00010	0.00010	mg/L							
Copper, total	< 0.00040	0.00040	mg/L							
Iron, total	< 0.010	0.010	mg/L							
Lead, total	< 0.00020	0.00020	mg/L							
Lithium, total	< 0.00010	0.00010	mg/L							
Magnesium, total	< 0.010	0.010	mg/L							
Manganese, total	< 0.00020	0.00020	mg/L							
Molybdenum, total	< 0.00010	0.00010	mg/L							
Nickel, total	< 0.00040	0.00040	mg/L							
Phosphorus, total	< 0.050	0.050	mg/L							
Potassium, total	< 0.10	0.10	mg/L							
Selenium, total	< 0.00050	0.00050	mg/L							
Silicon, total	< 1.0	1.0	mg/L							
Silver, total	< 0.000050	0.000050	mg/L							
Sodium, total	< 0.10	0.10	mg/L							
Strontium, total	< 0.0010	0.0010	mg/L							
Sulfur, total	< 3.0	3.0	mg/L							
Tellurium, total	< 0.00050	0.00050	mg/L							
Thallium, total	< 0.000020	0.000020	mg/L							
Thorium, total	< 0.00010	0.00010	mg/L							
Tin, total	< 0.00004	0.00004	mg/L							
Titanium, total	< 0.0050	0.0050	mg/L							
Tungsten, total	< 0.0002	0.0002	mg/L							
Uranium, total	< 0.000020	0.000020	mg/L							
Vanadium, total	< 0.0010	0.0010	mg/L							
Zinc, total	< 0.0040	0.0040	mg/L							
Zirconium, total	< 0.00010	0.00010	mg/L							
LCS (B2E0041-BS1)				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Aluminum, total	0.0222	0.0050	mg/L	0.0200		111	80-120			
Antimony, total	0.0194	0.00020	mg/L	0.0200		97	80-120			
Arsenic, total	0.0196	0.00050	mg/L	0.0200		98	80-120			
Barium, total	0.0196	0.0050	mg/L	0.0200		98	80-120			
Beryllium, total	0.0197	0.00010	mg/L	0.0200		99	80-120			
Bismuth, total	0.0205	0.00010	mg/L	0.0200		102	80-120			
Boron, total	< 0.0500	0.0500	mg/L	0.0200		102	80-120			
Cadmium, total	0.0196	0.000010	mg/L	0.0200		98	80-120			
Calcium, total	1.93	0.20	mg/L	2.00		96	80-120			
Chromium, total	0.0197	0.00050	mg/L	0.0200		98	80-120			
Cobalt, total	0.0195	0.00010	mg/L	0.0200		98	80-120			
Copper, total	0.0196	0.00040	mg/L	0.0200		98	80-120			
Iron, total	1.97	0.010	mg/L	2.00		99	80-120			
Lead, total	0.0206	0.00020	mg/L	0.0200		103	80-120			
Lithium, total	0.0198	0.00010	mg/L	0.0200		99	80-120			
Magnesium, total	1.97	0.010	mg/L	2.00		98	80-120			
Manganese, total	0.0196	0.00020	mg/L	0.0200		98	80-120			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B2E0041, Continued										
LCS (B2E0041-BS1), Continued				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Molybdenum, total	0.0192	0.00010	mg/L	0.0200		96	80-120			
Nickel, total	0.0193	0.00040	mg/L	0.0200		97	80-120			
Phosphorus, total	2.00	0.050	mg/L	2.00		100	80-120			
Potassium, total	1.90	0.10	mg/L	2.00		95	80-120			
Selenium, total	0.0202	0.00050	mg/L	0.0200		101	80-120			
Silicon, total	2.0	1.0	mg/L	2.00		102	80-120			
Silver, total	0.0196	0.000050	mg/L	0.0200		98	80-120			
Sodium, total	1.98	0.10	mg/L	2.00		99	80-120			
Strontium, total	0.0194	0.0010	mg/L	0.0200		97	80-120			
Sulfur, total	5.3	3.0	mg/L	5.00		106	80-120			
Tellurium, total	0.0200	0.00050	mg/L	0.0200		100	80-120			
Thallium, total	0.0205	0.000020	mg/L	0.0200		102	80-120			
Thorium, total	0.0204	0.00010	mg/L	0.0200		102	80-120			
Tin, total	0.0197	0.00004	mg/L	0.0200		99	80-120			
Titanium, total	0.0192	0.0050	mg/L	0.0200		96	80-120			
Tungsten, total	0.0193	0.0002	mg/L	0.0200		96	80-120			
Uranium, total	0.0204	0.000020	mg/L	0.0200		102	80-120			
Vanadium, total	0.0196	0.0010	mg/L	0.0200		98	80-120			
Zinc, total	0.0192	0.0040	mg/L	0.0200		96	80-120			
Zirconium, total	0.0201	0.00010	mg/L	0.0200		101	80-120			
Duplicate (B2E0041-DUP1)				**Source: 22D3722-07**	Prepared: 2022-05-02, Analyzed: 2022-05-02					
Aluminum, total	0.0622	0.0050	mg/L		0.0638			3	20	
Antimony, total	< 0.00020	0.00020	mg/L		< 0.00020				20	
Arsenic, total	< 0.00050	0.00050	mg/L		< 0.00050				20	
Barium, total	< 0.0050	0.0050	mg/L		< 0.0050				20	
Beryllium, total	< 0.00010	0.00010	mg/L		< 0.00010				20	
Bismuth, total	< 0.00010	0.00010	mg/L		< 0.00010				20	
Boron, total	< 0.0500	0.0500	mg/L		< 0.0500				20	
Cadmium, total	0.000052	0.000010	mg/L		0.000057			8	20	
Calcium, total	2.78	0.20	mg/L		2.74			1	20	
Chromium, total	< 0.00050	0.00050	mg/L		< 0.00050				20	
Cobalt, total	< 0.00010	0.00010	mg/L		< 0.00010				20	
Copper, total	0.0107	0.00040	mg/L		0.0106			1	20	
Iron, total	0.017	0.010	mg/L		0.015				20	
Lead, total	< 0.00020	0.00020	mg/L		< 0.00020				20	
Lithium, total	0.00010	0.00010	mg/L		0.00010				20	
Magnesium, total	0.288	0.010	mg/L		0.280			3	20	
Manganese, total	0.00088	0.00020	mg/L		0.00086				20	
Molybdenum, total	0.00027	0.00010	mg/L		0.00026				20	
Nickel, total	< 0.00040	0.00040	mg/L		< 0.00040				20	
Phosphorus, total	< 0.050	0.050	mg/L		< 0.050				20	
Potassium, total	0.17	0.10	mg/L		0.17				20	
Selenium, total	< 0.00050	0.00050	mg/L		< 0.00050				20	
Silicon, total	2.5	1.0	mg/L		2.4				20	
Silver, total	< 0.000050	0.000050	mg/L		< 0.000050				20	
Sodium, total	0.93	0.10	mg/L		0.92			2	20	
Strontium, total	0.0114	0.0010	mg/L		0.0111			3	20	
Sulfur, total	< 3.0	3.0	mg/L		< 3.0				20	
Tellurium, total	< 0.00050	0.00050	mg/L		< 0.00050				20	
Thallium, total	< 0.000020	0.000020	mg/L		< 0.000020				20	
Thorium, total	< 0.00010	0.00002	mg/L		< 0.00010				20	
Tin, total	0.00006	0.00020	mg/L		0.00004				20	
Titanium, total	< 0.0050	0.0050	mg/L		< 0.0050				20	
Tungsten, total	< 0.0002	0.0010	mg/L		< 0.0002				20	
Uranium, total	0.000054	0.000020	mg/L		0.000052				20	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	22D3722
PROJECT	21452	**REPORTED**	2022-05-11 16:32

