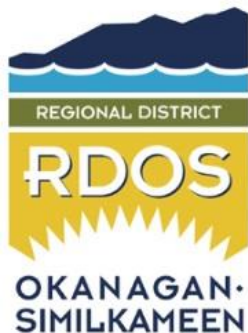


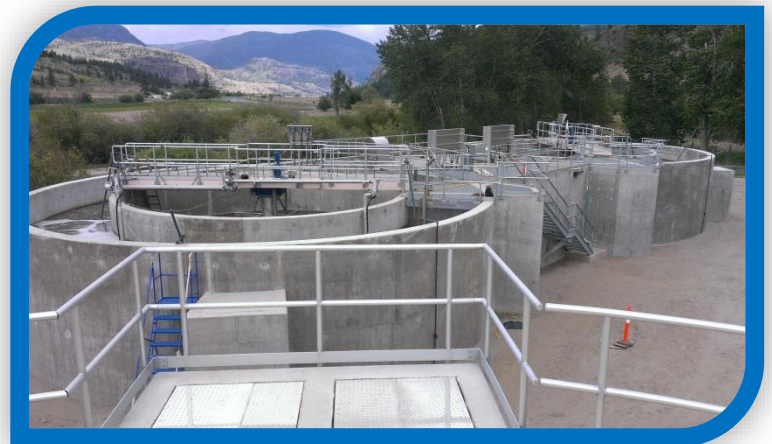
2021 Operations and Monitoring Report Okanagan Falls Wastewater Treatment Facility and Polishing Wetland Okanagan Falls B.C.

Prepared by:

**Regional District of
Okanagan - Similkameen
101 Martin Street
Penticton, B.C. V2A 5J9**



April 2022



EXECUTIVE SUMMARY

The Regional District of Okanagan-Similkameen is pleased to provide this report in conjunction with Larratt Aquatic for the Okanagan Falls Wastewater Treatment Facility (WWTF) located on Rail Road. All 2021 monitoring data and related data analysis by associated qualified professionals have been included in this report.

The Biological Nutrient Removal wastewater treatment facility and polishing wetland is located on Rail Road south of the community of Okanagan Falls. The Wastewater Treatment Facility has been in operation since 2013, while the polishing wetland began receiving effluent in the spring of 2021. Amendments made to Operational Permit OC106555 by Ministry of Environment to include the polishing wetland were received May 10, 2021. As per section 4.4b, no non-compliances occurred during the reporting period.

This facility produces highly treated effluent that is discharged directly into the Okanagan River adjacent to the treatment plant site, and/or discharged to a constructed polishing wetland that then discharges into Okanagan River. In 2021, 214,398.6 m³ of treated effluent was discharged, with 62.4% (133,759.4 m³) being discharged to Okanagan River and 37.6% (80,639.2 m³) being discharged to the polishing wetland. Total flow into Okanagan River was 181,707.3 m³ with 73.6% (133,759.4 m³) discharged directly from the Wastewater Treatment Plant and 26.4% (47,947.9 m³) discharged directly from the polishing wetland. Overall flow to Okanagan River was reduced by 32,691.3 m³ or 15% by the first year's usage of the polishing wetland. The daily average flow rate of the Okanagan River was 1,264,218 m³/day.

The monthly 5-day biochemical oxygen demand (BOD) and/or monthly 5-day carbonaceous biochemical oxygen demand (cBOD) and monthly total suspended solids (TSS) were consistently less than the maximum allowable concentrations of 10 mg/L in 2021.

Total phosphorus loadings released from the WWTF were comparable in 2021 (31 kg/year) to 2020 (32 kg/year). However, due to diversion of effluent through the wetland, the amount discharged to Okanagan River was only 21 kg/year; a 32% decrease. The maximum total phosphorus of the effluent grab sample was 0.288 mg/L P on March 9, 2021 and the maximum total phosphorus of the wetland outlet grab sample was 0.0687 mg/L P on July 8, 2021. The annual average concentration for total phosphorus of the weekly effluent grab samples was 0.143 mg/L P, which is below the allowable limit of 0.20 mg/L P. For the 365 effluent composite samples analyzed in-house for total phosphorus, the annual average was also 0.147 mg/L P with a maximum of 1.30 mg/L P on August 23, 2021.

The average total nitrogen was 3.38 mg/L N from the monthly effluent compliance samples, well below the average annual limit of 6.0 mg/L N. There were no exceedances of Total Daily Nitrogen limit of 10 mg/L in either the accredited lab data (maximum was 5.67 mg/L N on February 17, 2021) or the in-house data for grab effluent samples. For in-house composite effluent samples, a maximum of 10.4 g/L N was measured on March 1, 2021. Total nitrogen concentrations were reduced in the polishing wetland to an average of 0.885 mg/L N. Similar to total phosphorus, total nitrogen loadings were reduced by 32% (from 725 kg/year to 495 kg/year) due to diversion of effluent through the polishing wetland.

The maximum allowable concentration in the effluent for *E. coli* is 2.2 CFU/100 mL from April 15th to October 15th and 50 CFU/100 mL from October 16th to April 14th annually. All results from the outside lab for *E. coli* in the effluent for 2021 met the compliance limits for the entire year. Of the 54 effluent compliance samples, *E. coli*

was detected nine times, with a maximum of 6 MPN/100mL on March 9, 2021. This was not the case for *E. coli* in wetland outlet discharges; 25 of the 26 samples were positive for *E. coli* ranging from 1410 MPN/100mL on August 27 to 1 MPN/100mL. These high values were attributed to plugging of the wetland sand filter that trapped and concentrated the *E. coli* from wildlife use within the wetland.

Commissioning of the constructed polishing wetland adjacent to the Okanagan Falls Wastewater Treatment Plant continued in 2021; first full year of operation. Effluent was discharged from the wastewater treatment plant to the constructed wetland from May 10 until Oct 29. Polished effluent was discharged from the wetland between March 1 and November 30 by flowing through a sand filter to remove coarse organic material and fine silt prior to being discharged into the Okanagan River via one of the two existing outfall diffusers which was part of the original Okanagan Falls BNR WWTF construction. Due to evapotranspiration occurring within the wetland, a net reduction of 15% flow or 32,691.3 m³ was not discharged to Okanagan River. Nutrients loading to Okanagan River were reduced by 32% for both total phosphorus and total nitrogen. Water quality data from offsite domestic/irrigation wells located southeast and south of the constructed wetland were collected in 2021.

Since operation began in 2013, samples have been collected from Okanagan River 100 m upstream as well as 100 m and 500 m downstream of the WWTP to evaluate possible impacts of the treated effluent on Okanagan River. Similarly, water quality in Vaseux Lake has been monitored to evaluate possible impacts from the WWTP. Larratt Aquatic Consulting, on the behalf of the Regional District of Okanagan Similkameen, statistically evaluated WWTP, Okanagan River and Vaseux Lake water quality data for possible impacts of the treated effluent on either of these two water bodies. In 2021, the WWTP effluent made up only 0.04% of the total flow, 0.45% of total nitrogen load and 0.34% total phosphorus load in Okanagan River at Okanagan Falls. Consequently, most of the annual nutrient loading into Vaseux Lake came from Okanagan River and internal nutrient recycling with the anoxic zone of Vaseux Lake. No statistical differences were detected for either total nitrogen or total phosphorus between upstream and downstream Okanagan River samples from 2013-2021. As noted by Larratt Aquatics Consulting, there appears to be subtle increases in chloride and conductivity in Okanagan River downstream of the WWTP. Benthic invertebrate samples appeared to show an impact with lower species richness at the downstream site compared to the upstream site during most years but the effect of climate and the 2017-2018 freshets continued to outweigh any potential impacts from the WWTP. From 2013 to 2021, there were no observed impacts from the WWTP operation on Vaseux Lake chemistry and biology.

Two types of thickened sludge are produced – Thickened Waste Activated Sludge (TWAS) and Fermented Primary Sludge (FPS) from the process. Currently both sludges are not dewatered onsite but instead hauled to Penticton's Advanced Wastewater Treatment Plant for further processing. The TWAS sludge hauled to Penticton in 2021 was estimated at 34,933 kilograms (dry weight) which is down 311 kg from 2020. The FPS sludge was estimated at 8,742 (dry weight) kilograms, which up by 2009 kg from the previous year. In 2021, all sludge samples met the requirements for Class B biosolids as specified in Provincial Organic Material Recycling Regulations. The RDOS purchased a centrifuge in 2020 and construction began on a building addition to allow the RDOS to process biosolids in house. The biosolids will then be transported to the Compost facility at the Campbell Mountain landfill in Penticton for further processing. This new addition will eliminate the need to send liquid sewage to the Penticton AWWTP greatly reducing costs and the RDOS carbon footprint in with regard to trucking.

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I. INTRODUCTION AND SITE BACKGROUND

In March of 2013, the Biological Nutrient Removal (BNR) Wastewater Treatment Facility (WWTF) at 300 Rail Road began operation (Lot A, Plan EPP42355 District Lot 10 Similkameen Division of Yale District). The Okanagan Falls BNR WWTF is located 2 km downstream of the old de-activated extended aeration activated sludge wastewater treatment facility of Cedar Street. The sewage collection system consists of three lift pump stations, pressurized forcemains and gravity sewer mains that deliver sewage to a new lift pump station at the old Facility at 1440 Cedar Street (Crown Reserve 11, Sub Lot 37, Similkameen Division of Yale District (S.D.Y.D.)). This new lift pump station pumps the sewage into a forcemain, which travels to the BNR Facility along Rail Road.

The old extended aeration activated sludge wastewater treatment plant, located on Cedar Street, ceased producing effluent in March 2013. Monitoring of well static levels at the rapid infiltration basins was discontinued in 2017 as the requirement of monitoring of these wells was for a minimum of 3 years after flow ceases. With no water present in 2014, 2015, and 2016 a notification was sent to MOE that the RDOS would no longer monitor the rapid infiltration basins. Acknowledgement of this notification was received December 31, 2017 from the Ministry of Environment BC.

The Okanagan Falls sewer system, facility and polishing wetland is owned and operated by the RDOS and serves approximately 1243 properties, including single-family, multi-family, commercial, recreational, and institutional uses. The BNR Wastewater Treatment Facility consists of screening, primary clarifier/fermenter, bioreactors, secondary clarifiers, filtration units, ultraviolet disinfection and discharge outlets to either the polishing wetland or the river channel. The constructed polishing wetland is located across from the WWTF with a civic address of 2026 Hwy 97 (Plan KAPI738B District Lot 10 Land District 54 Similkameen Division of Yale District).

Figure 1 shows an aerial view of site locations of Cedar Street Pump Station (old extended aeration wastewater treatment facility), of the old associated rapid infiltration basin, of the BNR WWTF and associated constructed polishing wetland (aerial and parcel view) and of Vaseux Lake.

Okanagan Falls BNR Wastewater Treatment Facility, constructed polishing wetland and river outfall are operated under the Operational Certificate (OC) No 106555, issued in 2013 and amended in 2021 by the BC MOE under the provisions of the Environmental Management Act (EMA). Figure 2 shows the three Okanagan River monitoring locations and the four groundwater offsite private well locations. Figure 3 shows the Vaseux Lake surface monitoring location. This report was prepared in accordance with the Annual Reporting requirements outlined in Section 4.4 of OC 106555. Appendix A provides a copy of this Operational Certificate. This report presents the monitoring activities from January 1 to December 31, 2021.

Analysis of our environmental monitoring data has been carried out by qualified environmental professionals through Larratt Aquatic and is included within this report. The full report prepared by Larratt Aquatic is available in Appendix U.



Aerial view of Okanagan Falls biological nutrient removal wastewater treatment facility



Aerial of Okanagan Falls wastewater treatment facility and constructed polishing wetland.

2. FACILITY AND REGULATORY SETTING

2.1 FACILITY DESCRIPTION

Highly treated effluent from the Okanagan Falls BNR WWTF is discharged directly into the Okanagan River immediately southwest of the treatment plant and/or into a constructed polishing wetland on the south side of Rail Road just across the road from the WWTF. The polishing wetland discharges directly into the Okanagan River also via one of the two outfall diffusers located on the WWTF site. The outfall diffusers consists of two laterals with duck billed diffuser ports that open only when flow is being discharged.

2.2 TOPOGRAPHY AND DRAINAGE

The regional topography is described as slightly hummocky and kettled. The general topography slopes to the southwest, towards the Okanagan River.

The Okanagan Falls BNR Wastewater Treatment Facility is located directly beside Okanagan River. At the beginning of construction, the top layer was determined to be loose silty sand and peat deposits for approximately 4 meters. These layers were removed and replaced with 150mm minus well-graded pit run sand and gravel that was left to preload and naturally compact on site. The material below the added sand and gravel is soft compressible fine-grained soils up to a depth of 15 m.

2.3 REGULATORY SETTING

The Operational Certificate (OC) 106555 was issued to the RDOS by the BC MOE in 2013, under the provisions of the Environmental Management Act. Amendments were made to this OC in 2021 to include an optional seasonal polishing wetland (operated from March 1st to November 30th) as authorized works of the wastewater treatment processes. A finalized amended Operational Certificate was received on May 10, 2021 from the BC MOE for OC 106555. According to Section 1.1.1 of the OC, the Facility is authorized to discharge effluent to the River Channel at a maximum rate of 225 l m³/day in 2021. Appendix A contains OC 106555

The existing monitoring and reporting requirements outlined in the amended OC, include the following:

- Influent monitoring (E292549) – quarterly sampling and analysis.
- Sludge monitoring (E292609) – bi-annually sampling and analysis of both sludges, in addition to recording of volumes of each sludge produced and sent offsite to Penticton’s Advanced Wastewater Treatment Plant (AWWTP) for dewatering.
- Effluent flow and monitoring after disinfection (E292449) – sampling and analysis of the effluent after disinfection, in addition to the recording of the daily effluent volume discharged to the wetland and/or Okanagan River.
- Wetland flow and monitoring (E319911) – measurement, sampling and analysis of wetland water quality and flow to Okanagan River.
- Annual groundwater monitoring of four private wells (E324131, E324132, E324133 and E324134) located southeast of the wetland along HWY 97

- Surface water monitoring – measurement, sampling, and analysis of surface water in sites along Okanagan River at 100m Upstream (E295990), 100m Downstream (E295991), and 500m Downstream (E295992) and in Vaseux Lake (E220331)

3. WASTEWATER TREATMENT MONITORING AND RESULTS

Regional District of Okanagan Similkameen staff collected the following samples:

- Compliance influent, sludge, effluent and wetland samples.
- Influent, effluent and wetland in-house samples for process control, both grab and composites.
- Groundwater samples from private wells southeast of wetland.
- Surface water samples from Okanagan River Channel upstream and downstream sites.

Larratt Aquatic Consulting staff collected the following samples

- Benthic samples from Okanagan River Channel upstream and downstream sites.
- Water chemistry and microflora samples from Vaseux Lake.

Collected samples were sent to independent accredited laboratories in accordance with the Operational Certificate. Wastewater, wetland, groundwater, surface water, sludge and bioassay samples were sent to CARO Analytical Services. Benthic samples were sent to Cordillera Consulting for taxonomy identification and numeration and these results are included in the Appendices of Larratt Aquatics Consulting Report in Appendix U.

In accordance with the terms and conditions of the Environmental Data Quality Assurance Regulation (EDQA), Certificates of Analysis for analytical results are provided in the relevant appendices containing the lab data. Quality control samples collected from the WWTF in 2021 consisted of triplicate and field blank samples for influent, effluent and Okanagan River 100m Downstream locations; triplicate samples for both types of sludge; triplicate samples for wetland outlet and trip blank samples at Vaseux Lake plus triplicates for both Vaseux Lake composite samples.

3.1 INFLUENT MONITORING AND RESULTS

In 2021, the Okanagan Falls BNR Wastewater Treatment Facility influent (E292549) was sampled quarterly for chemical analysis consisting of biological oxygen demand (BOD) or carbonaceous biochemical oxygen demand (cBOD), phosphorus and nitrogen parameters. Appendices B and C provides the database summary and lab data for 2021 influent samples respectively. Table I provides a summary of 2021, 2020 and 2019 influent data showing the averages, number of samples (n) and the standard deviation (Std. Dev.).

In 2021, quality control triplicate samples were collected in July by filling three 1-litre bottles in succession with influent using a 500 mL cup on a sampling pole. The triplicate data is included in the number of samples, n, in Table I above (i.e. quarterly samples, plus two replicates). A field blank was collected in April 21, 2021 by exposing the field blank bottle and water to the influent sampling site. Field blank water supplied by the

accredited lab was used as the field blank and all influent analytes were less than detection limit in the field blank. Quality Control data can be found in Appendix J.

Table I Summary of Influent Samples

Parameter	Average	n	Std. Dev.
2021			
BOD (mg/L)	228	5	43
cBOD (mg/L)	275	1	
Total Phosphorus (mg/L)	7.77	7	1.93
Ortho Phosphorus (mg/L)	3.84	7	0.68
Total Nitrogen (mg/L)	63.4	7	14.1
2020			
BOD (mg/L)	227	6	34
Total Phosphorus (mg/L)	7.25	6	0.83
Ortho Phosphorus (mg/L)	4.27	6	0.45
Total Nitrogen (mg/L)	62.7	6	7.6
2019			
BOD (mg/L)	298	6	34
Total Phosphorus (mg/L)	9.89	6	0.76
Ortho Phosphorus (mg/L)	4.59	6	0.25
Total Nitrogen (mg/L)	78.3	6	5.1

3.2 SLUDGE MONITORING AND RESULTS

Okanagan Fall BNR WWTF produces two thickened sludges; TWAS (thickened waste activated sludge) and FPS (fermented primary sludge). Samples were analyzed in 2021 for total solids and leachable metals as listed in OC 10655. In 2021, all of the samples met the requirements for Class B biosolids from Organic Material Recycling Regulations, Schedule 4, column 3. Appendices D and E provides the database summary and lab data for both of these sludges (E292609). Table 2 and 3 provides a summary of 2021 and 2020 sludge samples leachable metal analyses.

Quality control samples in 2021 consisted of triplicate samples collected in July on both the TWAS and the FPS sludges by filling six sample containers per sample location in succession using a 500 mL cup on a sampling pole. The triplicate data is included in the number of samples, n, in Table 2 and 3 below. Quality Control data can be found in Appendix J.

Table 2 Summary of Fermented Primary Sludge (FPS) Samples

FPS	2021			2020		
	Average	n	Std. Dev.	Average	n	Std. Dev.
Total solids, %	8.0	6	3.6	5.6	6	1.0
Arsenic, ug/g	3.22	6	0.93	2.99	6	0.53
Cadmium, ug/g	0.861	6	0.214	0.904	6	0.138
Chromium, ug/g	71	6	140	16.2	6	2.7
Cobalt, ug/g)	0.90	6	0.29	0.85	6	0.07
Copper, ug/g	211	6	53.9	212	6	16.4
Lead, ug/g	9.28	6	2.2	10.1	6	2.57
Mercury, ug/g	0.407	6	0.107	0.467	6	0.131
Molybdenum, ug/g	7.32	6	1.88	6.34	6	0.67
Nickel, ug/g	9.73	6	2.56	8.46	6	0.45
Selenium, ug/g	3.83	6	0.98	4.22	6	0.53
Zinc, ug/g	642	6	149	657	6	100

Table 3 Summary of Thickened Waste Activated Sludge (TWAS) Samples

TWAS	2021			2020		
	Average	n	Std. Dev.	Average	n	Std. Dev.
Total solids, %	2.3	6	.1	2.6	6	0.3
Arsenic, ug/g	2.70	6	0.71	2.79	6	0.71
Cadmium, ug/g	0.865	6	0.285	0.747	6	0.119
Chromium, ug/g	7.4	6	2.1	6.2	6	1.4
Cobalt, ug/g)	1.0	6	0.24	0.98	6	0.22
Copper, ug/g	241	6	77.3	223	6	53.2
Lead, ug/g	7.32	6	1.96	6.15	6	2.85
Mercury, ug/g	0.20	6	0.056	0.150	6	0.032
Molybdenum, ug/g	7.3	6	2.02	6.94	6	1.67
Nickel, ug/g	8.38	6	2.39	6.21	6	1.13
Selenium, ug/g	6.29	6	2.08	5.12	6	1.29
Zinc, ug/g	524	6	147	471	6	118

3.3 FLOWS: EFFLUENT, WETLAND AND OKANAGAN RIVER

In 2021, the average effluent discharged after disinfection was 587 m³/day. The maximum rate of discharge from the WWTP after disinfection was recorded on August 19 at 845 m³. However, the maximum combined rate of discharge from both the WWTP and the wetland to the Okanagan River was recorded on March 2 at 1,562 m³. The wetland discharge valve was opened March 1 to drain winter precipitation and groundwater accumulation (December 1 to February 28) prior to the growing season when effluent would

be discharged into the wetland. Both of these maximums are below the maximum authorized effluent discharge rate of 2,251 m³/day stipulated in Section 1.1.1 of the OC for the year 2021. The minimum flow from the WWTP after disinfection was recorded on April 21 in 2021 at 292 m³/day as flow to the WWTP from Cedar Street lift station was stopped for 6 hours during confined space entry into the bioreactor for seasonal inspection and repairs.

Commissioning of the wetland continued in 2021 with good establishment of cattails, allowing effluent leaving the WWTP after disinfection to be optionally discharged to either the wetland from March until November and/or continuously discharged to Okanagan River for all months of the year. In total 80,639.2 m³ of effluent was discharged to the wetland between May 10 and October 29 and 47,947.9 m³ was discharged from the wetland to Okanagan River from March 1 to November 30. Thus, 32,691.3 m³ of effluent was diverted from discharging into Okanagan River in 2021 due to evapotranspiration. Flow to Okanagan River ranged from just 1 m³ when the constructed wetland was not discharging, but receiving almost all of the flow from the WWTF to 1562 m³ when accumulated winter precipitation in the wetland and all of the WWTF flows were both being discharged to Okanagan River.

A summary of the total, average, minimum and maximum flows from the WWTP to wetland and/or Okanagan River and from wetland to Okanagan River has been summarized in Table 4 below. Figure 4 graphs 2021 monthly effluent and wetland flows, while daily flow data are in Appendix G.

Table 4 Summary of Effluent and Polishing Wetland Flows

	From WWTP to Wetland	From WWTP to Okanagan River	From Wetland to Okanagan River	Total WWTP Effluent	Total Effluent and Wetland flows to Okanagan River
Average, m ³ /day	510	366	241	587	498
Minimum, m ³ /day	0	0.4	0	292	1
Maximum, m ³ /day	774	718	1020	845	1562
Total, m ³ /year	80,639.2	133,759.4	47,947.9	214,398.6	181,707.3
Number of days	158	365	199	365	365

From data supplied by Environment Canada, Water Office,¹ the average daily flow in Okanagan River at Station 08NM002 was 1,264,217.6 m³/day, with maximum flow 3,100,496.4 m³/day occurring on May 5th, 2021 and minimum flow 458,371.4 m³/day occurring on December 27, 2021. Dilution factors in 2021 ranged from a maximum of 6,077,248 on May 12th to a minimum of 839 occurring October 17th, with an average dilution factor of 27,261. Table 5 provides a summary of 2021 to 2019 WWTP effluent flows after disinfection and Okanagan River flows. Daily 2021 flows are in Appendix G. Figure 5 graphs monthly effluent flows after disinfection for 2019 to 2021.

Table 5 Summary of Effluent and Okanagan River Flows (Station 08NM002)

	Flow to Okanagan River From Effluent and/or Wetland	Okanagan River Flow (Station 08NM002)	Dilution Factor = (OK River + WWTP) WWTP
2021			
Average, m ³ /day	497.8	1,264,217.6	27,261
Minimum, m ³ /day	0.5	458,371.4	839
Maximum, m ³ /day	1562.1	3,100,496.4	6,077,248
Total, m ³ /year	181,707.3	461,439,419.2	
2020			
Average, m ³ /day	542	2,938,440	10,531
Minimum, m ³ /day	9	897,325	1,124
Maximum, m ³ /day	1,113	6,894,176	315,877
Total, m ³ /year	198,497	1,075,469,017	
2019			
Average, m ³ /day	517	1,051,352	2,119
Minimum, m ³ /day	123	695,002	1,194
Maximum, m ³ /day	808	1,412,417	8,350
Total, m ³ /year	188,765	383,743,391	

3.4 EFFLUENT AND WETLAND MONITORING AND RESULTS

Effluent pH and temperature were measured continuously via an online HACH Digital PEEK pH/Temperature probe located in the treated effluent channel. Effluent (E292449) samples for analysis by an independent accredited laboratory were collected in appropriate laboratory-supplied sample containers and preserved as required by RDOS staff. Samples were submitted under chain-of-custody protocol, to Caro Analytical Services for analysis as follows:

- weekly for chemical oxygen demand (COD), ammonia-nitrogen, nitrite-nitrogen, nitrate-nitrogen, total phosphorus, orthophosphorus, total suspended solids, UV transmittance at 254 nm, Fecal Coliforms and E. Coli.;
- monthly for biochemical oxygen demand (BOD₅) or carbonaceous biochemical demand (cBOD₅), organic nitrogen, total kjeldahl nitrogen, total nitrogen, dissolved total phosphorus and pH;
- quarterly for alkalinity, carbonaceous biochemical oxygen demand (cBOD₅), hardness, metals and common anions.
- annually for toxicity testing, 96-hour RBT single concentration

The summary statistics provided in Table 6 are from the weekly and/or monthly samples submitted to an independent laboratory with the exception of pH and temperature, which are based on daily 24-hour average online results. Complete effluent database summaries and laboratory reports are presented in Appendices H and I respectively. Annual toxicity bioassay was completed on June 21, 2021 and results are presented in Appendix K. There were no mortalities in effluent concentration of 100%.

Table 6 Effluent Water Quality Summary Statistics

Parameter	Average	n	Std. Dev.	Minimum	Maximum
Biochemical Oxygen Demand (BOD ₅) (mg/L)	1.8	9	1.6	<1	6.1
Carbonaceous Biochemical Oxygen Demand (cBOD ₅) (mg/L)	2.7	10	1.9	<2.4	6.3
Total Suspended Solids (mg/L)	1.4	52	0.8	<2.0	4.0
pH, daily online measurement	6.92	365	0.08	6.41	7.14
Temperature, (°C) daily online measurement	16.3	365	4.5	8.4	23.7
Ammonia-Nitrogen as N (mg/L)	0.492	52	0.654	0.08	3.88
Nitrate-Nitrogen as N (mg/L)	1.70	52	1.05	<0.010	4.11
Nitrite-Nitrogen as N (mg/L)	0.080	52	0.067	<0.010	0.261
Total Kjeldahl Nitrogen, (mg/L)	1.71	12	0.51	1.09	2.68
Organic N, (mg/L)	1.29	12	0.21	0.93	1.68
Total Nitrogen, (mg/L)	3.38	12	1.2	1.57	5.67
Orthophosphate as P (mg/L)	0.0251	52	0.0243	<0.005	0.124
Total Phosphorus, (mg/L)	0.143	52	0.040	0.076	0.265
E. Coli, (MPN/100mL)	1	52	1	<1	6

Table 7 provides comparison of the OC 106555 nutrient limits with the effluent compliance samples collected after disinfection and sent to the independent laboratory for analyses.

Table 7 2021 Effluent Compliance Samples summary compared to OC Requirements

Parameter	OC limit	WWTP (average)	WWTP (maximum)
Biochemical Oxygen Demand (BOD ₅) or carbonaceous Biochemical Oxygen Demand (cBOD ₅) (mg/L)	10 mg/L Maximum	1.8 2.7	6.1 6.3
Total Suspended Solids (mg/L)	10 mg/L Maximum	1.4	4.0
Total Phosphorus, Maximum Annual Average	0.20 mg/L	0.143	
Total Phosphorus, Maximum Daily Concentration	2.0 mg/L		0.288
Total Phosphorus, Total Annual Discharge	300 kg/yr.		32
Total Nitrogen, Maximum Daily Concentration	Less than 10 mg/L		5.67
Total Nitrogen, Annual Average	6.0 mg/L	3.38	
E. Coli, April 15 to October 15	2.2 CFU/100 mL	<1	1
E. Coli, October 16 to April 14	50 CFU/100 mL	<1	6

Effluent quality control samples in 2021 consisted of a set of triplicate effluent samples analyzed for quarterly parameters, and a field blank sample of double deionized water exposed to the effluent sampling site and analyzed for quarterly parameters as defined above. The field blank was collected on April 20, 2021 by attaching the required bottles to the sampling pole, removing the lids, and lowering the sample pole with bottles attached into the effluent channel just after disinfection, but not letting the bottles touch the water. The bottles were then removed from the sample pole and filled with double de-ionized water supplied by an independent laboratory and preserved as required immediately in the field. Triplicate samples were

collected on July 21, 2021. Since it is not practical to attach all of the required bottles in triplicate to the sampling pole at once, the following protocol was used.

- Disinfect sampling pole with 70% to 90% ethanol, prior to attaching sample bottles.
- Attach in triplicate bacteriological sample bottles to sampling pole, remove cap and collect samples.
- As quickly as possible remove the bacteriological bottles from the sampling pole and replace caps.
- Attach in triplicate, 1-Litre sample bottles to sampling pole, remove caps and collect sample
- As quickly as possible remove the 1-Litre bottles from the sampling pole and replace the caps.
- Attach 125-mL bottles and 60-mL bottles required in triplicate to sampling pole, remove caps and collect sample
- As quickly as possible remove the 125-mL and 60-mL bottles from the sampling pole and replace caps.
- Add required preservatives to sample bottles, once back in the WWTP in-house laboratory.

The field blank sample was below detection limit for all nutrients and total metals, except for total copper that was detected at 0.00055 mg/L Cu. The detection limit for total copper is <0.00040 mg/L C. The average copper in the effluent was 0.00213 mg/L; an order of magnitude above the copper detected in the field blank sample. Therefore, the small amount of copper in the effluent field blank is negligible. Database summary of quality control effluent and field blank samples are in Appendix J.

In-house effluent (E292499) sampling consisted of grab and composite samples monitored for total phosphorus, reactive orthophosphate, ammonia, nitrate, nitrite, total nitrogen, pH and temperature. A HACH Sigma SD900 composite sampler with a 4-bottle swing arm configuration programmed to collect 48 samples per bottle was used to collect approximately 100 mL of effluent sample every 30 minutes from the effluent channel. The use of a swing arm with multiple bottle configuration minimizes the chance of missed composite samples. Grab samples were taken from the effluent channel by dipping sample bottles or a sample cup secured onto the end of a sample pole into the effluent channel. With the exception of pH and temperature, nutrient analyses were performed on a HACH DR3900 Spectrophotometer using associated Test-N-tube or powder pillow methodologies for ammonia, nitrate, nitrite, total nitrogen, orthophosphate and total phosphorus. pH and temperature were recorded using online HACH Digital PEEK pH/temperature probe in the effluent channel for continuous monitoring via SCADA output. Continuous effluent monitoring for ammonia, reactive orthophosphate, and nitrate plus nitrite was performed using a ChemScan online analyzer with output to SCADA. Appendix L contains 2021 raw data, graphs and summary statistics for in-house grab and composite effluent samples, online nutrient monitoring data and independent accredited laboratory effluent data. Data reported as less than detection limit, were treated as a zero for the purpose of graphical representation.

Commissioning of the constructed polishing wetland resumed in 2021 while concurrently working with the Ministry of Environment on amendments to Operational Certificate 106555 to include optional seasonal operation of the polishing wetland (March 1 to November 30) and effluent monitoring at the end of the wetland (E319911). An amended OC 106555 was received on May 10, 2021.

A healthy growth of cattails was established in 2020 and ready to receive effluent at the start of the 2021 growing season. The wetland discharge valve was opened March 1 to drain winter precipitation and groundwater accumulation (December 1, 2020 to February 28, 2021) prior to the growing season when effluent would be discharged into the polishing wetland. In total, 80,639.2 m³ of effluent was discharged to the polishing wetland between May 10 and October 29 and 47,947.9 m³ was discharged from the polishing wetland to Okanagan River from March 1 to November 30. Thus, 32,691.3 m³ of effluent was diverted from discharging into Okanagan River in 2021 due to evapotranspiration. Flows from the WWTP to the wetland, from the WWTP to Okanagan River and from the wetland to Okanagan River have been summarized in Table 4 in section 3.3 above. Appendix G provides a detailed tabulation of these flows.

Monitoring requirements and frequencies from the wetland outlet (E319911) when discharging to the Okanagan River during the commissioning phase April 30, 2021 to November 20, 2022 are listed in Section 3.5.2 of the amended OC 10655 and have been summarized below.

- weekly for temperature and pH using a meter and a grab sample for total phosphorus
- bi-weekly grab sample for *E. coli*;
- monthly grab sample for carbonaceous biochemical oxygen demand (cBOD₅) ammonia-nitrogen, nitrite-nitrogen, nitrate-nitrogen organic nitrogen, total kjeldahl nitrogen, total nitrogen, and total suspended solids;
- annual grab sample for total metals, and common cation and anions.

A portable peristaltic pump was used to draw water through the wetland outlet sample port into a container where temperature and pH was measured continuously using a portable temperature/pH meter. Once temperature had stabilized, wetland outlet (E319911) samples for analysis by an independent accredited laboratory were collected in appropriate laboratory-supplied sample containers and preserved as required by RDOS staff. Samples were submitted under chain-of-custody protocol, to Caro Analytical Services for analysis.

Wetland outlet 2021 quality control samples consisted of a set of triplicates analyzed for monthly parameters are presented in Appendix J. Data in Appendix M to Appendix O contains field parameters and independent accredited laboratory data and reports for wetland water samples. Table 8 below provides a summary of the wetland water quality data from samples collected from the outlet sampling port when the wetland was discharging to Okanagan River.

Table 8 Polishing Wetland Water Quality Summary Statistics

Parameter	Average	n	Std. Dev.	Minimum	Maximum
Carbonaceous Biochemical Oxygen Demand (cBOD ₅) (mg/L)	3	10	1.7	<1	<7.4
Total Suspended Solids (mg/L)	1.9	10	2.5	<2.0	9.4
pH, daily online measurement	7.32	30	0.20	6.97	7.82
Temperature, (°C) daily online measurement	14.3	30	6.3	2.9	23.5
Ammonia-Nitrogen as N (mg/L)	0.054	10	0.025	<0.05	0.099
Nitrate-Nitrogen as N (mg/L)	0.115	10	0.091	<0.010	0.212
Nitrite-Nitrogen as N (mg/L)	<0.010	10	0	<0.010	<0.010
Total Kjeldahl Nitrogen, (mg/L)	0.839	10	0.280	0.611	1.47
Organic N, (mg/L)	0.821	10	0.280	0.611	1.47
Total Nitrogen, (mg/L)	0.885	10	0.251	0.711	1.47
Total Phosphorus, (mg/L)	0.037	32	0.0113	0.023	0.0687
<i>E. coli</i> , (MPN/100mL)	102	26	296	<1	1410

In addition to the samples sent to an independent accredited laboratory, field parameters and in-house samples were collected by RDOS staff weekly from the outlet port when discharging to the Okanagan River. Field parameters were either measured using a HACH HQ40d portable temperature and pH meter or using a YSI Pro Plus multi-meter for temperature, pH, dissolved oxygen [DO], oxidation-reduction potential [ORP], conductivity [EC], and total dissolved solids [TDS]. In-house weekly wetland outlet grab samples were analyzed for total phosphorus, ammonia, nitrate, nitrite, total nitrogen on a HACH DR3900 Spectrophotometer using associated Test-N-tube. Total suspended solids were measured using gravimetric method with AH934 glass fiber filter discs dried at 103 °C to 105 °C as per Standard Methods 2540 D, 22nd Edition. Field parameters and in-house data can be found in Appendix M along with the data from the independent accredited laboratory.

Figures 6 to 12 show 2019 to 2021 time series plots for the parameters listed in Table 7 and Table 8 above, plus the total phosphorus and total nitrogen in-house analysis on effluent composite samples. Data that was reported as below the detection limit are plotted as zero on the time series plot.

Since operation began in 2013, there have been no exceedances for the maximum daily concentration, 10 mg/L, of Biological Oxygen Demand (BOD₅) of the effluent sampled monthly. The May 2021 OC 106555 amendment resulted in a change from Biological Oxygen Demand (BOD₅) to carbonaceous Biochemical Oxygen Demand (cBOD₅), with the maximum remaining unchanged at 10mg/L for (cBOD₅). Since 2020, we have requested the independent accredited laboratory use the lowest detection limit for BOD and cBOD on effluent to provide data that are more meaningful. Depending on the dilution ratio used by the independent accredited laboratory when performing this test, detection limits ranged from <1 mg/L to <7.4 mg/L and results ranged from 1.2 mg/L to 6.3 mg/L for effluent in 2021. The BOD₅ and cBOD₅ values from

2019 to 2021 are plotted in Figure 6. As expected in low ammonia samples, the difference between BOD₅ and cBOD₅ values is small.

Similarly, since operation of the BNR WWTF began in 2013, there have been no exceedances for the maximum daily concentration, 10 mg/L, of Total Suspended Solids (TSS) of the effluent sampled weekly. The effluent TSS results from the independent accredited laboratory ranged from <2 mg/L to a maximum of 4.0 mg/L with an average of 1.4 mg/L in 2021. Monthly wetland TSS concentrations were higher in the spring when the wetland water level was lowered in March after winter stoppage and during the initial flows of effluent into the wetland in May. For the remainder of the wetland seasonal operation, June to November, the monthly TSS levels remained below detection limit of <2.0 mg/L. The TSS results for the treated effluent from 2019 to 2021 and for the wetland for 2021 are presented in Figure 7.

In 2021, the annual average total phosphorus from grab samples sent to independent laboratory was 0.143 mg/L P, which is below the maximum allowable annual average for total phosphorus of 0.20 mg/L. There were no exceedances of the maximum daily allowable concentration of 2.0 mg/L P in 2021. The total phosphorus discharged from WWTP samples collected after disinfection was 31 kg/yr. almost 10 times lower than the allowable annual discharge of 300 kg/yr. The total phosphorus in weekly wetland samples averaged 0.037 mg/L P; approximately 3.9 times lower than the average 2021 total phosphorus concentration in WWTP effluent. Figure 8 shows the trend of total phosphorus levels in grab effluent and wetland samples analyzed by CARO Analytical Services

As shown in Figure 9, with the exception of a few events over the last three years, total phosphorus levels in the effluent has remained steady. The rolling average total phosphorus in the daily effluent composite has remained relatively stable ranging from 0.134 to 0.159 mg/L P over the three-year period 2019 to 2021.

The daily effluent composite samples were analyzed in-house using HACH TNT 843 method on a HACH DR3900 spectrophotometer. In 2021, daily effluent composite total phosphorus analyzed in-house ranged from 0.069 to 1.30 mg/L P, with an annual average of 0.147 mg/L P. The in-house composite effluent data is in Appendix L.

Figure 10 plots the effluent total nitrogen data from 2019 to 2021 and 2021 wetland total nitrogen data. This graph illustrates the effluent total nitrogen monthly or weekly data, while variable, shows an overall trend of remaining below the 6 mg/L annual average since 2019. In 2021, the plant achieved an annual average of 3.38 mg/L N for the compliance samples analyzed by independent accredited laboratory. None of the accredited lab results, nor any of the in-house effluent grab samples exceeded the maximum allowable daily concentration of 10.0 mg/L N in 2021. Monthly total nitrogen concentrations discharged from the wetland averaged 0.885 mg/L N; approximately 3.8 times lower that the average 2021 total nitrogen concentrations in WWTP effluent.

The rolling average total nitrogen has remained steady in the daily effluent composite samples analyzed in-house since the fall of 2019, even though there has been as a large range in 2019 to 2021 values (1.13 to

10.4 mg/L N) as shown in Figure 11. In 2021, a daily effluent composite total nitrogen maximum of 10.4 mg/L N occurred on March 1, a minimum of 1.76 on May 31, and an annual average of 4.62 mg/L N. Total nitrogen in-house samples (grab and composite) were analyzed using HACH TNT 826 method on a HACH DR3900 spectrophotometer. The in-house composite effluent data is in Appendix L.

Figure 12 is a 2019 to 2021 time series plot of weekly effluent *E. coli* data and 2021 *E. coli* wetland discharge data. Please note the two different y-axis scales on this graph; left-side for effluent *E. coli* 0 to 50 scale and right-side for wetland *E. coli* 0 to 1500 scale. The two different scales on this graph was required due to the large difference in *E. coli* MPNs between the effluent after UV disinfection (<1 to 6 MPN/100mL) and the wetland outlet *E. coli* MPNs (<1 to 1410 MPN/100mL). In 2021, there were no exceedances of *E. coli* in effluent results; maximum of 6 MPN/100 mL was recorded on March 9, 2021. For the wetland the maximum of 1410 MPN/100mL was recorded on August 27, 2021. During commissioning this year, drainage problems were experienced in the sand filter, resulting in pooling water on the sand filter surface accumulating coliforms compared to the cross ditches.

Overall, the quality of the treated effluent from the Okanagan Falls BNR WWTF has been steady during the last 3 years of operation, for biochemical oxygen demand, total suspended solids, total phosphorus, total nitrogen and *E. coli* concentrations. In 2021, the commissioning of the constructed polishing wetland continued with effluent being discharged to the wetland for 158 days between May 10 and October 29. As noted above average concentrations for both total phosphorus and total nitrogen were reduced by approximately 3.8 to 3.9 time. This reduction in nutrient concentrations by the polishing wetland, in conjunction with reduced flows to Okanagan River, lowered nutrients loads to Okanagan River as discussed below.

Nutrients loading to Okanagan River were reduced by 32% for both total phosphorus and total nitrogen by the polishing wetland in 2021 due to both a reduction in phosphorus and nitrogen concentrations and flows into Okanagan River. Carbonaceous biochemical oxygen demand (cBOD) and total suspended solids loadings were Reduction in nutrient loadings to Okanagan River are given in Table 9 below.

Table 9 Nutrient Loadings from WWTP and Polishing Wetland (kg/yr.)

Parameter (kg/yr.)	Total Loadings from WWTP after disinfection	Loadings from WWTP to Okanagan River	Loadings from Polishing Wetland to Okanagan River	Total Loadings to Okanagan River	Reduction in Loadings to Okanagan River	Reduction in Loadings to Okanagan River, %
Biochemical Oxygen Demand (BOD ₅)	385.9	240.8	No BOD data			
Carbonaceous Biochemical Oxygen Demand (cBOD ₅)	578.9	361.21	143.8	505.0	73.9	13%
Ammonia-Nitrogen as N	105.5	65.8	2.6	68.4	37.1	35%
Nitrate-Nitrogen as N	363.9	227	5.5	232.5	131.4	36%
Nitrite-Nitrogen as N	17.1	10.7		10.7	6.4	38%
Total Kjeldahl Nitrogen	366.3	228.5	40.2	268.7	97.5	27%
Organic N,	277.2	172.9	39.4	212.3	64.9	23%
Total Nitrogen	724.7	452.1	42.4	494.6	230.1	32%
Total Phosphorus	30.7	19.2	1.8	20.9	9.8	32%
Total Suspended Solids	300.2	187.3	91.0	278.3	21.9	7%

4. GROUNDWATER AND SURFACE WATER MONITORING AND RESULTS

In 2020, an independent hydrogeologist identified four groundwater wells to be sampled to provide background data of groundwater above and south of the constructed wetland across from Okanagan Falls BNR WWTF. The BC Ministry of Environment subsequently incorporated these four wells to be sampled annually into the amended OC106555. The location of the four properties and constructed wetland are shown in Figures 1 and 2. There were civic address errors for the wells with Plate ID 17895, and Plate ID 37318 that were not identified until the fall of 2021, after the amended OC 106555 has been issued in May of 2021. The correct civic address for well with Plate ID 17895 (EMS ID E324132) is 2050 Hwy 97 and the correct civic address for well with Plate ID 37318 (EMS ID E324133) is 2100 Hwy 97.

Surface water monitoring required under OC 10655 includes four sites - three on Okanagan River and one in Vaseux Lake as summarized in Table 10 below. Figures 1 to 3 show the location of the BNR wastewater treatment plant, the polishing wetland, offsite well locations and the surface water sampling locations.