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B2E0041, Continued										
Duplicate (B2E0041-DUP1), Continued		**Source: 22D3722-07**		Prepared: 2022-05-02, Analyzed: 2022-05-02						
Vanadium, total	< 0.0010	0.0050	mg/L		< 0.0010				20	
Zinc, total	0.0065	0.0040	mg/L		0.0058				20	
Zirconium, total	< 0.00010	0.00010	mg/L		< 0.00010				20	
Reference (B2E0041-SRM1)				Prepared: 2022-05-02, Analyzed: 2022-05-02						
Aluminum, total	0.212	0.0050	mg/L	0.198		107	70-130			
Antimony, total	0.0233	0.00020	mg/L	0.0230		101	70-130			
Arsenic, total	0.0211	0.00050	mg/L	0.0200		106	70-130			
Barium, total	0.0163	0.0050	mg/L	0.0161		101	70-130			
Beryllium, total	0.00400	0.00010	mg/L	0.00384		104	70-130			
Boron, total	0.191	0.0500	mg/L	0.191		100	70-130			
Cadmium, total	0.00400	0.000010	mg/L	0.00404		99	70-130			
Calcium, total	0.95	0.20	mg/L	0.938		101	70-130			
Chromium, total	0.0267	0.00050	mg/L	0.0256		104	70-130			
Cobalt, total	0.0226	0.00010	mg/L	0.0214		105	70-130			
Copper, total	0.0341	0.00040	mg/L	0.0322		106	70-130			
Iron, total	0.060	0.010	mg/L	0.0580		104	70-130			
Lead, total	0.00845	0.00020	mg/L	0.00796		106	70-130			
Lithium, total	0.0103	0.00010	mg/L	0.0102		101	70-130			
Magnesium, total	0.104	0.010	mg/L	0.112		93	70-130			
Manganese, total	0.0121	0.00020	mg/L	0.0120		101	70-130			
Molybdenum, total	0.0443	0.00010	mg/L	0.0438		101	70-130			
Nickel, total	0.0410	0.00040	mg/L	0.0394		104	70-130			
Potassium, total	0.79	0.10	mg/L	0.820		97	70-130			
Selenium, total	0.125	0.00050	mg/L	0.117		107	70-130			
Sodium, total	0.59	0.10	mg/L	0.490		120	70-130			
Strontium, total	0.283	0.0010	mg/L	0.276		103	70-130			
Thallium, total	0.0125	0.000020	mg/L	0.0118		106	70-130			
Uranium, total	0.00999	0.000020	mg/L	0.00970		103	70-130			
Vanadium, total	0.0291	0.0050	mg/L	0.0274		106	70-130			
Zinc, total	0.0911	0.0040	mg/L	0.0884		103	70-130			
Total Metals, Batch B2E0266										
Blank (B2E0266-BLK1)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, total	< 0.000010	0.000010	mg/L							
Blank (B2E0266-BLK2)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, total	< 0.000010	0.000010	mg/L							
Matrix Spike (B2E0266-MS1)		**Source: 22D3722-03**		Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, total	0.000525	0.000020	mg/L	0.000500	< 0.000010	105	70-130			
Reference (B2E0266-SRM1)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, total	0.000254	0.000010	mg/L	0.000250		101	70-130			
Reference (B2E0266-SRM2)				Prepared: 2022-05-03, Analyzed: 2022-05-04						
Mercury, total	0.000259	0.000010	mg/L	0.000250		104	70-130			