Table 10 Groundwater and Surface Water Monitored Locations

Monitored Location	EMS #	Description	2021 Sampling Frequency
1998 Hwy97	E324131	Domestic well southeast of wetland construction. Provincial Well	Fall 2021
2050 Hwy 97 (2126 Hwy 97 civic address was incorrect in 2020)	E324132	Domestic well southeast of wetland construction. Provincial Well ID 17895	Fall 2021
2100 (2150A Hwy 97 civic address was incorrect in 2020).	E324133	Irrigation well in vineyard south of wetland construction. Well Plate Id 37318	Fall 2021
2150 Hwy 97	E324134	Domestic well south of wetland construction.	Fall 2021
Ok River 100m Upstream	E295990	Northwest of BNR WWTP	Monthly*
OK River Downstream 100m of diffuser	E295991	South of diffuser at BNR WWTP	Monthly*
OK River Downstream 500m of diffuser	E295992	South of diffuser at BNR WWTP	Monthly*
Vaseux Lake	E220331	Central deep location (ice off to November)	Monthly

*In addition to the monthly samples, microbiological samples are required weekly for these three sites from May to September.

4.1 GROUNDWATER AND SURFACE WATER MONITORING METHODS

For groundwater well sampling, field parameters were continuously monitored during a sampling event using an YSI Pro Plus multi-meter submerged in a steady flow of groundwater from the well. Field parameters for conductivity, temperature and pH were allowed to stabilize before any samples were collected to ensure samples were representative of the groundwater and all piping has been adequately flushed. RDOS staff followed the sampling protocol outlined below.

- Field measurements of temperature, dissolved oxygen [DO], conductivity [EC], total dissolved solids [TDS], pH and oxidation reduction potential [ORP] were recorded every 5 minutes.
- Samples were collected once conductivity, temperature and pH readings from the multi-meter had stabilized.
- Groundwater samples were collected in the appropriate laboratory-supplied sample containers and preserved as required.
- Groundwater samples were submitted under chain-of-custody protocol, to Caro Analytical Services for analysis of general chemistry parameters, anions, nutrients, microbiology, dissolved metals and total metals.

In order to ensure that representative surface water quality samples were obtained from Okanagan River upstream and downstream of the BNR WWTP, and that no contamination of the recovered samples occurred, the following sampling protocols were adhered to during the monitoring events by RDOS staff:

- Disinfect, with 70% to 90% ethanol, the sampling pole prior to attaching sample bottles.
- Collect Okanagan River samples in areas of the surface water body that were representative of the surface water body conditions.
- Collect samples approximately 15 centimeters below the surface with the sample bottle completely submerged to prevent floating debris from entering the sample bottles.

-
- Collect samples in the appropriate laboratory-supplied sample containers and preserved as required.
 - Submit samples, under chain-of-custody protocol, to Caro Analytical Services for analysis of general chemistry parameters, anions, nutrients, microbiology and total metals.

During each monthly Okanagan River monitoring event, field measured parameters included temperature, pH, dissolved oxygen [DO], oxidation-reduction potential [ORP], conductivity [EC], total dissolved solids [TDS], and turbidity. (Measured using an YSI Pro Plus multi-meter and a HACH portable turbidity meter). Water quality samples were collected for the chemical parameters defined in OC 106555.

Monthly testing of Okanagan River samples was conducted by RDOS staff in accordance with OC 106555 from January to December for the above parameters with additional testing completed weekly from May to September for Microbiological samples. A review of the data for these parameters for 2021 can be found in Appendix Q.

Sampling at Vaseux Lake was carried out by Larratt Aquatic on behalf of the Regional District for the collection of water chemistry, phytoplankton, zooplankton and field parameters (Secchi depth, conductivity, density, dissolved oxygen, salinity, temperature and total dissolved solids) for the identified sampling location on Vaseux Lake. In 2021, sampling started in March and continued monthly until November.

- Lake water samples were collected at the central deep sampling location is identified as EMS#220331 and has site coordinates of Lat 49.287684, Long -119.529662.
- Sample were collected in the appropriate laboratory-supplied sample containers and preserved as required.
- Water chemistry samples were collected within the epilimnion and hypolimnion of the lake. Two composite samples were collected – one at 1, 5 and 10m representing the epilimnion and the other at 20, 22 and 24m representing the hypolimnion.
- Water chemistry samples were submitted under chain-of-custody protocol, to Caro Analytical Services for analysis of general chemistry parameters, nutrients, total metals, and chlorophyll A.
- Field parameters (Temperature, Salinity, Density, Dissolved Oxygen, Total Dissolved Solids and Conductivity) were taken using a multi-meter probe at one-meter intervals from the water surface to the bottom sediments.
- Algae samples were collected at 0, 10 and 20 m depths and their algae contents (Diatoms, Yellow-Brown Algae, Green Algae, Cyanobacteria, and Flagellates) were identified and enumerated by Larratt Aquatics.
- Phytoplankton and zooplankton were sampled qualitatively for type and abundance by towing an 80 um net at 1m below the water surface. Larratt Aquatics analyzed the samples using light microscopy.

In addition to Vaseux Lake sampling, Larratt Aquatics conducted annual benthic invertebrate sampling at the three sites in Okanagan River in October 2021. Benthic samples were submitted by Larratt Aquatics to

Cordillera Consulting for taxonomic sorting and identification; results are included as an appendix in Larratt Aquatic Consulting report in Appendix U.

4.2 GROUNDWATER AND SURFACE WATER MONITORING RESULTS

All four wells, three domestic wells at 1998 Hwy 97, 2050 Hwy 97 and 2150 Hwy 97 and an irrigation well located at 2100 Hwy 97 were sampled once in the fall, September 15, 2021. The well at 2050 HWY 97 was re-sampled again November 29, 2021 to determine if the presence of total coliforms detected at ≥ 2 CFU/100 mL was coming from the well itself or from piping between the well and the outside hose bib sampling point. The November 29 sample from the well-head itself was again positive for total coliforms at 2 CFU/100mL, but fecal coliforms and E. Coli were not detected at the well head sample in the November 29 sample. Appendix O contains the water quality database summaries for each of these four wells, while Appendix P contains the independent laboratory results. Comparisons were made to BC Source Drinking Water Quality Guidelines (BC SDWQG), BC Approved and Working Water Quality Guidelines for Irrigation (BCAWQG I and BCWWQG I) and to federal Guidelines for Canadian Drinking Water Quality (GCDWQ). Drinking water quality exceedances for these four wells are summarized Table II below.

Table II Summary of 2021 Water Quality Exceedances in Groundwater Wells South-east and South of Polishing Wetland

Sampling Location	Guideline ¹	Exceedances ²
1998 Hwy 97	GCDWQ MAC	Arsenic (total and dissolved), Fluoride
	GCDWQ AO	Total dissolved solids (F)
	BC SDWQG MAC	Arsenic (total and dissolved), Fluoride
2050 Hwy 97	GCDWQ MAC	Fluoride, Total Coliforms
	GCDWQ AO	Iron (total), Manganese (total and dissolved), Total dissolved solids (F)
	BC SDWQG MAC	Fluoride, Selenium (total and dissolved)
	BC SDWQG AO	Iron (total), Manganese (total and dissolved)
2100 Hwy 97	GCDWQ AO	Aluminum (dissolved), Manganese (dissolved)
	BC SDWQG AO	Manganese (dissolved)
2150 Hwy 97	GCDWQ MAC	No exceedances
	GCDWQ AO	No exceedances
	BC SDWQG MAC	No exceedances
	BC SDWQG AO	No exceedances

1. GCDWQ MAC = Guidelines for Canadian Drinking Water Quality Maximum Acceptable Concentrations
 GCDWQ AO = Guidelines for Canadian Drinking Water Quality Aesthetic Objectives
 BC SDWQG MAC = BC Source Drinking Water Quality Guidelines Maximum Acceptable Concentrations
 BC SDWQG AO = BC Source Drinking Water Quality Guidelines Aesthetic Objectives
2. [F] = Field Result(s)

Quality control sampling of the Okanagan River in 2021 consisted of one set of triplicates and a field blank sample taken at the 100m downstream monitoring site. The field blank was collected on April 20, 2021 by attaching the required bottles to the sampling pole, removing the lids, and swinging the sample pole with bottles attached over the surface water and back again, but not letting the bottles touch the water. The bottles were then removed from the sample pole and filled with double de-ionized water supplied by an

independent laboratory and preserved as required immediately in the field. Triplicate samples were collected on July 21, 2021. Since it is not practical to attach all of the required bottles in triplicate to the sampling pole at once, the following protocol was used. The same sampling method described in Section 4.1 was used for each triplicate bottle cluster at the 100m downstream sampling location.

- Attach in triplicate bacteriological sample bottles to sampling pole, remove cap and collect sample
- As quickly as possible remove, the bacteriological bottles from the sampling pole and replace caps.
- Attach in triplicate, 1-Litre sample bottles to sampling pole, remove caps and collect sample
- As quickly as possible remove, the 1-Litre bottles from the sampling pole and replace the caps.
- Attach in triplicate, 250-mL bottles to sampling pole, remove caps and collect sample
- As quickly as possible remove, the 250-mL bottles from the sampling pole and replace the caps.
- Attach 125-mL bottles and 60-mL bottles required in triplicate to sampling pole, remove caps and collect sample
- As quickly as possible remove, the 125-mL and 60-mL bottles from the sampling pole and replace caps.
- Preserve samples bottles as required in the field.

The field blank sample was below detection limit for all nutrients and total metals, except for total molybdenum that was detected at 0.00018 mg/L Mo. The detection limit for total molybdenum is <0.00010 mg/L Mo. The average molybdenum at the Okanagan River 100m downstream site was 0.0034 mg/L Mo; an order of magnitude above the copper detected in the field blank sample. Therefore, the small amount of molybdenum in the field blank is negligible. Database summary of quality control Okanagan River triplicates and field blank samples are in Appendix J.

A set of triplicate samples for Vaseux Lake were collected by Larratt Aquatic on behalf of the Regional District for the 1, 5, and 10 m composite and for the 20, 22 and 24 m composite in July 2021 as seen in Appendix J.

The results of the surface water monitoring program for the 2021 reporting period are presented in Appendices Q to T. The database summaries for the three Okanagan River monitoring sites (Appendix Q) and the Vaseux Lake monitoring (Appendix S) highlight if a guideline was exceeded. Comparisons were made to BC Approved Water Quality Guidelines (BCAWQG), BC Source Drinking Water Quality Guidelines (BC SDWQG), Working Water Quality Guidelines for British Columbia (BCWWQG) and BC CSR, Schedule 3.2, Generic Numerical Water Standards (2017 and updates) (BC CSR). Comparisons to the federal Guidelines for Canadian Drinking Water Quality (GCDWQ) were also made. The water quality exceedances for both Okanagan River and Vaseux Lake are summarized in Table 12 and Table 13 respectively below.

Details regarding the analysis of the Okanagan River samples and the Vaseux Lake samples in relation to the treated effluent discharged from the treatment plant are found in the complete report from Larratt Aquatic Consulting available in Appendix U. This report provides a summary of monthly nutrient loading

for total phosphorus, nitrate and total nitrogen from the discharged effluent. It also trends water quality parameters measured in Okanagan River at all three sites and at Vaseux Lake since 2013 and notes any significant trends over this nine-year period. The taxonomy results from the benthic samples collected from the three Okanagan River sites in October are included in Larratt Aquatics Consulting report as an appendix. A brief overview of the report conclusions are;

- Flow from WWTP effluent and polishing wetland into Okanagan River was only 0.04% of the total flow in Okanagan River measured at Okanagan Falls during 2021.
- A very small fraction of nutrient loadings in Okanagan River and subsequently Vaseux Lake comes from the WWTP; 0.45% total nitrogen and 0.34% total phosphorus in 2021.
- Total nitrogen concentrations, as well as nitrate, decreased from 2013 to 2021 in the effluent.
- Total phosphorus have been stable since 2014, averaging 0.143 ± 0.039 mg/L P in 2021.
- The wetland was highly effective at reducing both nitrogen and phosphorus concentrations from a TN of 3.37 ± 1.11 mg/L as N in WWTP effluent to 0.92 ± 0.22 mg/L as N from the wetland discharge and from a TP of 0.143 ± 0.039 mg/L P in WWTP effluent to 0.055 ± 0.035 mg/L P from the wetland discharge in 2021.
- There was no statistically significant difference between samples taken upstream and downstream of the WWTP for any forms of nitrogen and phosphorus from 2013 to 2020.
- Both chloride and conductivity show subtle increases in downstream samples compared to upstream samples, even though differences were not statistically significant.
- Fecal and E. coli in effluent samples contained very low counts, with 83% of samples having undetectable E. coli in 2021.
- The wetland was a net source of fecal bacteria into Okanagan River averaging 78 ± 251 CFU.
- The benthic invertebrate data indicate Okanagan River is not a healthy water body and the WWTP may be impacting benthic invertebrates in some years with regards to species richness. However upstream impacts appear to play a larger role.

Trends in Vaseux Lake in relationship to the WWTP effluent as noted in Report in Appendix U are as follows:

- Sampling of Vaseux Lake since 2013 has not detected a significant WWTP impact on Vaseux Lake water chemistry.
- Algae trends identified to date appear to be climate-driven and there were no indications of nutrient enrichment or other impacts by the WWTP on Vaseux Lake's algae population from 2013 to 2021.

Recommendations are to continue with the monitoring program in 2022. More years of study will be required to determine conclusively if there are impacts on Okanagan River benthic invertebrate community from the WWTP.

Table 12 Summary of 2021 Water Quality Exceedances in Okanagan River

Sampling Location	Guideline ¹	Exceedances ²
Okanagan River Channel 100m Upstream	BCAWQG AL (ST)	Temperature [F]
	BCAWQG AL (LT)	Dissolved oxygen [F]
	BCWWQG AL	Chromium (total)
	BCWWQG I	Chromium (total)
	GCDWQ MAC	E. coli (MPN), Fecal coliforms (MPN)
	GCDWQ AO	Aluminum (total), Manganese (total), Temperature [F]
	BC SDWQG MAC	E. coli (MPN), Fecal coliforms (MPN)
	BC SDWQG AO	Temperature [F], Manganese (total)
	BC CSR IW	Chromium (total)
Okanagan River Channel 100m Downstream	BCAWQG AL (ST)	Temperature [F]
	BCAWQG AL (LT)	Dissolved oxygen [F], Temperature [F]
	BCWWQG AL	Chromium (total)
	GCDWQ MAC	E. coli (MPN), Fecal coliforms (MPN)
	GCDWQ AO	Aluminum (total), Iron (total), Manganese (total), Temperature [F]
	BC SDWQG MAC	E. coli (MPN), Fecal coliforms (MPN)
	BC SDWQG AO	Iron (total), Manganese (total), Temperature [F]
Okanagan River Channel 500m Downstream	BCAWQG AL (ST)	Temperature [F]
	BCAWQG AL (LT)	Dissolved oxygen [F]
	BCWWQG AL	Chromium (total)
	BCWWQG I	Chromium (total)
	GCDWQ MAC	E. coli (MPN), Fecal coliforms (MPN)
	GCDWQ AO	Aluminum (total), Iron (total), Manganese (total), Temperature [F]
	BC SDWQG MAC	E. coli (MPN), Fecal coliforms (MPN)
	BC SDWQG AO	Iron (total), Manganese (total), Temperature [F]
BC CSR IW	Chromium (total)	

- BCAWQG AL (ST) = BC Approved Water Quality Guidelines for freshwater aquatic life (Short-term acute)
 BCAWQG AL (LT) = BC Approved Water Quality Guidelines for freshwater aquatic life (Long-term chronic)
 BC CSR IW = BC CSR, Schedule 3.2, Generic Numerical Water Standards for Irrigation (2017 and updates)
 BC SDWQG MAC = BC Source Drinking Water Quality Guidelines - Maximum Acceptable Concentrations (2017 and updates)
 BC SDWQG AO = BC Source Drinking Water Quality Guidelines - Aesthetic Objectives (2017 and updates)
 BCWWQG AL = Working Water Quality Guidelines for British Columbia for freshwater aquatic life
 BCWWQG I = Working Water Quality Guidelines for British Columbia for irrigation
 GCDWQ MAC = Guidelines for Canadian Drinking Water Quality Maximum Acceptable Concentrations
 GCDWQ AO = Guidelines for Canadian Drinking Water Quality Aesthetic Objectives

- [F] = Field Result(s)

Table 13 Summary of 2021 Water Quality Exceedances in Vaseux Lake

Sampling Location	Guideline ¹	Exceedances ²
Vaseux Lake 1, 5, 10 m composite	BCAWQG AL (ST)	Temperature [F]
	BCAWQG AL (LT)	Dissolved oxygen [F]
	GCDWQ AO	Manganese (total), Temperature [F]
	BC SDWQG AO	Manganese (total), Temperature [F]
Vaseux Lake 20, 22, 24 m composite	BCAWQG AL (ST)	Dissolved oxygen [F]
	BCAWQG AL (LT)	Dissolved oxygen [F]
	GCDWQ MAC	Manganese (total)
	GCDWQ AO	Iron (total), Manganese (total)
	BCWWQG I	Manganese (total)
	BC SDWQG MAC	Manganese (total)
	BC SDWQG AO	Iron (total), Manganese (total)
	BC CSR IW	Manganese (total)

1. BCAWQG AL (ST) = BC Approved Water Quality Guidelines for freshwater aquatic life (Short-term acute)
 BCAWQG AL (LT) = BC Approved Water Quality Guidelines for freshwater aquatic life (Long-term chronic)
 BC CSR IW = BC CSR, Schedule 3.2, Generic Numerical Water Standards for Irrigation (2017 and updates)
 BC SDWQG MAC = BC Source Drinking Water Quality Guidelines - Maximum Acceptable Concentrations (2017 and updates)
 BC SDWQG AO = BC Source Drinking Water Quality Guidelines - Aesthetic Objectives (2017 and updates)
 BCWWQG AL = Working Water Quality Guidelines for British Columbia for freshwater aquatic life
 BCWWQG I = Working Water Quality Guidelines for British Columbia for irrigation
 GCDWQ MAC = Guidelines for Canadian Drinking Water Quality Maximum Acceptable Concentrations
 GCDWQ AO = Guidelines for Canadian Drinking Water Quality Aesthetic Objectives
2. [F] = Field Result(s)

5. FACILITY OPERATIONS AND MAINTENANCE

The Okanagan Falls Wastewater Treatment Facility consists of four lift stations, forcemains, gravity mains, and Level IV biological nutrient removal plant with an outfall diffuser into Okanagan River.

Operations staff continued to implement process changes to facilitate more stable effluent throughout the year. The 2021 results are again within the Total Nitrogen and Total Phosphorus annual average. Several process changes has resulted in further reduction of both parameters. This year saw the utilization of two bioreactors for the summer season that allowed for the process to better adjust to higher flows in peak summer vacation residents.

Preventative maintenance program continues with emphasis on equipment replacement. Several quotes were obtained in 2021 for an asset management plan for the RDOS. Implementation of this program is awaiting integration of all RDOS assets.

With age, equipment is being replaced within the collection system and the treatment plant. CCTV camera work in fall of 2021 shows that some piping in the 1970's part of town has degraded such that replacement

will be needed in 2022. Budget requests have been submitted for this work. \$23,000 was spent on Lift Station 3 infrastructure replacement as well as electronic monitoring equipment (see Section 5.4). The RDOS has service level agreements with several outside contractors to maintain equipment for HVAC, electrical, and instrumentation. With age of the facility comes the need to budget for replacement equipment in the future. Budgets are being forecast over the next few years to allocate monies for asset management.

The summer of 2021 saw the full seasonal use of the polishing wetland. This initiative was part of the original plan of the WWTP and the RDOS retained Ducks Unlimited Canada, operating as Native Plant Solutions, to design the constructed wetland that will receive treated effluent for additional polishing prior to discharge to the Okanagan River. The wetland is located within species habitat that are red and blue listed including the western painted turtle, yellow breasted chat, tiger salamander and great basin spadefoot. With the wetland fully operational, there was a reduction in nutrient levels and loadings being discharged into the Okanagan river system (see Section 3.4). Appendix M and N provides tabulated data and individual laboratory reports respectively. Following direction provided by Native Plant Solutions to RDOS staff,

- accumulation of winter (December 1, 2020 to February 28, 2021) precipitation and groundwater was drained March 1, 2021 to just below the level of the sand filter to in anticipation of any spring rainfall events and in preparation of discharging effluent in to the constructed wetland in May;
- if water levels in the wetland rose above the sand filter stop logs and/or the level on top of the sand filter rose too high, discharge into the wetland was either stopped or reduce until water levels in the sand filter returned a returned to operational levels;
- sand filter maintenance of removing the top layer of sand and installing perforated piping within the sand filter was tried to prevent the build of water on top of the sand filter. discourage growth of reed canary grass, an invasive species which could outcompete cattail; and
- healthy establishment of cattail at end of first year growing season.

Operational staff in 2021 and their Environmental Operators Certification Program (EOCP) of BC certification, as required by Section 2.8.2 of OC 10655 are summarized in Table 14 below.

Table 14 Operational Staff in 2021

Name	RDOS Position Title	EOCP Certification
Rina Seppen	Utilities Foreman	Municipal Wastewater Treatment Level IV Wastewater Collection Level II
Steve Anderson	Systems Operator IV	Municipal Wastewater Treatment Level IV Wastewater Collection Level I
Karen Moore	Lab Technician	Municipal Wastewater Treatment Level III

5.1 SLUDGE MANAGEMENT PLAN

The Fermented Primary Sludge (FPS) is thickened as it ferments and settles in the primary clarifier. Dissolved Air Floatation (DAF) thickens Waste Activated Sludge (WAS) from the bioreactor. Both thickened sludges are held in storage vaults until they are pumped out and hauled to the Penticton Advanced Wastewater Treatment Plant for further processing.

The FPS sludge was received at Penticton’s Septic Waste Receiving Facility and the TWAS sludge was received into a holding tank directly for processing by their dewatering equipment. The volume of sludge delivered and the density of each delivery is measured at City of Penticton’s AWWTP and this data is provided monthly to RDOS for billing purposes. A monthly summary of sludge disposed of at City of Penticton’s AWWTP in 2021, is presented in Appendix F, while Table 15 provides a yearly summary of the sludge disposed of in 2021, 2020 and 2019. As illustrated in Table 15 below, FPS disposed of in 2021 was above that in 2020, but less than 2019. In 2019, the volume of FPS disposed of was higher because of the need to remove primary effluent liquid and FPS solids from the fermented primary sludge tank to allow for repair of a broken weld on the raking mechanism in this tank. The average FPS percent total solids in 2021 was lower than both 2020 and 2019 values. The TWAS percent total solids and the dry weight disposed of was lower in 2021 compared to the two previous years.

With the assistance of grant money from the Province, the RDOS purchased a centrifuge in 2020 and construction began on a dewatering system in 2021 to eliminate the costs associated with hauling and disposing of liquid sludge to the AWWTP in Penticton. Delays in supply chain and manufacturing pushed back the start date for the centrifuge commissioning from fall 2021 to spring 2022.

A biosolids agreement with the City of Penticton Composting Facility at Campbell Mountain Landfill has been drafted to have the biosolids from the new OK Falls Dewatering accepted when the centrifuge is commissioned.

Table 15 Summary of TWAS and FPS Sludge hauled offsite

	2021		2020		2019	
	Average	Total	Average	Total	Average	Total.
FPS						
Total solids, %	5.0		5.5		5.8	
Volume, m ³	13.0	156.3	14.0	126.0	18.2	218.3
Dry Weight, kg	728.5	8742.3	748.1	6733	979.4	11752.4
TWAS						
Total solids, %	2.4		2.7		2.8	
Volume, m ³	118.8	1426.0	109.2	1309.9	106.7	1280.8
Dry Weight, kg	2911.1	34,933	2937	35244	3052.7	36632.0

5.2 SEWERAGE REGULATION BYLAW

In 2021, the Sewerage Regulation Bylaw No. 1707, 1996 has not been amended. The Sewer Bylaw is planned to be reviewed in 2022.

5.3 CONTINGENCY PLAN

In 2021, revisions were made to the Emergency Response and Contingency Plan for the Okanagan Falls Wastewater Collection and Treatment System (Appendix V) to include the new polishing treatment wetland contingency plans.

5.4 OPERATION AND MAINTENANCE EXPENDITURES

The annual operation costs for the Facility during the reporting period was \$973,184 plus \$1,268,609 for the dewatering project (Total expenses less Depreciation, Debt Interest, Debt Principal, Transfer to Reserve and Transfer Interest to Reserves). The 2021 annual budget was \$ 3,071,484 (Total expenses less Depreciation, Debt Interest, Debt Principal, Transfer to Reserve and Transfer Interest to Reserves). These costs include the site operations labour, and other ancillary expenses. The major project of the construction of the new Solids Processing Facility (dewatering project) with Provincial Grant money for the purchase of the new centrifuge and construction costs will be completed in 2022.

The RDOS also hired a consultant in 2021 to complete an energy efficiency study for the WWTP in co-operation with Fortis BC. This energy study, at the cost of \$31,900, was completed by Prism Engineering that would identify aspects of the wastewater treatment plant equipment that could be eligible for Fortis rebates with optimization. The study was completed in 2021 and submitted to Fortis for evaluation. Fortis offers 100% cost of the study to be reimbursed to RDOS with the implementation of any aspect identified as well as various rebates on new equipment and/or changes to process that will result in energy savings. A total of \$40,484 incentives are available that would result in an annual electricity 135, 800 kWh/yr. The RDOS has purchased a Nikuni recirculation pump to replace the older Dissolved Air Flotation pump; an incentive identified in the study and will be installing it in early 2022.

Supply chain issues and rapid rising costs from suppliers toward the end of the year has created an inflationary increase in the cost of consumables and parts (noted mostly in the cost of chemicals and environmental monitoring) and will continue into 2022. Construction was completed on Lift Station 3 in October 2021 (which had seen a failure and subsequent spill in 2020) with upgrades to the electronic monitoring system as well as infrastructure replacement. A summary of the budgetary information for the Okanagan Falls BNR WWTF during the reporting period is presented in Table 16.

Table 16 Summary of 2021 OKFWWTP Budget

Financial Summary		2021 Year Actual	2021 Annual Budget	2021 Variance	2020 Year Actual
Revenue:					
4-1-3800-2955	GAS TAX	1,268,609	1,731,687	(463,078)	18,8033
4-1-3800-2915	COMMUNITY WORKS GAS TAX		142,955	(142,955)	
4-1-3800-4500	USER FEES	1,162,875	940,555	222,320	1,090,858
4-1-3800-4510	CONNECTION & EXTENSION FEES	3,500	3,500		1,050
4-1-3800-4520	NEW SERVICES INSTALLATION FEES		250	(250)	
4-1-3800-4570	USER FEES - CAPITAL		239,366	(239,366)	
4-1-3800-6000	TRANSFER FROM RESERVE		50,000	(50,000)	
4-1-3800-6290	TRANSFER FROM OPERATING RESERVE		1,431	(1,431)	
4-1-3800-8510	OBWB GRANT - DEBENTURE	80,227	80,226	1	80,227
4-1-3800-9000	MISCELLANEOUS REVENUE	23,925		23,925	146
4-1-3800-8900	CLEAN WATER & WW FUND GRANT				
4-1-3800-9990	PRIOR YEARS SURPLUS		(34,828)	34,828	(91,357)
	Total Revenue	2,539,136	3,155,142	(616,006)	1,679,426
Expenses:					
4-2-3800-1000	SALARIES & WAGES	357,973	324,675	33,298	353,363
4-2-3800-1400	ADMINISTRATION CHARGES	41,801	41,801	0	35,064
4-2-3800-1500	IS	0	0	0	11,039
4-2-3800-2500	OPERATIONS	21,560	42,000	(20,440)	22,110
4-2-3800-2501	SEWER FLUSHING	20,745	30,000	(9,255)	
4-2-3800-2502	MAINTENANCE AND PARTS	91,714	74,100	17,614	96,801
4-2-3800-2503	CHEMICALS	8,438	7,054	1,384	7,124
4-2-3800-2505	OPS – SLUDGE HAULING	64,833	60,000	4,833	63,519
4-2-3800-2506	OPS – SLUDGE DISPOSAL	90,648	75,000	15,648	88,962
4-2-3800-2595	OP - ENVIRONMENTAL MONITORING	20,879	11,000	9,879	18,383
4-2-3800-2596	OUTSIDE LAB	26,031	25,750	281	27,896
4-2-3800-2597	INHOUSE LAB	15,465	17,000	(1,535)	17,358
4-2-3800-2640	OPERATIONS - HEALTH & SAFETY	1,822	4,000	(2,178)	4,564
4-2-3800-2960	OK WWTP SOLIDS PROCESSING	1,268,609	1,805,284	(536,675)	188,040
4-2-3800-2961	OK FALLS WETLAND ENHANCEMENT	44,299	25,438	18,861	124,944
4-2-3800-3000	CONSULTANTS	39,106	5,000	34,106	6,039
4-2-3800-4000	EDUCATION & TRAINING	2,202	3,000	(798)	1,026
4-2-3800-5400	DEPRECIATION		3000	(3000)	5,000
4-2-3800-5500	CAPITAL EXPENDITURES	22,830	45,942	(22,113)	41,818
4-2-3800-6000	INSURANCE - PROPERTY	13,335	7,779	5,556	7,907
4-2-3800-6050	INSURANCE - LIABILITY	16,864	21,304	(4,440)	16,422
4-2-3800-6150	INSURANCE - ENVIRONMENTAL	14,475	6,759	7,716	7,247
4-2-3800-6200	LEGAL FEES	1,782	500	1,282	
4-2-3800-7000	SUPPLIES	117		117	29
4-2-3800-8200	TRAVEL/LEASING	15,937	10,516	5,421	13,470
4-2-3800-8500	UTILITIES	82,226	80,000	2,226	77,386
4-2-3800-9010	DEBT INTEREST	158,400	158,400	0	158,400
4-2-3800-9020	DEBT PRINCIPAL	161,192	161,192	0	161,192
4-2-3800-9200	TRANSFER TO RESERVE		20,000	(20,000)	
4-2-3800-9205	TRANSFER INTEREST TO RESERVES		5,000	(5,000)	5,000
	Total Expenses	2,603,283	3,071,494	(468,211)	1,555,103

6. CONCLUSIONS

The ninth year of operation of the Okanagan Falls Biological Nutrient Removal Wastewater Treatment Facility has shown a steady improvement in the quality of effluent discharged to the Okanagan River in terms of nutrient loadings. There were no exceedances of the permitted effluent parameters in 2021 for the OK Falls WWTP. There are continuous maintenance issues that arise as is indicative of the age of the treatment plant and the sewer system. Adjustments to the maintenance budget and preventative maintenance program will be made for 2022 to reflect the need to upgrade the system.

The construction phase of the wetland project was completed in spring of 2020 with the commissioning phase of cattail establishment continuing throughout 2021. Final effluent was periodically diverted (80,639.2 m³) to the wetland between May 10 and October 29 with discharge (47,947.9 m³) to the Okanagan River occurring between March 1 and November 30. Overall, use of the wetland in 2021 reduced discharges to the Okanagan River by a net volume of 32,691.3 m³. The addition of this polishing treatment process has the ability to reduce nutrient loadings into Okanagan River, to increase habitat for threatened species in the area, as well as to promote the removal of endocrine disrupters in the water.

The report from Larratt Aquatic Consulting has indicated from 2013-2021 there were no statistical differences between upstream and downstream nutrients levels in Okanagan River. However, there appears to be subtle increases in chloride and conductivity in Okanagan River downstream of the WWTP, but not at a statistically significant level. The benthic invertebrate data indicate Okanagan River is not a healthy water body and the WWTP may be impacting benthic invertebrates in some years with regards to species richness. However upstream impacts appear to play a larger role. No observed impacts from the WWTP operation on Vaseux Lake chemistry and biology. Algae trends in Vaseux Lake identified to date appear to be climate-driven and there were no indications of nutrient enrichment or other impacts by the WWTP on Vaseux Lake's algae population from 2013 to 2021 data.

7. RECOMMENDATIONS

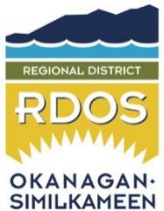
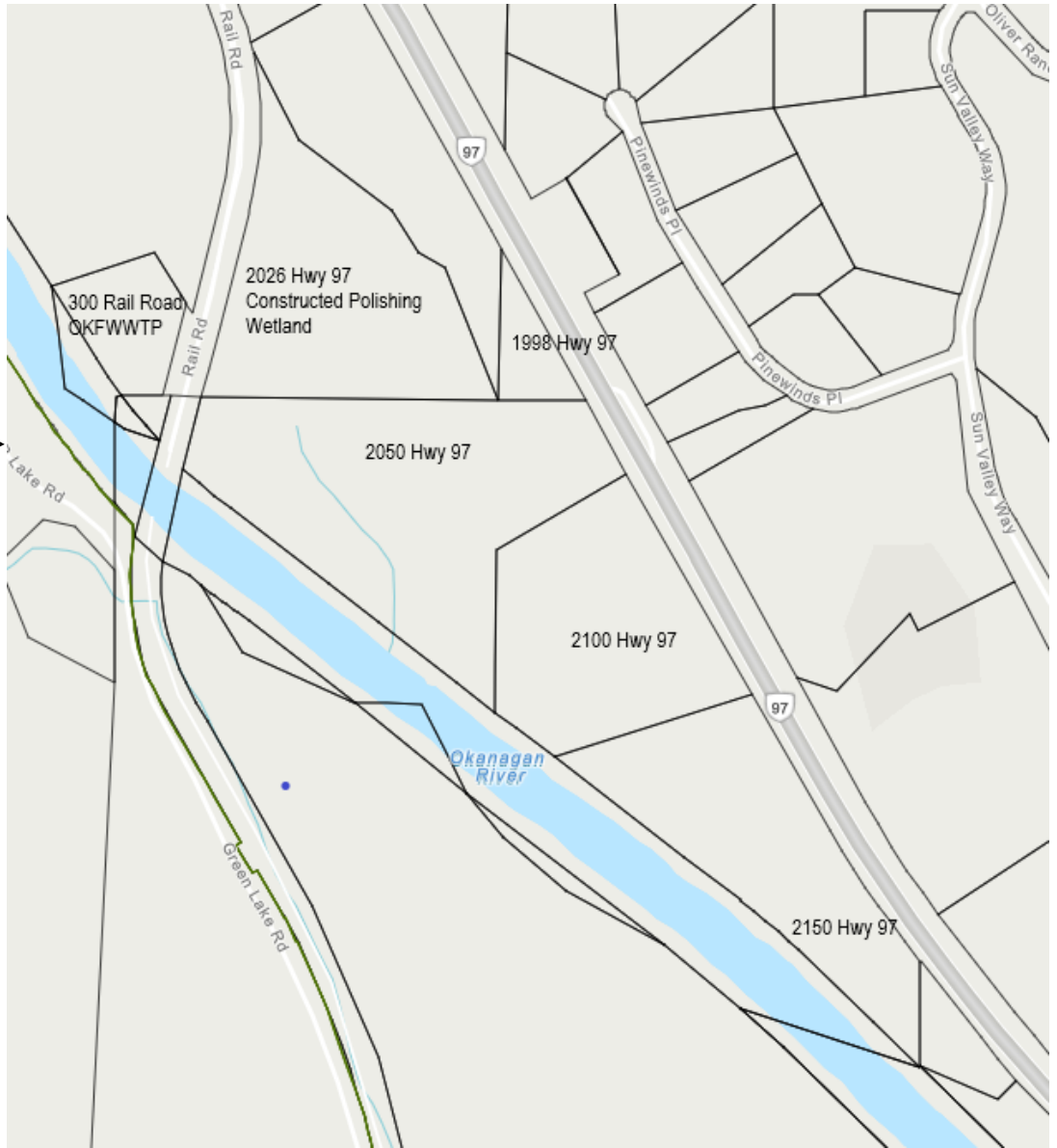
Based on the results of the 2020 monitoring program, the following recommendations are provided:

1. Review the monitoring program on an annual basis to accommodate changes in Facility conditions and monitoring program results.

8. REFERENCES

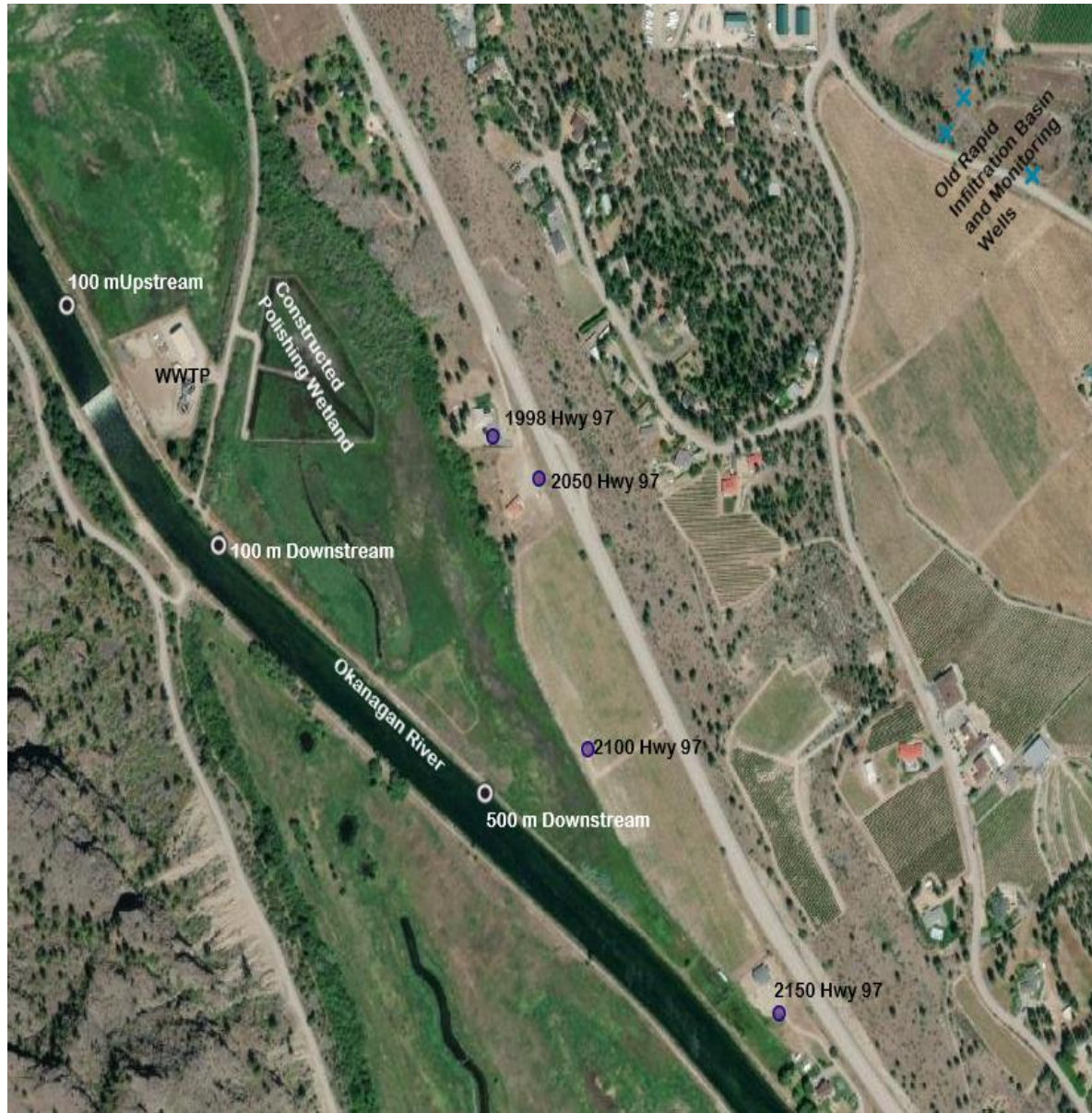
1. Environment Canada, Water Office – 2021 daily mean discharge for Station 08NM002 was received January 12, 2022 via email from National Hydrological Services Meteorological Service of Canada Branch Environment and Climate Change Canada/Government of Canada.
2. Ernst, T. (2008) *Fishing Mapbook Southeastern BC Region 4: Kootenay, Region 8: Okanagan*, 1st Edition. Backroad Mapbooks, Mussio Ventures Ltd

FIGURES



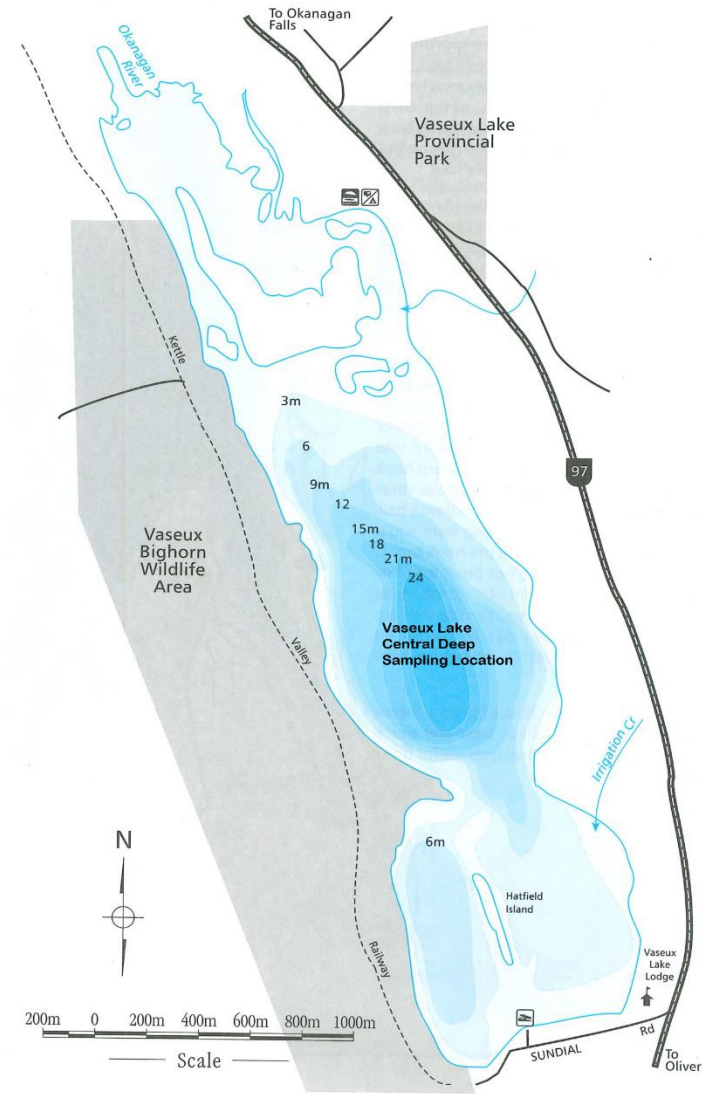
REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

FIGURE I: SITE LOCATIONS AND PARCEL MAP



REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

FIGURE 2: OKANAGAN RIVER AND GROUNDWATER WELLS SAMPLING LOCATIONS

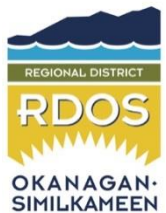
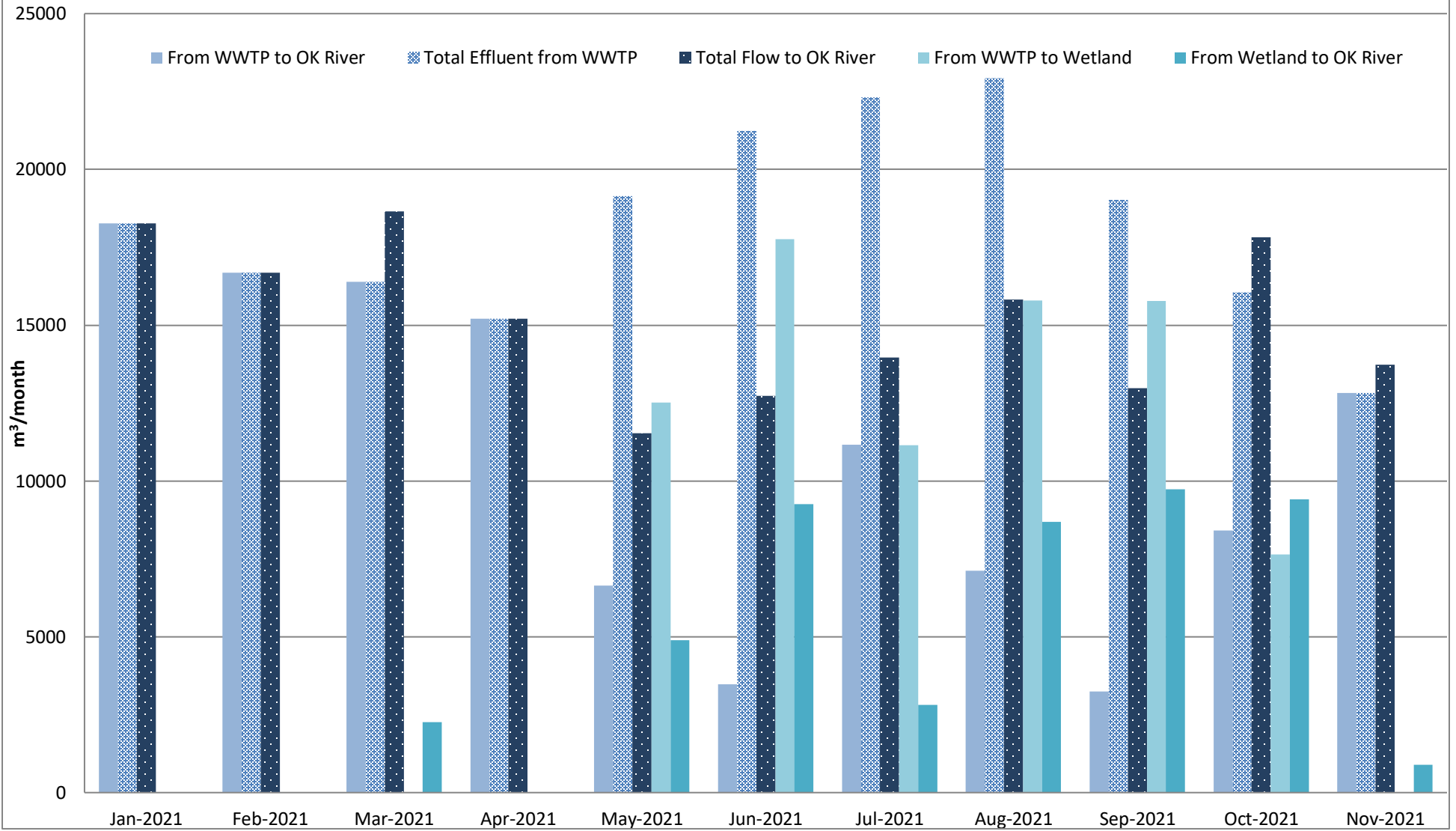


REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

FIGURE 3: VASEUX LAKE SAMPLING LOCATION

Bathymetry Map from: Ernst, T. (2008), *Fishing Mapbook Southeastern BC Region 4: Kootenay, Region 8: Okanagan*, 1st Edition. (p. 164)
 Backroad Mapbooks, Mussio Ventures Ltd.