QC Qualifiers:

HT1 The sample was prepared and/or analyzed past the recommended holding time.

SPK1 The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.

CARO ANALYTICAL SERVICES
Caring About Results, Obviously.

CARO.ca **1-888-311-8846**
#110-4011 Viking Way, Richmond, BC V6V 2K9
#102-3677 Highway 97N, Kelowna, BC V1X 5C3
17225 109 Avenue NW, Edmonton, AB T5S 1H7
#108-4475 Wayburne Drive, Burnaby, BC V5G 4X4

CARO BC COC, Rev 2019-01

CHAIN OF CUSTODY RECORD

COC# B107311 PAGE OF

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
MC Mackenzie Commun	TIME: 0930		TIME:

TURNAROUND TIME REQUESTED:
Routine: (5-7 Days) ☒
Rush: 1 Day* ☐ 2 Day* ☐ 3 Day* ☐
Other* ____
*Contact Lab To Confirm. Surcharge May Apply

REGULATORY APPLICATION: Show on Report ☐
Canadian Drinking Water Quality ☐ BC WQG ☐ BC HWR ☐
BC CSR Soil: WL ☐ AL ☐ PL ☐ RL-LD ☐ RL-HD ☐ CL ☐ IL ☐
BC CSR Water: AW ☐ IW ☐ LW ☐ DW ☐
CCME: ____ Other: ____

REPORT TO:
COMPANY: Western Water
ADDRESS: #301-1095 McKenzie Ave Victoria, BC
CONTACT: Tim Sival
TEL/FAX: ____
DELIVERY METHOD: EMAIL ☒ MAIL ☐ OTHER* ☐
DATA FORMAT: EXCEL ☐ WATERTRAX ☐ ESdat ☐ EQuIS ☐ BC EMS ☐ OTHER* ☐
Copy of COC with Report ☐
EMAIL 1: tim@westernwater.ca
EMAIL 2: ____