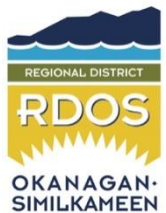
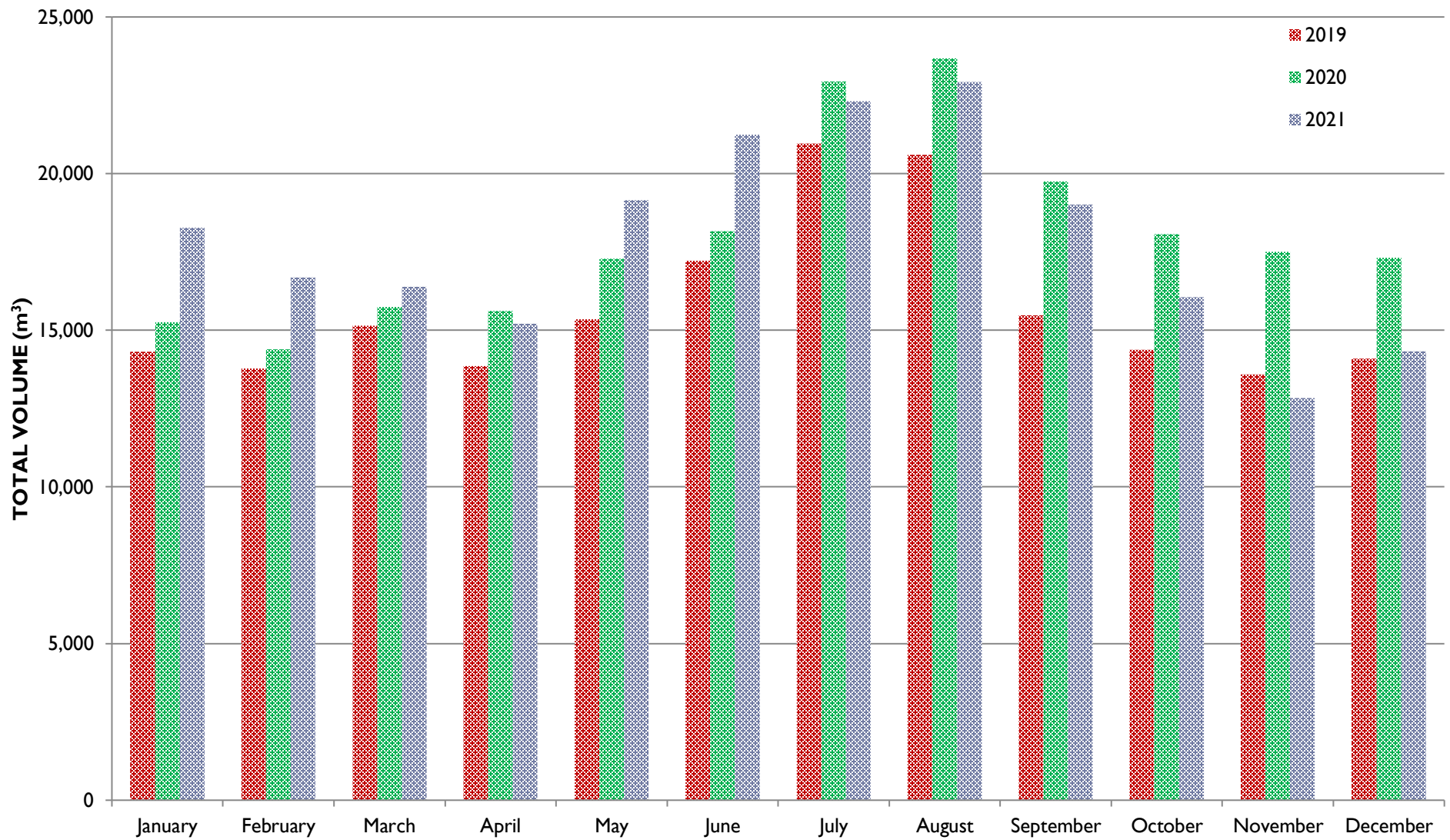
MONTHLY EFFLUENT AND WETLAND FLOWS



REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

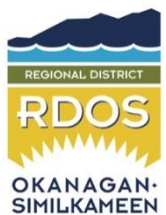
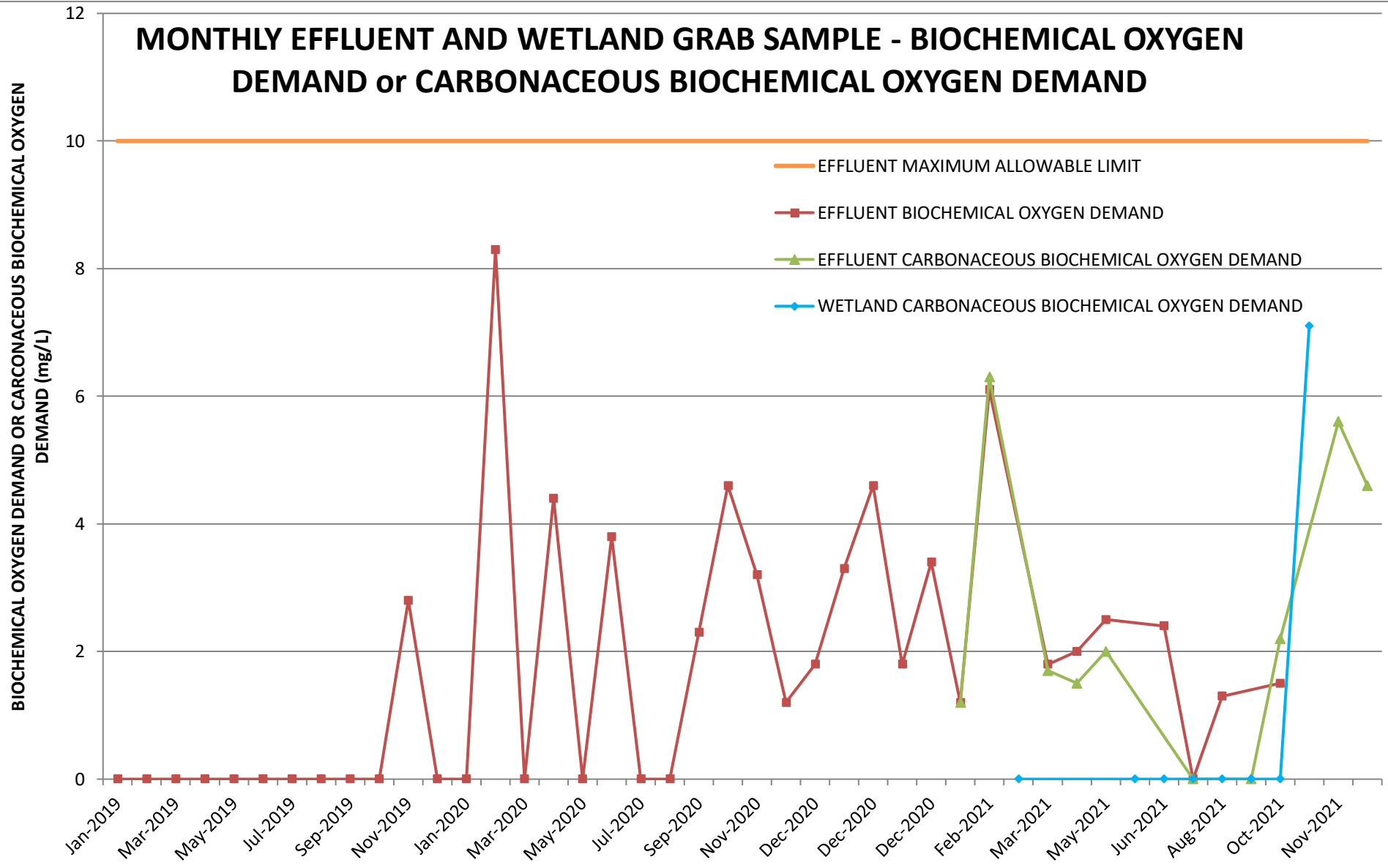
FIGURE 4: MONTHLY EFFLUENT AND WETLAND FLOWS 2021

MONTHLY EFFLUENT FLOWS FROM WWTP



REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

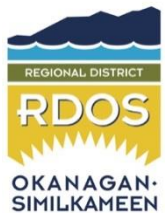
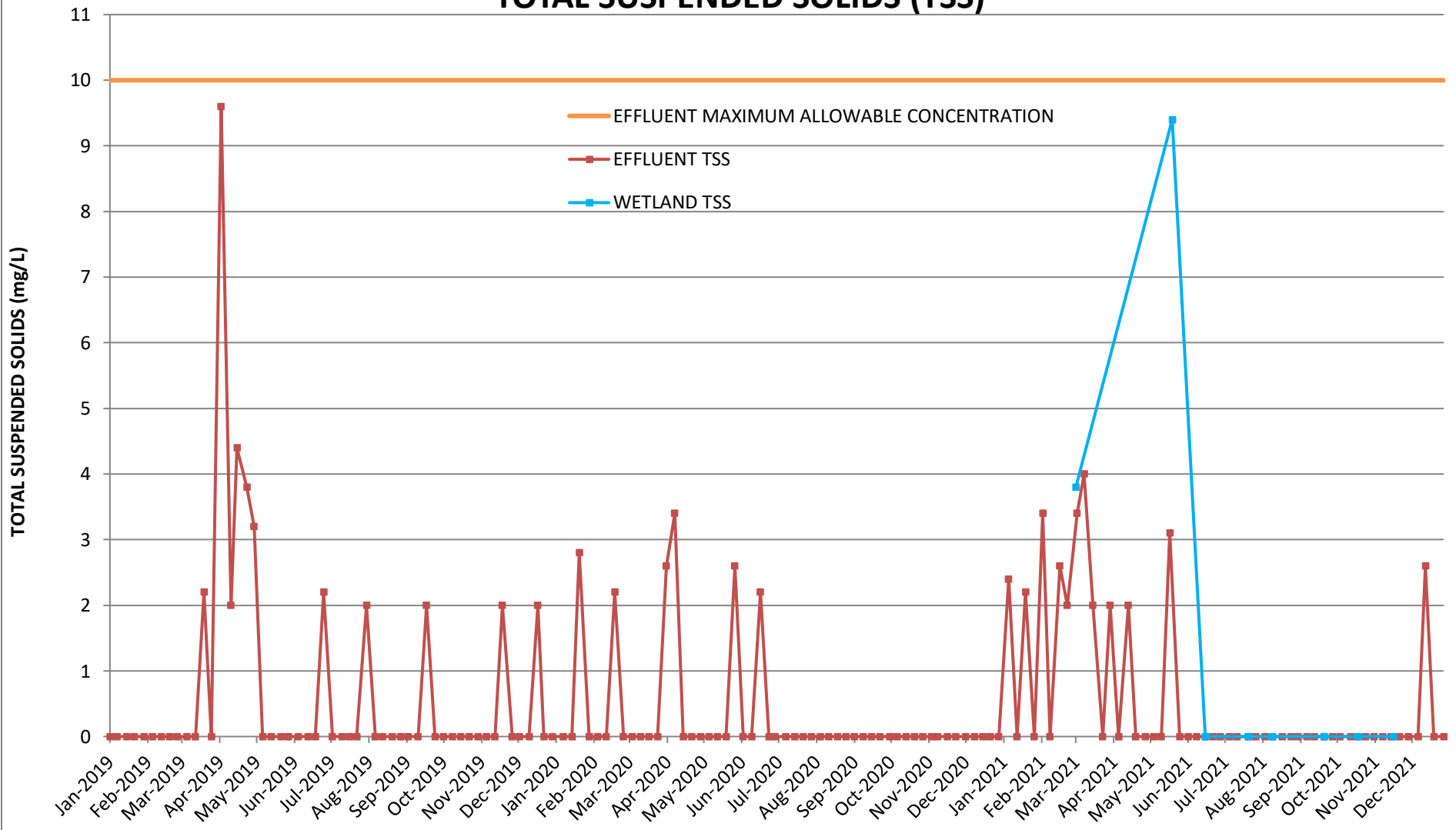
FIGURE 5: MONTHLY EFFLUENT FLOWS AFTER DISINFECTION 2019 TO 2021



REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

FIGURE 6: MONTHLY EFFLUENT AND WETLAND BIOCHEMICAL OXYGEN DEMAND OR CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND TIME SERIES PLOT

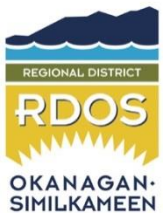
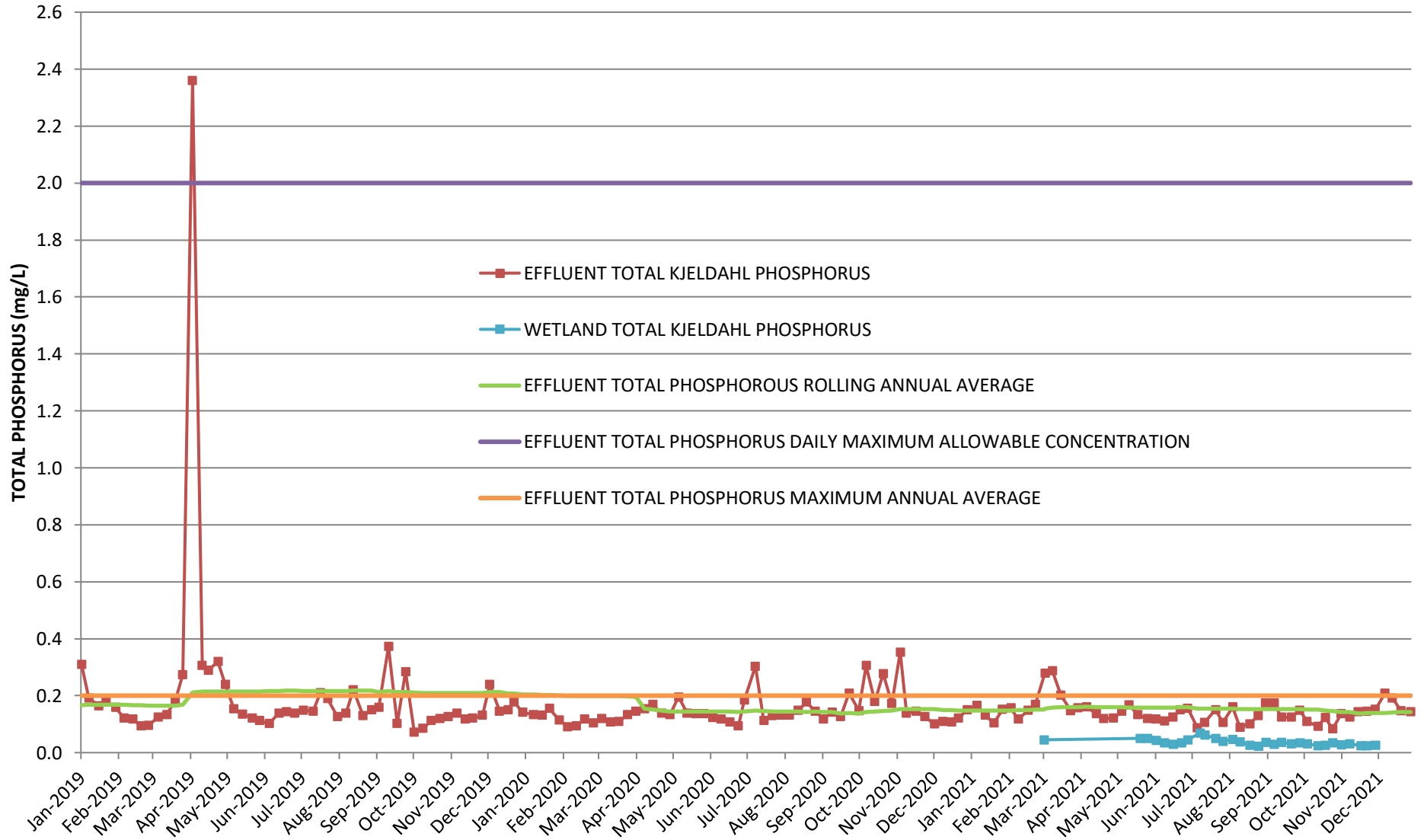
WEEKLY EFFLUENT AND MONTHLY WETLAND GRAB SAMPLE TOTAL SUSPENDED SOLIDS (TSS)



REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

FIGURE 7: WEEKLY EFFLUENT AND MONTHLY WETLAND TOTAL SUSPENDED SOLIDS TIME SERIES PLOT

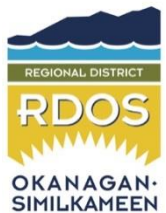
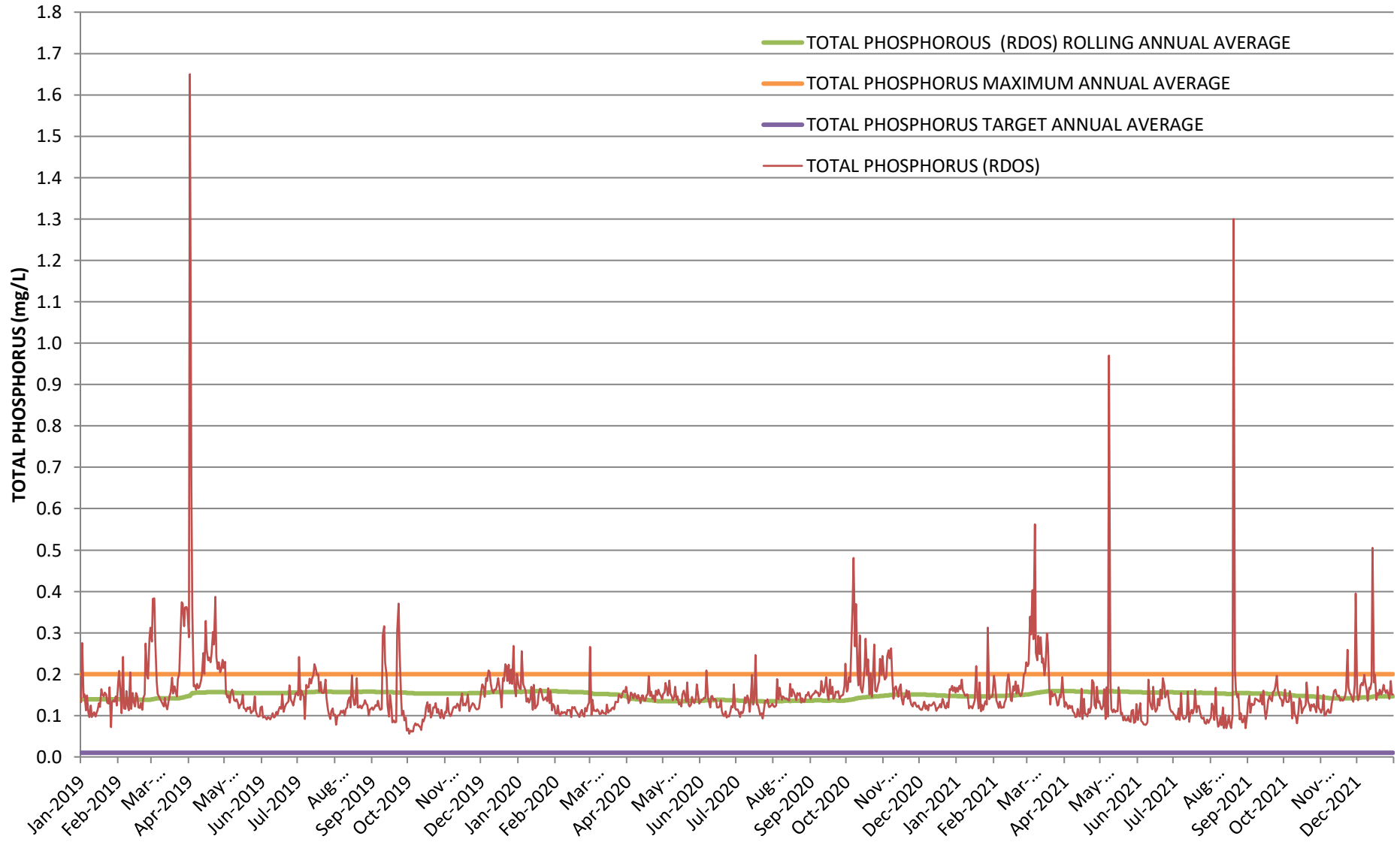
WEEKLY EFFLUENT AND WETLAND GRAB SAMPLE - TOTAL PHOSPHORUS



REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

FIGURE 8: WEEKLY EFFLUENT AND WETLAND TOTAL PHOSPHORUS TIME SERIES PLOT

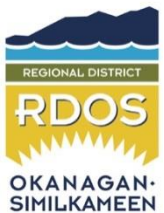
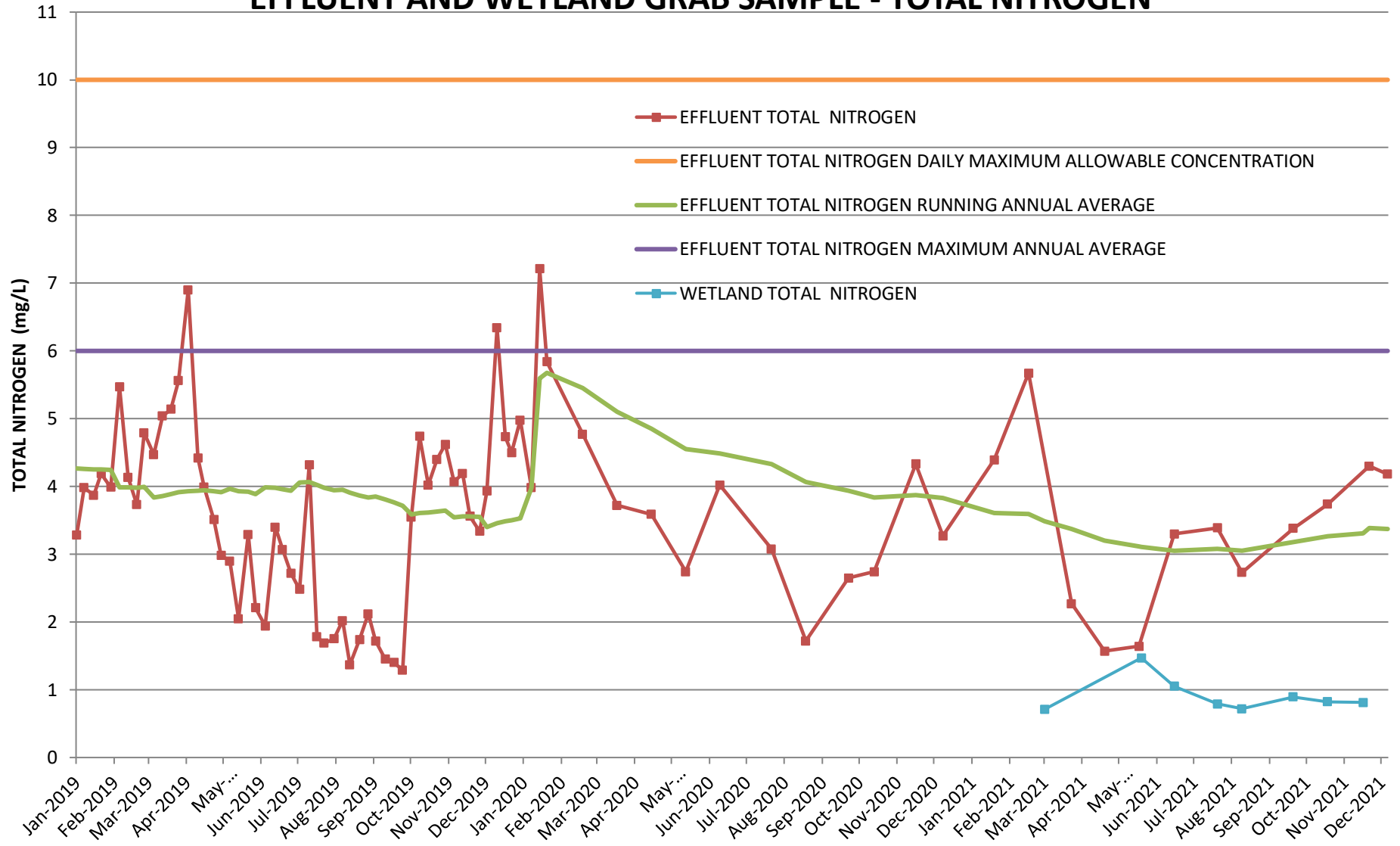
DAILY EFFLUENT COMPOSITE SAMPLE - TOTAL PHOSPHORUS



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FIGURE 9: DAILY EFFLUENT COMPOSITE TOTAL PHOSPHORUS TIME SERIES PLOT

EFFLUENT AND WETLAND GRAB SAMPLE - TOTAL NITROGEN

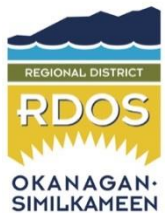
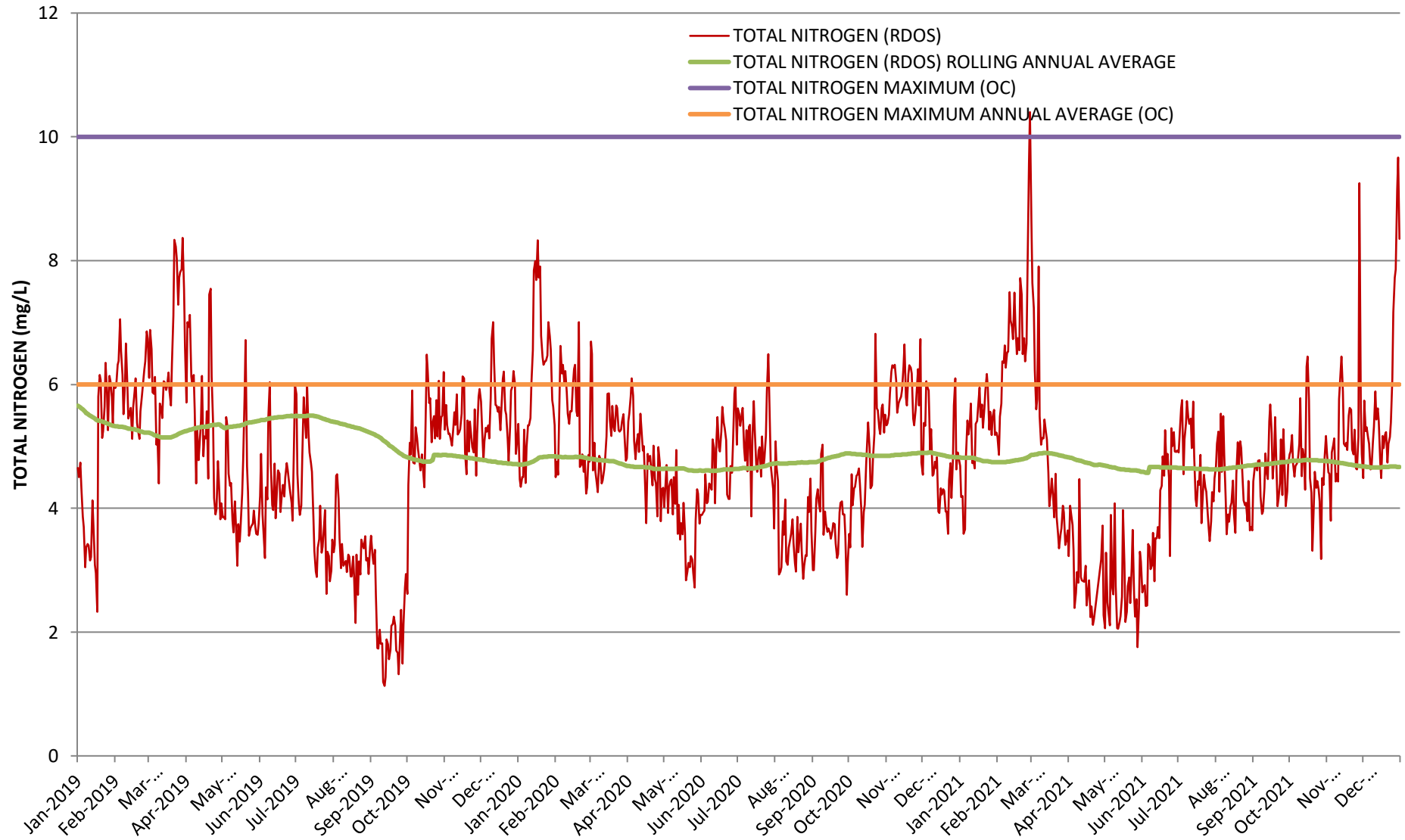


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FIGURE 10: EFFLUENT AND WETLAND TOTAL NITROGEN TIME SERIES PLOT

DATE: APRIL 2021

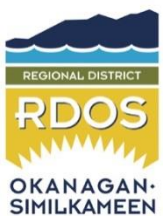
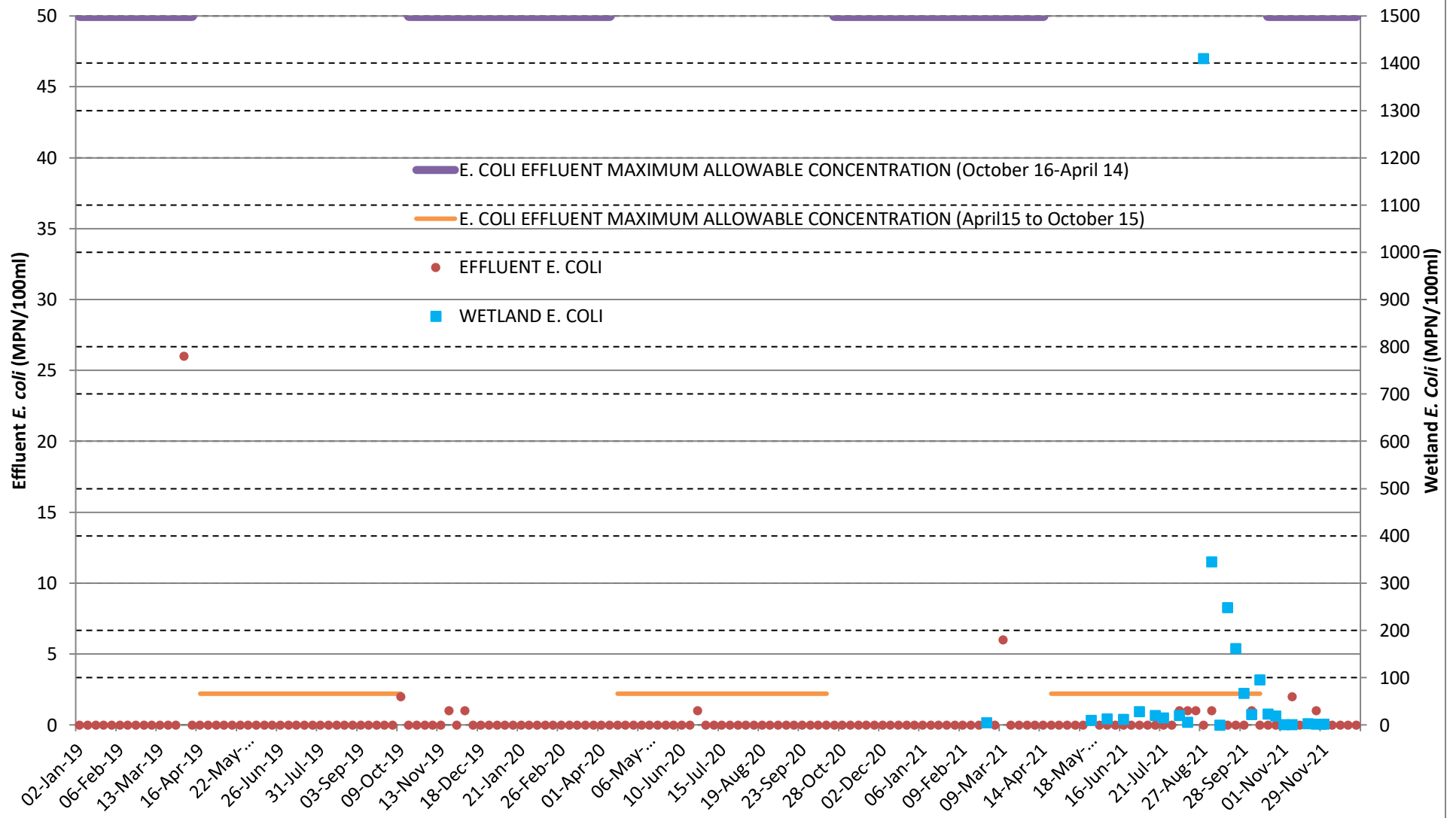
DAILY EFFLUENT COMPOSITE SAMPLE - TOTAL NITROGEN



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FIGURE 11: DAILY EFFLUENT COMPOSITE TOTAL NITROGEN TIME SERIES PLOT

WEEKLY EFFLUENT AND WETLAND GRAB SAMPLE - *E. COLI*



REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

FIGURE 12: WEEKLY EFFLUENT AND WETLAND *E. COLI* TIME SERIES PLOT

APPENDIX A

Operational Certificate OC 106555

Okanagan Falls
Biological Nutrient Removal
Wastewater Treatment Facility
And Polishing Wetland



May 10, 2021

Tracking Number: 376539
Authorization Number: 106555

REGISTERED MAIL

Regional District Okanagan-Similkameen
101 Martin Street
Penticton, BC V2A 5J9

Dear Operational Certificate Holder:

Enclosed is Operational Certificate (OC) 106555 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the requirements outlined in the OC. An annual fee will be determined according to the Permit and Approval Fees and Charges Regulation.

This OC does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the OC holder. It is also the responsibility of the OC holder to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties and comply with other applicable legislation that may be in force.

The operational certificate holder must immediately report all spills to the environment (as defined in the Spill Reporting Regulation) in accordance with the Spill Reporting Regulation, which among other things, requires notification to Emergency Management BC at 1-800-663-3456.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Administration of this OC will be carried out by staff from the Environmental Protection Division's Regional Operations Branch. Plans, data and reports pertinent to the OC are to be submitted by email or electronic transfer to the Director, designated Officer, or as further instructed.

Yours truly,

Liz Archibald, B.Sc.
for Director, *Environmental Management Act*
Authorizations – South Region



**MINISTRY OF ENVIRONMENT
AND CLIMATE CHANGE
STRATEGY**

OPERATIONAL CERTIFICATE

106555

Under the Provisions of the *Environmental Management Act* and in accordance with the approved Regional District of Okanagan-Similkameen Okanagan Falls Area Liquid Waste Management Plan, the

**REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN
101 MARTIN STREET
PENTICTON, BC V2A 5J9**

is authorized to discharge municipal effluent from a municipal wastewater collection and treatment system located in Okanagan Falls, British Columbia, to the Okanagan River channel, and reclaimed water to the ground by irrigation, and is further authorized to discharge sludge from this same system to an authorized compost facility, subject to the requirements listed below. Contravention of any of these requirements is a violation of the *Environmental Management Act* and may result in prosecution.

1. AUTHORIZED DISCHARGES

1.1 Authorized Discharge to Okanagan River

This section applies to the discharge of effluent from the Okanagan Falls Advanced Wastewater Treatment Plant (AWWTP) to the Okanagan River channel. The EMS site reference number for this discharge is E292449 as shown on Site Plan B.

- 1.1.1 The maximum rate of effluent, to be discharged from the AWWTP, after disinfection, directly to the Okanagan River channel (not including effluent diverted to the wetland) is as follows:

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Year	Maximum Daily Flow (m ³ /d)		
	Okanagan Falls	Skaha Estates	Kaleden Lakeshore
2021	2251	525	412
2022	2307	536	421
2023	2365	552	433
2024	2424	567	445
2025	2485	582	457
2026	2547	598	469
2027	2610	613	482
2028	2676	628	494
2029	2743	644	506
2030	2811	659	518
2031	2881	674	530
2032	2954	689	542
2033	3027	709	557
2034	3103	728	572
2035+	3181	747	587

It is anticipated that sewer collection systems extending to the Skaha Lake Estates and Kaleden Lakeshore areas will be constructed and connected to the Okanagan Falls AWWTP. The maximum rate of effluent from the Okanagan Falls AWWTP is the sum of the maximum daily flows (above) from each of the three individual collection systems.

1.1.2 The characteristics of the effluent at sampling facility E292449 must meet the following criteria:

- a) 5-day Carbonaceous Biochemical Oxygen Demand (cBOD₅)
Maximum: 10 mg/L
- b) Total Suspended Solids (TSS) Maximum: 10 mg/L
- c) Total Phosphorus Maximum Annual Average: 0.20 mg/L
- d) Total Phosphorus Maximum Daily Concentration: 2.0 mg/L
- e) Total Phosphorus Total Annual Discharge Not to Exceed: 300 kg/yr

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- f) Total Nitrogen Maximum Daily Concentration: less than 10.0 mg/L
- g) Total Nitrogen Annual Average: 6.0 mg/L
- h) E. coli (April 15 – October 15 of each year): 2.2 CFU /100 mL
- i) E. coli (October 16 – April 14 of each year): 50 CFU /100 mL
- j) 96-Hr RBT single concentration: Test must Pass in 100% effluent concentration

96-Hr RBT single concentration- Effluent is acutely toxic if there is greater than 50% mortality during a 96-hour Rainbow Trout (*Oncorhynchus mykiss*) single concentration acute toxicity test in a 100% effluent concentration using “ Biological test Method: Reference Method for Determining Acute Lethality of Effluent to Rainbow Trout, EPS 1/RM/13 Second Edition December 2000”. For the Pass/Fail of a single concentration test an effluent sample is considered to have passed (Pass) if at 100% effluent concentration $\leq 50\%$ of the test fish die after 96-hours of exposure, the test is considered to have failed (Fail) if $> 50\%$ of the test fish die after 96-hours. Test results must be reported in percent (%) mortality.

- 1.1.3 The authorized works are a wastewater collection system and treatment system consisting of the following processes: raw sewage lift station (at old plant site), headworks (screening), primary treatment (primary clarification/fermentation), secondary treatment (bioreactor and secondary clarification - combined treatment unit), tertiary treatment (cloth media disk filtration), effluent continuous flow meter, disinfection (ultraviolet irradiation), optional polishing treatment (seasonal constructed wetland), solids thickening (dissolved air floatation), an effluent outfall to the Okanagan River channel and related appurtenances approximately located as shown on Site Plan A, Site Plan B, and Site Plan C.
- 1.1.4 The seasonal constructed wetland identified in section 1.1.3 may be operated from March 1st to November 30th each year.

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- 1.1.5 The location of the wastewater treatment plant from which the wastewater is discharged is legally described as Lot 3, Plan KAP88006, District Lot 10, Land District Similkameen Division of Yale.
- 1.1.6 The location of the discharge to the Okanagan River channel is legally described as the Plan of Statutory Right of Way over unsurveyed Crown Land, being the bed of Okanagan River to the Southwest of Lot 3, Plan KAP88006, District Lot 10, Land District Similkameen Div of Yale.

1.2 Authorized Use of Reclaimed Water

This section applies to the use of reclaimed water, as defined in the Municipal Wastewater Regulation (MWR), for beneficial purposes including irrigation. The EMS site reference number for this discharge is E292529.

- 1.2.1 There is no maximum authorized rate of reclaimed water that may be beneficially used provided there is no effluent surfacing, overland flow and groundwater breakouts.
- 1.2.2 The authorized works are facilities and related appurtenances required for the beneficial use of reclaimed water.
- 1.2.3 The location of the area where reclaimed water may be used for beneficial purposes including irrigation is described generally as the Okanagan Falls area. Actual authorization for a specific beneficial use must be in accordance with the applicable requirements of the MWR and is contingent upon the submission of a "Beneficial Use Plan" prepared by a qualified professional, to the Director for written approval prior to use.

2. GENERAL REQUIREMENTS

2.1 Maintenance of Works

The Operational Certificate holder must inspect the authorized works regularly and maintain them in good working order.

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If components of the authorized works have a manufacturer's recommended maintenance schedule, then those components must, at minimum, be maintained in accordance with that schedule.

The Operational Certificate holder must maintain a record of inspections, maintenance and any shut down periods of the Authorized Works. The records must be made available for inspection by a designated Officer upon request.

2.2 Emergency Procedures

In the event of an emergency or other condition which prevents normal operation of the Authorized Works or leads to an unauthorized discharge, the Operational Certificate holder must take remedial action immediately to restore the normal operation of the Authorized Works and to prevent any unauthorized discharges. The Operational Certificate holder must immediately report the emergency or other condition and the remedial action that has and will be taken to the EnvironmentalCompliance@gov.bc.ca email address or as otherwise instructed by the director.

2.3 Bypasses

The discharge of effluent which has bypassed the authorized treatment works is prohibited unless the prior approval of the Director is obtained and confirmed in writing.

2.4 Process Modifications

The Director must be notified prior to implementing changes to any process that may affect the quality and/or quantity of the discharge.

2.5 Plans - New Works

- 2.5.1 The Operational Certificate holder must ensure the plans and specifications of the works described in paragraphs 1.1.3 and 1.2.3 Authorized Works are certified by a Qualified Professional and must be constructed in accordance with the certified plans and specifications.

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- 2.5.2 The certified plans and specifications for the authorized works must be retained by the Operational Certificate holder and be available to the Director, or designated Officer, upon request.
- 2.5.3 Reclaimed water irrigation works, if applicable, must be designed and constructed in accordance with current agricultural best management practices and the “Reclaimed Water Guideline – A Companion Document to the Municipal Wastewater Regulation (2013)”.

2.6 Qualified Professionals

All documents submitted to the director by a Qualified Professional must be signed by the author(s).

Qualified Professional means an applied scientist or technologist specializing in an applied science or technology applicable to the duty or function, including, if applicable and without limiting this, agrology, biology, chemistry, engineering, geology or hydrogeology and who:

- i. is registered with the appropriate professional organization, is acting under that organization's code of ethics and is subject to disciplinary action by that organization, and
- ii. through suitable education, experience, accreditation and/or knowledge, may be reasonably relied on to provide advice within their area of expertise.

2.7 Operation and Maintenance

- 2.7.1 The Operational Certificate holder must have a Qualified Professional prepare an Operations and Maintenance Manual for the wastewater collection, the wastewater treatment, reclaimed water utilization and wastewater disposal works.

The Operational Certificate holder must maintain the Operations and Maintenance Manual to reflect current operations.

A copy of the Operations and Maintenance Manual must be retained at the treatment plant and made available for inspections by a designated Officer upon request.

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- 2.7.2 The Operational Certificate holder must operate and maintain a system of preventative maintenance for the wastewater collection, wastewater treatment, effluent utilization, and effluent disposal.