INVOICE TO: SAME AS REPORT TO ☐
COMPANY: Thurber Engineering
ADDRESS: ____
CONTACT: ____
TEL: ____
DELIVERY METHOD: EMAIL ☒ MAIL ☐ OTHER* ☐
EMAIL 1: ap@thurber.ca
EMAIL 2: ____
QUOTE ID: ____
PO #: 21452

PROJECT NUMBER / INFO: 21452

A: Biohazard B: Cyanide C: PCBs D: Asbestos E: Heavy Metals F: Flammable G: Strong Odour H: High Contamination I: Other (please specify*)

** If you would like to sign up for ClientConnect, CARO's online service offerings, please check here: ☐

SAMPLED BY: ASH/MCC

CLIENT SAMPLE ID:	MATRIX: DRINKING WATER	OTHER WATER	SOIL	OTHER	CONTAINER QTY	SAMPLING: DATE YYYY-MM-DD	TIME HH:MM	COMMENTS: CHLORINATED	FILTERED	PRESERVED	(e.g. flow/volume, media ID, Upload ID, notes)
TW06-04	X				8	2022-04-27			X		
P1						2022-04-27					
WPN 51052						2022-04-27					
MIS						2022-04-28					
TW06-03						2022-04-28					
MW22-A						2022-04-27					
Furry Creek	X				8	2022-04-28					

ANALYSES REQUESTED:

CLIENT SAMPLE ID:	BTEX ☐ VPH ☐ PHC F1 ☐	VOC ☐ VPH ☐	EPH ☐ PHC F2-F4 ☐	PAH ☐ L/HEPH ☐	PHENOLS Chlorinated ☐ Non-Chlor. ☐	PCB ☐ GLYCOLS ☒ HAA ☐ THM ☐	PESTICIDES ☐ ACID HERBICIDES ☐	METALS - WATER TOTAL Hg ☒	METALS - WATER DISSOLVED Hg ☒	METALS - SOIL (SALM) ☐ inc. pH ☐	pH ☐ EC ☐ ALK ☐ ANIONS ☐	TSS ☐ VSS ☐ TDS ☐	BOD ☐ COD ☐ TOG ☐ MOG ☐	TN ☐ NH3 ☐ TKN ☐	FECAL COLIFORMS ☐ HPC ☐	TOTAL COLIFORMS ☐ *E. coli* ☐	ESSENTIAL DRINKING WATER PACKAGE	ASBESTOS	Cannabis Package by LDMS	Potability, Chem Pkg 1					HOLD	POSSIBLE SAMPLE HAZARD CODE(S)
TW06-04						X			X										X	X					
P1								X																	
WPN 51052																									
MIS																									
TW06-03																									
MW22-A																									
Furry Creek						X		X											X	X					

SHIPPING INSTRUCTIONS: Return Cooler(s) ☐
Supplies Needed:

SAMPLE RETENTION:
30 Days (default) ☐
60 Days ☐ 90 Days ☐
Other (surcharges may apply): ____

*** OTHER INSTRUCTIONS:**

If you would like to talk to a real live Scientist about your project requirements, please check here: ☐

SAMPLE RECEIPT CONDITION:
COOLER 1 (°C): ____ ICE: Y ☐ N ☐
COOLER 2 (°C): ____ ICE: Y ☐ N ☐
COOLER 3 (°C): ____ ICE: Y ☐ N ☐
CUSTODY SEALS INTACT: NA ☐ Y ☐ N ☐

Groundwater Supply Development and Management

Source Water Assessment and Protection

Well Monitoring & Maintenance

Environmental & Water Quality Monitoring

Storm & Wastewater Disposal to Ground

Groundwater Modeling

Aquifer Test Design and Analysis

Geothermal / Geoexchange Systems

Policy and Guideline Development

Applied Research

Rural Subdivision Services

Environmental Assessment & Permitting

| #301 - 1095 McKenzie Ave, Victoria, B.C. V8P 2L5 | P:1.250.704.4428 | Vernon | Prince George | www.westernwater.ca |

Groundwater Supply Development and Management

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