2.8 Facility Classification and Operator Certification

- 2.8.1 The Operational Certificate holder must operate, staff and maintain the Okanagan Falls AWWTP as an Environmental Operator Certification Program (EOCP) Class IV facility and have at least one designated chief operator. The chief operator(s) must maintain a Level IV EOCP certification. Should there be any changes in the Chief Operator(s), the Operational Certificate holder must notify the Director within 30 business days of the change.
- 2.8.2 The Operational Certificate holder must log changes in certification levels of the other operating staff on an ongoing basis and submit an annual comparison of staff certification relative to EOCP requirements as part of the annual reporting requirements.

2.9 Wastewater Collection System - Infiltration, Inflow and Cross Connections

The Operational Certificate holder must inspect and maintain the wastewater collection system works so as to minimize the possibility of cross connections between the storm sewer and the sanitary sewer systems, to minimize infiltration of groundwater, to minimize inflow of water from basement sump pumps and roof drains, and minimize exfiltration of the collected wastewater from the collection system to be discharged to the Okanagan River channel. Report of efforts made to reduce infiltration, inflow and cross-connections are to be included in the annual report each year.

2.10 Sanitary Sewer Bylaw

In order to minimize the potential effect of heavy metals or other toxic materials in the effluent and/or sludge, the Operational Certificate holder must prepare, or review and if necessary update and implement a Sanitary Sewer Bylaw to regulate the input of such wastes to the wastewater collection system. The installation of devices to process household putrescible waste for disposal to the wastewater collection system should be prohibited. Report of efforts made to seek the active cooperation of the public through proactive education program are to be included in the annual report each year. Copy of

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existing Influent Bylaws, or amendments, or similar bylaws or building codes, is to be included in the Annual Report and any amendments submitted with subsequent annual reports.

2.11 Contingency Plan

The Operational Certificate holder must prepare a Contingency Plan that will address the appropriate course of action to be taken in any preconceived emergency and submit a copy of the Contingency Plan to the Director by September 30, 2021. The Contingency Plan must include spill reporting and operational procedures including spill procedures, leaks, and any potential point of concern in the collection, treatment, and disposal systems. Attention is to be given to public safety and the protection of the environment. The Contingency Plan is to be continually updated as necessary to reflect the current operation. Any revisions to the Contingency Plan are to be submitted to the director annually.

2.12 Sludge Management

- a) The management of sludge produced by the subject operation, must be in accordance with the Organic Matter Recycling Regulation (OMRR).
- b) The Operational Certificate holder must retain records of quantities, location, and dates of sludge disposal and/or utilization, for inspection by an officer upon request.

2.13 Odours

The Operational Certificate holder must implement measures to control odour from the sewage collection system and treatment plant operations. Should any aspect of the operation give rise to objectionable odours beyond the property on which the facility is located, the Operational Certificate holder must undertake measures to further prevent objectionable odours.

2.14 Fencing

The Operational Certificate holder must maintain a fence around the Okanagan Falls AWWTP, and decommissioned exfiltration lagoons to prevent unauthorized access.

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2.15 Signage

The Operational Certificate holder must erect and maintain a sign at the main entrance to the Okanagan Falls AWWTP indicating the nature of the facility, and one along the alignment of the outfall diffuser, above the high-water mark advising of the presence of an underwater pipe. The Operational Certificate holder must ensure the signage meets the following criteria:

- (a) identifies the nature of the works,
- (b) indicates the length and depth of the outfall,
- (c) has a surface area of is at least 1 m²,
- (d) the colours of the lettering and the background of the sign contrast sufficiently with each other, and
- (e) is located such that the wording is clearly visible from both land and water

3. MONITORING REQUIREMENTS

3.1 Sampling Procedures

- 3.1.1 The Operational Certificate holder must carry out sampling in accordance with the procedures described in the most recent edition of the "British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples", or by alternative procedures as authorized by the Director.

A copy of the above manual is available on the Ministry web page at <https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/laboratory-standards-quality-assurance/bc-field-sampling-manual>

- 3.1.2 The Operational Certificate holder must take due care in sampling, storing, and transporting the samples to control temperature and avoid contamination, breakage, and any other factor or influence that may compromise the integrity of the samples.

3.2 Analytical Procedures

The Operational Certificate holder must carry out analyses in accordance with the procedures described in the most recent edition of the "British Columbia Environmental Laboratory Methods Manual for the Analysis of Water,

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Wastewater, Sediment, Biological Materials and Discrete Ambient Air Samples", or by alternative procedures as authorized by the Director.

A copy of the above manual is available on the Ministry web page at <https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/laboratory-standards-quality-assurance/bc-environmental-laboratory-manual>

3.3 Quality Assurance

The Operational Certificate holder is required to follow the requirements of the Environmental Data Quality Assurance Regulation (EDQAR). Ten percent of the samples collected must be duplicated to provide data quality assurance. Quality control information generated by the Operational Certificate holder's lab while analysing parameters required by this Operational Certificate must also be provided with the data required to be reported.

3.4 Influent Monitoring Program

- 3.4.1 The Operational Certificate holder must install and maintain a suitable sampling facility (EMS site reference number E292549) and obtain a grab sample of the plant influent once each quarter during a period of maximum daily flow for check analysis of nutrient levels.
- 3.4.2 The Operational Certificate holder must obtain analyses of the influent sample for the following:
- 5-day Carbonaceous Biochemical Oxygen Demand, in mg/L;
 - Total Phosphorus and Ortho Phosphorus, expressed as P in mg/L;
 - Total Nitrogen expressed as N in mg/L; and
 - pH.

3.5 Effluent Monitoring Program

3.5.1 Effluent Monitoring Post Disinfection (E292449)

- 3.5.1.1 The Operational Certificate holder must install and maintain a suitable sampling facility (EMS site reference number E292449) and obtain a composite sample of the effluent, prior to discharge, daily for in-house analysis of ortho-P and pH. The sample is to consist of four grab samples taken over a two-hour period at

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maximum flow and mixed to form a single sample for subsequent analysis. A proportional continuous sampler may be used.

- 3.5.1.2 The Operational Certificate holder must obtain an effluent sample after UV disinfection process but prior to discharge monthly for analysis by an independent accredited lab. Weekly samples may be completed in the laboratory onsite if quality control is maintained to the satisfaction of the Director. The following will be tested:

Parameter	Frequency	Type
flow	continuous	In-line flow meter
Temperature (degrees Celsius)	Daily or continuous	Grab or Meter
cBOD ₅ (mg/L)	monthly	Grab
COD (mg/L)	weekly	Grab
pH	Daily or continuous	Grab or Meter
total N (mg/L)	monthly	Grab
ammonia N (mg/L)	weekly	Grab
nitrate N (mg/L)	weekly	Grab
nitrite N (mg/L)	monthly	Grab
TKN (mg/L)	monthly	Grab
organic N (mg/L)	monthly	Grab
total P (mg/L)	weekly	Grab
dissolved P (mg/L)	monthly	Grab
ortho-P (mg/L)	weekly	Grab
TSS (mg/L)	monthly	Grab
fecal coliforms (CFU/100mL)	weekly	Grab
E. coli (CFU/100mL)	weekly	Grab
Toxicity (96-Hr RBT single concentration)	annually	Grab

- 3.5.1.3 Monitoring for E. coli using an accredited lab, must be conducted on a weekly basis provided that the individual results

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for any two consecutive E. coli samples do not exceed 2.2 CFU/100 mL.

Should two consecutive results exceed 2.2 CFU/100 mL E. coli, daily testing for E. coli is required using an accredited lab for a minimum of two days, or until the individual results of two consecutive daily tests are all less than 2.2 CFU/100 mL.

3.5.1.4 The Operational Certificate holder must annually obtain and analyse the effluent sample for full chemical analysis including main cations, anions, and total metals (aluminum, arsenic, cadmium, calcium, chromium, cobalt, copper, iron, manganese, mercury, molybdenum, nickel, lead, selenium, silver, sodium and zinc).

3.5.1.5 The Operational Certificate holder must Utilize Okanagan River flow data available on the internet at the Water Survey of Canada Real time data site, record daily flows measured at Okanagan River @Okanagan Falls (08NM002) in order to identify flows and calculate the degrees of dilution available. Flow data must be downloaded not less than once per week.

3.5.2 Effluent Monitoring at the End of the Wetland (E319911)

3.5.2.1 The Operational Certificate holder must install and maintain a suitable sampling facility (EMS site reference number E319911).

3.5.2.2 When discharging to Okanagan River during the commissioning phase (April 30, 2021 to November 30, 2022) of the constructed wetland, The Operational Certificate holder must obtain a grab sample of effluent on a frequency listed in the table below and analyse for the applicable parameters listed in the table below:

Parameter	Frequency	Type
cBOD ₅ (mg/L)	Monthly	Grab
pH	Weekly	Meter
Temperature	Weekly	Meter
Total N (mg/L)	Monthly	Grab
Ammonia N (mg/L)	Monthly	Grab
Nitrate N (mg/L)	Monthly	Grab

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Nitrite N (mg/L)	Monthly	Grab
TKN (mg/L)	Monthly	Grab
Organic N (mg/L)	Monthly	Grab
Total P (mg/L)	Weekly	Grab
TSS (mg/L)	Monthly	Grab
E. coli (CFU/100 mL)	Bi-weekly	Grab
Total Metals (mg/L)	Annually	Grab
Common Anions (mg/L)	Annually	Grab
Common Cations (mg/L)	Annually	Grab

3.5.2.3 Starting the year of 2023 and on-going, and when discharging to Okanagan River, The Operational Certificate holder must obtain a grab sample of effluent on a frequency listed in the table below and analyse for the applicable parameters listed in the table below:

Parameter	Frequency	Type
cBOD ₅ (mg/L)	Monthly	Grab
pH	Bi-weekly	Meter
Temperature (degrees Celsius)	Bi-weekly	Meter
Ammonia N (mg/L)	Monthly	Grab
Total P (mg/L)	Bi-weekly	Grab
TSS (mg/L)	Monthly	Grab
E. coli (CFU/100mL)	Monthly	Grab

3.5.3 The Operational Certificate holder must analyse and compare the results of E. coli from sampling facility E292449 and E319911 when any given result from E319911 is above 400 CFU/100 mL.

3.5.4 If Section 3.5.3 is triggered, The Operational Certificate holder must include a science-based analysis in the annual report, mentioned in Section 4.3, that discusses why E. coli numbers are higher at the end of the wetland compared to the results after UV disinfection, and compared to the limits of 2.2 CFU/100mL in the summer months or 50 CFU/100mL in the winter months.

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- 3.5.5 The Operational Certificate holder must provide and maintain a suitable flow measuring device and record once per day the effluent volume discharged to the Okanagan River channel that has undergone UV disinfection, but has not been diverted through the wetland, and the volume utilized for beneficial purposes including irrigation that is discharged to the ground, over a 24-hour period. Record the flows for each calendar month and for each calendar year.

3.6 Sludge Monitoring Program

- 3.6.1 The Operational Certificate holder must obtain a representative sample of the sludge being produced at the treatment plant at least once every six months (EMS site reference number E292609).
- 3.6.2 The Operational Certificate holder must obtain analyses consistent with OMRR for Class B biosolids (Column 3 of Schedule 4, Quality Criteria) of the sludge sample for the following:
- a) Arsenic, mg/kg;
 - b) Cadmium, mg/kg;
 - c) Chromium, mg/kg;
 - d) Cobalt, mg/kg;
 - e) Copper, mg/kg;
 - f) Lead, mg/kg;
 - g) Mercury, mg/kg;
 - h) Molybdenum, mg/kg;
 - i) Nickel, mg/kg;
 - j) Selenium, mg/kg;
 - k) Zinc, mg/kg.

3.7 Wetland Receiving Environment Monitoring Program

The Operational Certificate holder must collect water sample(s) on an annual frequency from monitoring wells listed below and identified on Site Plan D:

- a) EMS ID - E324131 - Well at 1998 Hwy 97
Approximate Google Maps Coordinates: 49.324057, -119.562714;
- b) EMS ID - E324132 - Well [Plate ID 17895] at 2126 Hwy 97
Approximate Google Maps Coordinates: 49.323714, -119.561939;
- c) EMS ID - E324133 - Well [Plate ID 37318] at 2150A Hwy 97
Approximate Google Maps Coordinates: 49.321171, -119.560981; and

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- d) EMS ID - E324134 - Well at 2150 Hwy
Approximate Google Maps Coordinates: 49.319034, -119.557980.

The sample(s) must be analysed for parameters recommended by a Qualified Professional to ensure the groundwater is not being impacted by the engineered wetland. The analysis results must be compared, by a Qualified Professional, to applicable BC Approved Water Quality Guidelines: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines>

3.8 Groundwater and Spray Irrigation Monitoring Program

The Operational Certificate holder must have a Qualified Professional assess and develop an irrigation plan as a component of the Beneficial Use Plan for any and all sites that utilize reclaimed water for irrigation purposes. The irrigation plan must clearly document appropriate agronomic loading rates for each site. Each site and irrigation plan should be reassessed every five years or whenever major changes to the site occur and must include auditing of irrigation duration and application rates.

3.9 Surface Water Impact Monitoring Program

The Operational Certificate holder is required to undertake Okanagan River and Vaseux Lake sampling and monitoring as specified below.

3.9.1 Sampling Sites

A surface water impact monitoring program is required on the Okanagan River and Vaseux Lake. The monitoring program, as a minimum, must consist of one set of samples taken monthly at hydrologically appropriate locations upstream and downstream of the effluent diffuser as follows. Site locations and sampling procedures are to be approved in writing, by the Director.

Okanagan River sites

- a) EMS ID - E295990 – upstream site (50 metres or less upstream of the weir adjacent to the AWWTP);
- b) EMS ID - E295991 – edge of initial dilution zone (IDZ) (100 metres downstream of the diffuser);

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Date amended: May 10, 2021
(most recent)



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- c) EMS ID - E295992 – downstream of IDZ (500 metres downstream of diffuser); and
- d) EMS ID – TBD - Downstream of Vaseux Lake

Vaseux Lake site

- e) E220331 – central deep location (site co-ordinates: 49.300000, -119.533300)

3.9.2 Analyses

Obtain analyses of the Okanagan River sites samples for the following:

Parameter	Frequency	Type
temperature (degrees Celsius)	monthly	meter
dissolved oxygen (mg/L)	monthly	meter
specific conductivity (uS/cm)	monthly	meter
pH	monthly	meter
total suspended solids (mg/L)	monthly	grab
ions (hardness, Cl, SO ₄ , Na, K, Mg) (mg/L)	monthly	grab
nitrogen, (total N, TKN, organic N, nitrate, nitrite, ammonia) (mg/L)	monthly	grab
phosphorus (total P, dissolved P, ortho-phosphate) (mg/L)	monthly	grab
microbiological (October – April) (CFU/100 ml)	monthly	grab
microbiological (May – September) (CFU/100 ml)	weekly for sites 1, 2 and 3; monthly for site 4	grab
benthic macro-invertebrates (if suitable habitat is available)	annually (late summer to early fall)	follow Environment Canada CABIN protocol

Obtain analyses of the Vaseux Lake site samples for the following:

Parameter	Frequency	Type	Sampling Depths		
			Epilimnion	Hypolimnion	Vertical Profile

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temperature	monthly (March (or ice off) to November)	meter	n/a	n/a	every 2m (surface to bottom)
dissolved oxygen	monthly (March (or ice off) to November)	meter	n/a	n/a	every 2m (surface to bottom)
specific conductivity	monthly (March (or ice off) to November)	meter	n/a	n/a	every 2m (surface to bottom)
pH	monthly (March (or ice off) to November)	meter	n/a	n/a	every 2m (surface to bottom)
ions (hardness, Cl, SO ₄ , Na, K, Mg)	monthly (March (or ice off) to November)	grab	1, 5, 10 m composite	20, 22, 24m composite	n/a
nitrogen, (total N, TKN, organic N, nitrate, nitrite, ammonia)	monthly (March (or ice off) to November)	grab	1, 5, 10 m composite	20, 22, 24m composite	n/a
phosphorus (total P, dissolved P, ortho- phosphate)	monthly (March (or ice off) to November)	grab	1, 5, 10 m composite	20, 22, 24m composite	n/a
chlorophyll-A	monthly (March (or ice off) to November)	grab	1, 5, 10 m composite (2 x 1 litre replicate)	20, 22, 24m composite (2 x 1 litre replicate)	n/a
secchi depth (water clarity)	monthly (March (or ice off) to November)	secchi disc	at surface	n/a	n/a

Date issued: May 6, 2013
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(most recent)



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The Operational Certificate holder must submit the proposed method of determining the locations to the Director for approval prior to the commencement of sampling.

4. REPORTING REQUIREMENTS

The Operational Certificate holder must collect and maintain data of analyses and flow measurements required under this Authorization for inspection by an officer upon request.

4.1. Non-compliance Notification

The Operational Certificate holder must immediately notify the director by email at EnvironmentalCompliance@gov.bc.ca or as otherwise instructed by the director of any non-compliance with the requirements of this Authorization and must immediately take remedial action to remedy any effects of such non-compliance.

4.2 Non-compliance Reporting

The Operational Certificate holder must, within 30 days of any non-compliance event, submit to the director a written report that includes, but is not necessarily limited to, the following:

- a) all relevant test results obtained by the Operational Certificate holder related to the non-compliance,
- b) an explanation of the most probable cause(s) of the non-compliance, and
- c) a description of remedial action planned and/or taken by the Operational Certificate holder to prevent similar non-compliance(s) in the future.
- d) The Operational Certificate holder must submit all non-compliance reporting required to be submitted under this section by email to the Ministry's Compliance Reporting Submission Mailbox (CRSM) at EnvironmentalCompliance@gov.bc.ca or as otherwise instructed by the director.

For guidelines on how to report a non-compliance or for more information visit the Ministry website:

<https://www2.gov.bc.ca/gov/content?id=076C5CA3ABD342A784CC49EC78CBAE12>

Date issued: May 6, 2013
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(most recent)



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4.3 **EMS Reporting**

The Operational Certificate holder must ensure all monitoring data analyzed by a qualified laboratory is uploaded to the EMS database within 30 days of the end of each calendar year quarter.

4.4 **Annual Reporting**

The Operational Certificate holder must, on or before April 30th each year, submit to the director an Annual Report for the previous calendar year prepared by a Qualified Professional that includes, but is not limited to:

- a) An Executive Summary that contains a statement by a QP that states either:
 - (i) all or,
 - (ii) not all monitoring and reporting requirements of the OC have been met for the reporting year

- b) Summary of all non-compliances (i.e. number of samples missed, number of exceedances of effluent parameters) including the following details:
 - i. the number of non-compliances that occurred during the reporting period,
 - ii. the dates of each non-compliance,
 - iii. an explanation as to the cause of the non-compliances, and
 - iv. a description of the measures taken by The Operational Certificate holder to rectify the cause of each non-compliance.
 - v. If no non-compliances occurred over the reporting period, the required statement must indicate that no non-compliances occurred during the reporting period.

- c) A review and interpretation of the discharge and receiving environment water quality data and flow data for the preceding calendar year,

- d) Trend analysis with graphs of the historic and current water quality data to help determine any trends or concerns with respect to the various standards contained or described in this OC,

- e) Copies of all raw data and laboratory reports of data collected under this Authorization, attached as appendices to the report,

- f) A summary of all quality assurance/quality control (QA/QC) issues during the calendar year,

Date issued: May 6, 2013
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(most recent)



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- g) Report of all instances where dilution, as discussed in Section 3.5.6, is below 10:1,
- h) Records of effluent water balance, which would include the plant influent flow, the volume of effluent discharged to the Okanagan River channel, Okanagan River discharge data, other volumetric information, and the volume of effluent utilized for irrigation,
- i) Records of the duration, intensity, acreage, location and type of reclaimed water irrigation,
- j) Records of the efforts to reduce infiltration, inflow and cross connections,
- k) Records of efforts to administer the Sanitary Sewer and Storm Sewer by-law(s). Include as an attachment, any amendments to the influent wastes by-law(s) that have been made during the past year,
- l) Records of withdrawal of sludge from the wastewater treatment plant, records of analyses and the location(s) used for disposal and/or utilization,
- m) Records of total phosphorus (expressed as total P in kilograms) discharged to the Okanagan River channel and Vaseux Lake monthly and during the last calendar year,
- n) Records of efforts to implement water conservation initiatives, and
- o) A revised Contingency Plan when applicable.

The Annual Report must be submitted to the director by email at envauthorizationsreporting@gov.bc.ca or as otherwise instructed by the director.

For guidelines on how to properly name the files and email subject lines or for more information, visit the Ministry website:

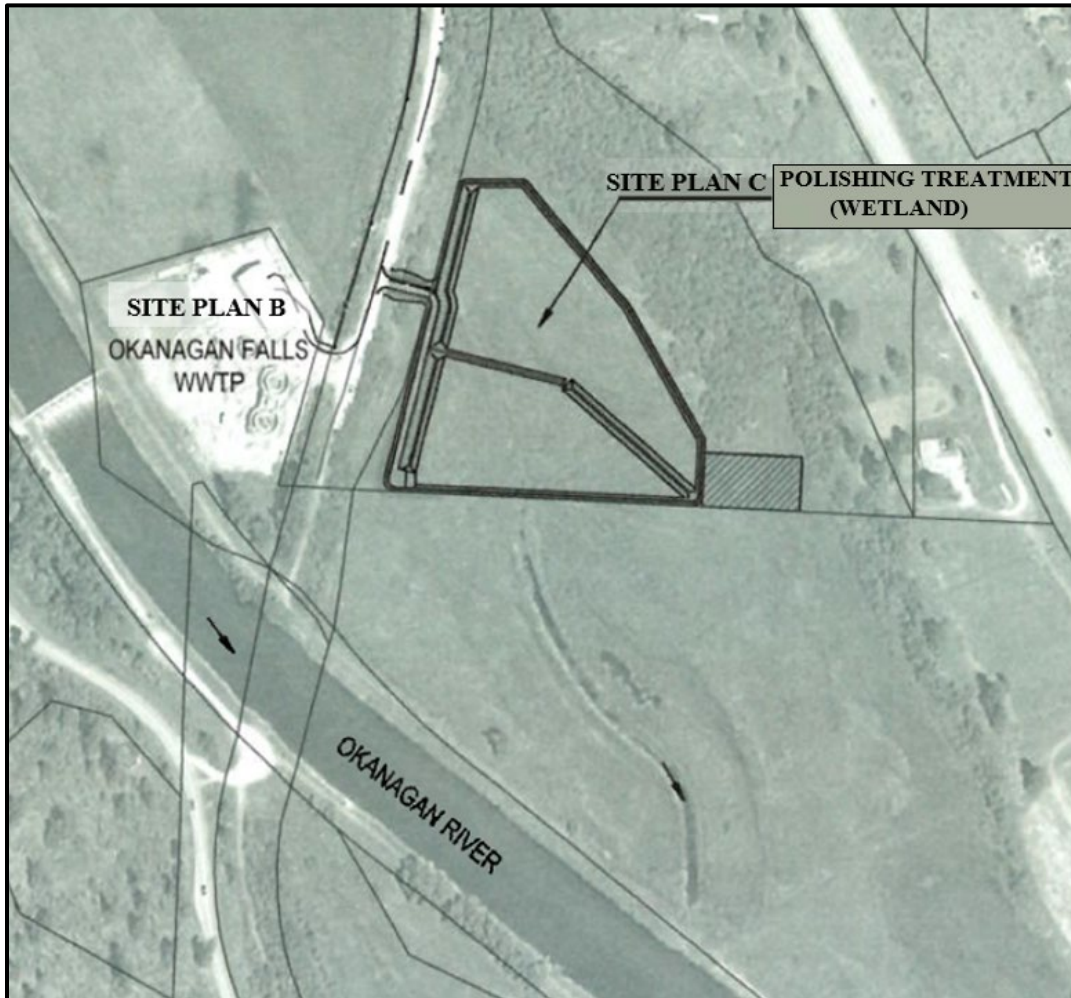
<https://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/routine-environmental-reporting-submission-mailbox>

Date issued: May 6, 2013
Date amended: May 10, 2021
(most recent)



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Southern Interior Region - Okanagan

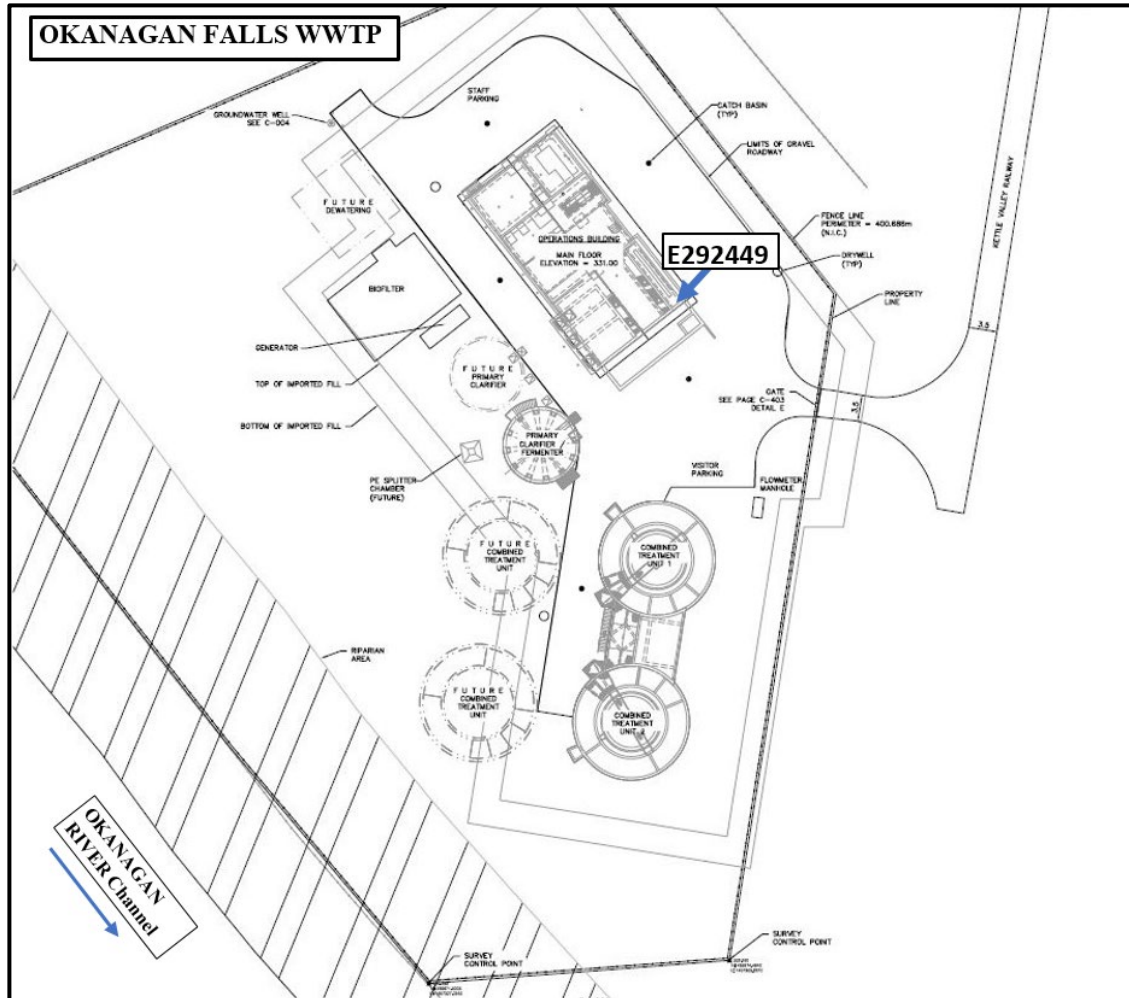
SITE PLAN A



Date issued: May 6, 2013
Date amended: May 10, 2021
(most recent)

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Southern Interior Region - Okanagan

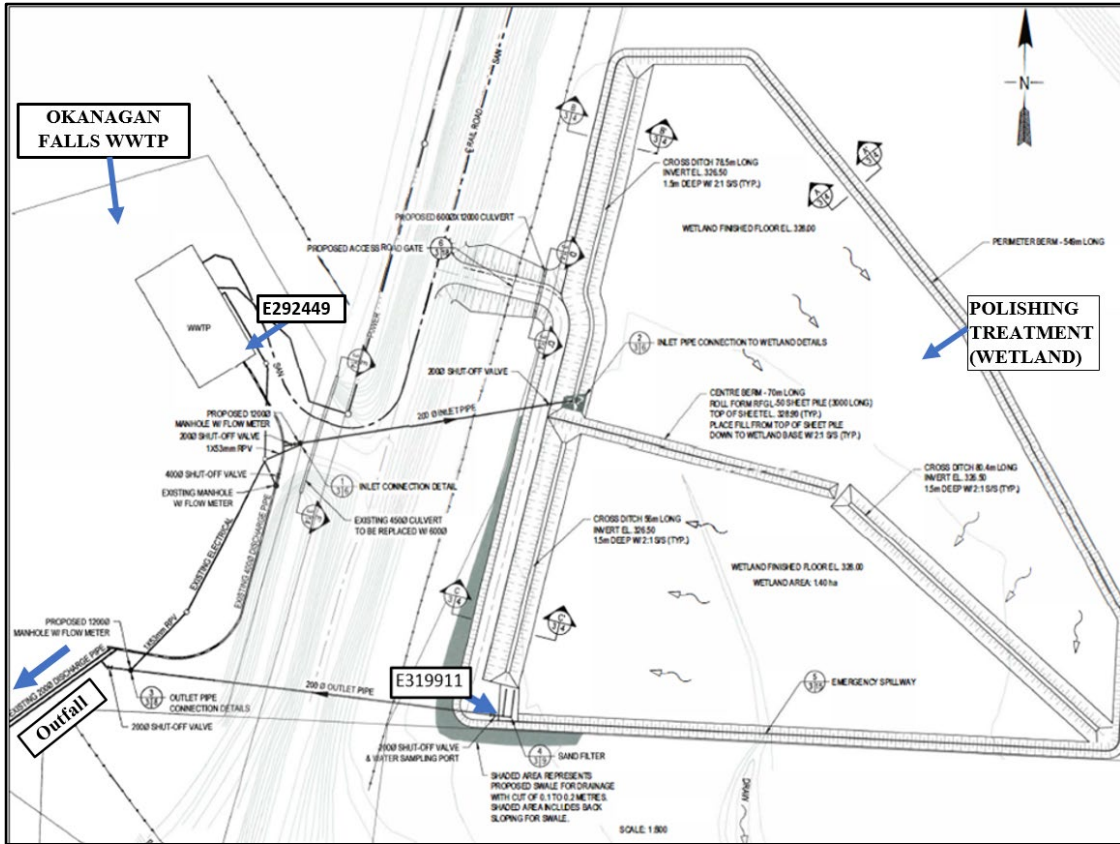
SITE PLAN B



Date issued: May 6, 2013
Date amended: May 10, 2021
(most recent)

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SITE PLAN C



Date issued: May 6, 2013
 Date amended: May 10, 2021
 (most recent)

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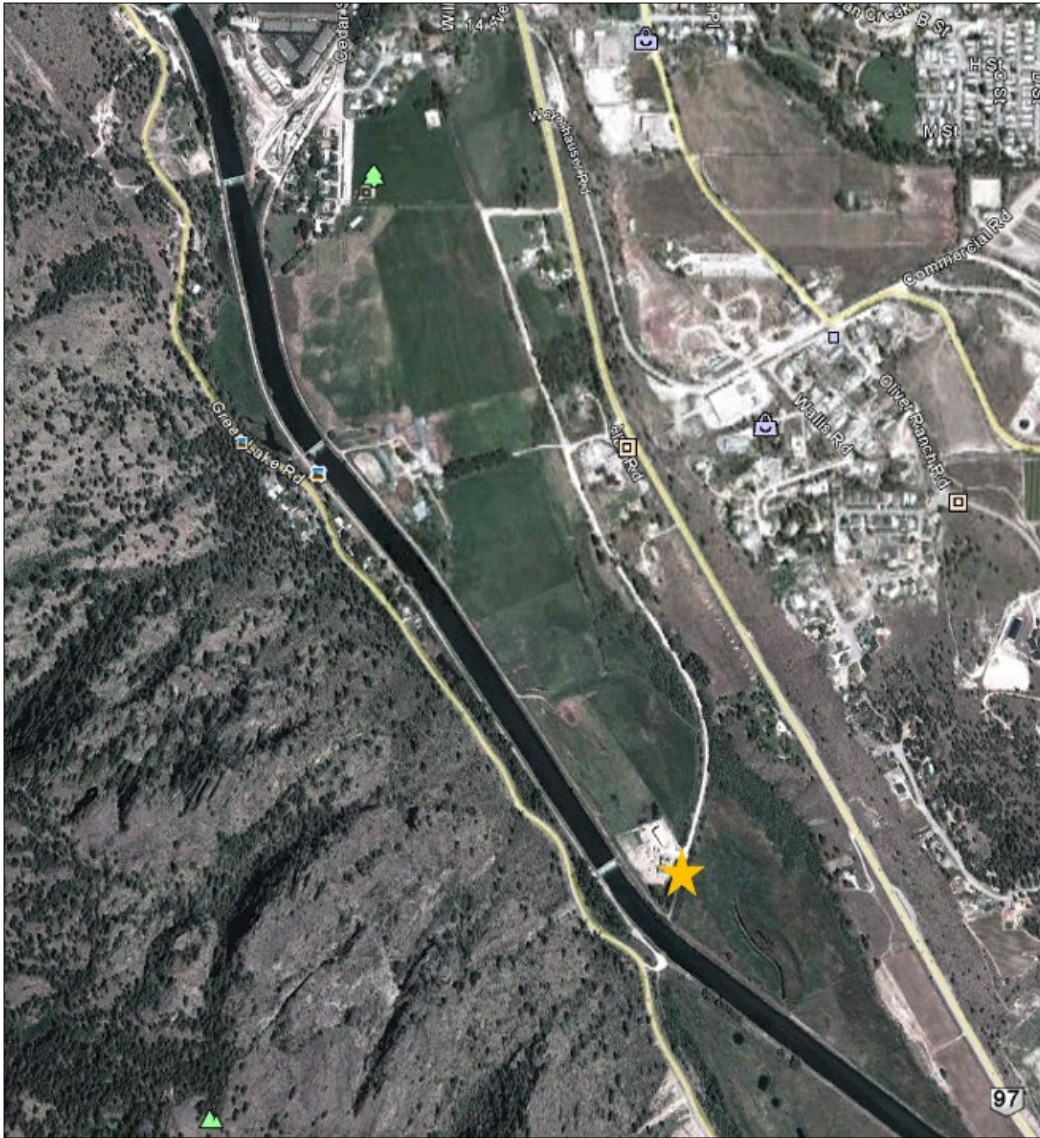
SITE PLAN D



Date issued: May 6, 2013
Date amended: May 10, 2021
(most recent)

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LOCATION MAP



Date issued: May 6, 2013
Date amended: May 10, 2021
(most recent)

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Southern Interior Region - Okanagan

APPENDIX B

Influent 2021 Monitoring Database Summary and RDOS Process Monitoring Data

Okanagan Falls Advanced Wastewater Treatment Facility
Water Quality Results

Analyte	Unit	Sampling Location	Influent	Influent	Influent	Influent	Influent	Influent	Influent	Average	Minimum	Maximum	Standard Deviation
		Date Sampled	20-Jan-21	20-Apr-21	21-Jul-21	21-Jul-21	21-Jul-21	25-Oct-21	08-Nov-21				
Lab Sample ID	Sample Type	21A1890-01	21D2269-01	21G2783-01	21G2783-02	21G2783-03	21J3487-01	21K1263-01					
Field Results													
pH		8.30	8.29	7.55			7.63	8.12	7.98	7.55	8.3	0.36	
Temperature	°C	11.1	13.1	19.3			16.6	15.4	15.1	11.1	19.3	3.2	
Lab Results													
General													
Biochemical oxygen demand	mg/L	302	207	208	231	193			228.2	193	302	43	
5-d Carbonaceous BOD	mg/L							275					
pH		7.11	6.86	7.68	7.67	7.68	7.60	7.91	7.50	6.86	7.91	0.37	
Nutrients													
Ammonia (total, as N)	mg/L	52.8	45.4	37.6	40.2	38.1	38.5	55.9	44.1	37.6	55.9	7.5	
Nitrate (as N)	mg/L	<0.010	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	0.006	<0.010	0.014	0.003	
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010					
Total nitrogen	mg/L	80.3	65.2	57.7	49	47.8	60	83.5	63.4	47.8	83.5	14.1	
Total kjeldahl nitrogen	mg/L	80.3	65.2	57.7	49	47.8	60	83.5	63.4	47.8	83.5	14.1	
Orthophosphate (dissolved, as P)	mg/L	4.27	2.72	3.98	4.08	3.44	3.53	4.84	3.84	2.72	4.84	0.68	
Phosphorus (total, APHA 4500-P)	mg/L	9.07	7.92	7.14	7.33	6.54	5.19	11.2	7.77	5.19	11.2	1.93	



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

DATE ANALYZED	DATE COMPOSITE STARTED	TIME COMPOSITE STARTED	DATE COMPOSITE ENDED	TIME COMPOSITE ENDED	LAB TESTER'S INITIALS	REACTIVE PHOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	COMMENTS
dd-mm-yr	dd/mm/yr	hh:mm	dd/mm/yr	hh:mm		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	32 samples
24-Nov-21	23-Nov-21	14:17	24-Nov-21	9:45	KM	4.70	6.69	34.6		11.2	45.8	16 samples only as battery low
25-Nov-21	24-Nov-21		24-Nov-21		KM	2.61	4.86	27.6	0.325	11.6	39.5	48 samples
1-Dec-21	30-Nov-21	10:40	1-Dec-21	10:20	KM	3.75	8.35	27.7	0.390	14.5	42.6	33 samples battery died
9-Dec-21	8-Dec-21	12:05	9-Dec-21	4:05	KM	3.88	6.52	35.1	0.383	16.5	52.0	48 samples
15-Dec-21	13-Dec-21	11:26	14-Dec-21	10:46	KM	3.46	6.10	27.5	0.311	13.5	41.3	48 samples
23-Dec-21	22-Dec-21	10:08	23-Dec-21	9:38	KM	3.46	6.39	25.0	0.309	13.3	38.6	48 samples
30-Dec-21	28-Dec-21	11:02	29-Dec-21	10:32	KM	2.76	5.02	27.8		10.9	38.7	48 samples
Average						3.52	6.28	29.3	0.344	13.1	42.6	
n						7	7	7	5	7	7	
Std. Dev.						0.71	1.2	3.9	0.040	2.0	4.8	
Min						2.61	4.86	25.0	0.309	10.9	38.6	
Max						4.70	8.35	35.1	0.390	16.5	52.0	

APPENDIX C

Influent Monitoring 2021 Lab Reports

CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QI

PROJECT INFO

WORK ORDER 21A1890

RECEIVED / TEMP 2021-01-21 09:00 / 2°C

REPORTED 2021-02-03 14:04

COC NUMBER B104017

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.

Work Order Comments:

Custody Seals Intact: YES

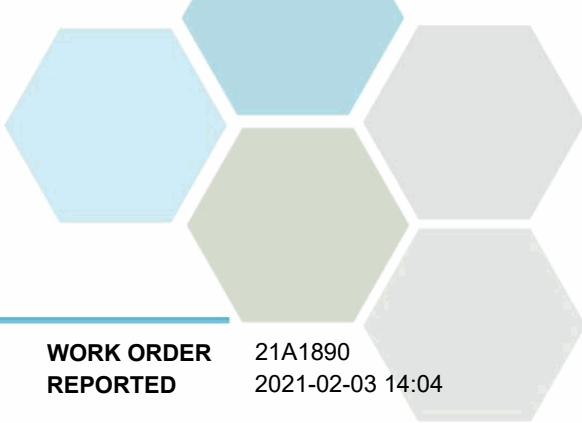
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

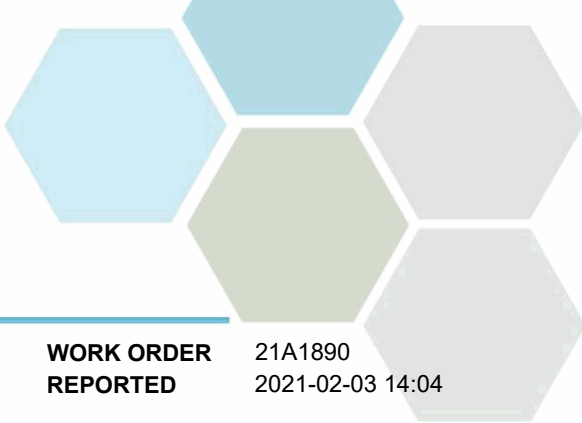
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21A1890
2021-02-03 14:04

Analyte	Result	RL	Units	Analyzed	Qualifier
Influent Grab (21A1890-01) Matrix: Water Sampled: 2021-01-20 11:10					PRES
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-01-24	HT1
Nitrite (as N)	< 0.010	0.010	mg/L	2021-01-24	HT1
Phosphate (as P)	4.27	0.0050	mg/L	2021-01-24	HT1
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	80.3	2.00	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	52.8	0.050	mg/L	2021-02-02	
BOD, 5-day	302	2.0	mg/L	2021-01-27	
Nitrogen, Total Kjeldahl	80.3	0.050	mg/L	2021-01-25	
pH	7.11	0.10	pH units	2021-01-26	HT2
Phosphorus, Total (as P)	9.07	0.0050	mg/L	2021-01-25	

Sample Qualifiers:

- 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.
- PRES Sample has been preserved for TKN, TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21A1890
2021-02-03 14:04

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21D2269
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-04-21 12:40 / 9°C 2021-04-28 16:00
PO NUMBER	OK Falls WW	COC NUMBER	B104531
PROJECT	OK Falls WWTP QI		
PROJECT INFO			

Introduction:

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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.

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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.

Work Order Comments:

Custody Seals Intact: YES

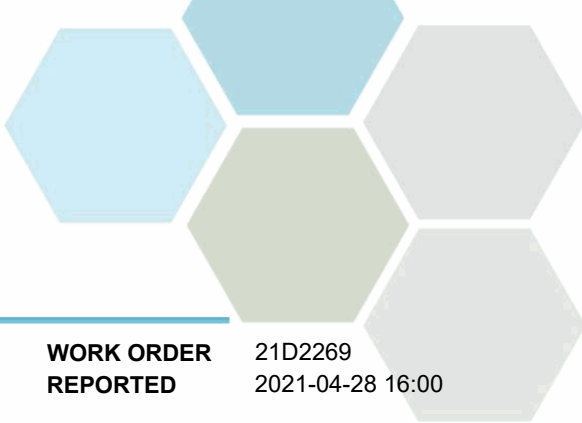
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21D2269
2021-04-28 16:00

Analyte	Result	RL	Units	Analyzed	Qualifier
Influent Grab (21D2269-01) Matrix: Water Sampled: 2021-04-20 10:35					PRES
<i>Anions</i>					
Nitrate (as N)	0.014	0.010	mg/L	2021-04-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-23	
Phosphate (as P)	2.72	0.0050	mg/L	2021-04-23	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	0.0137	0.0100	mg/L	N/A	
Nitrogen, Total	65.2	2.00	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	45.4	0.050	mg/L	2021-04-23	
BOD, 5-day	207	2.0	mg/L	2021-04-28	
Nitrogen, Total Kjeldahl	65.2	0.050	mg/L	2021-04-27	
pH	6.86	0.10	pH units	2021-04-27	HT2
Phosphorus, Total (as P)	7.92	0.0050	mg/L	2021-04-26	

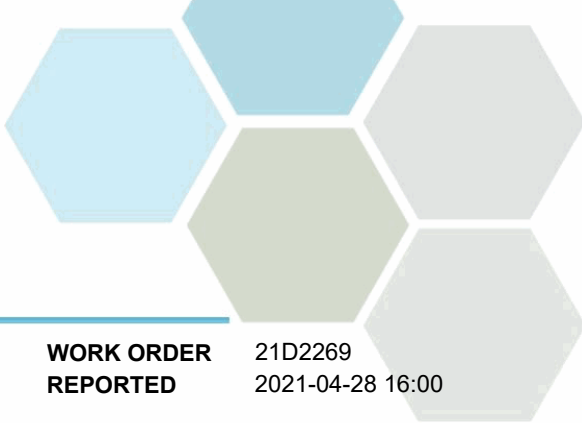
Field Blank - Influent (21D2269-02) | Matrix: Water | Sampled: 2021-04-20 10:40

PRES

<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-23	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-04-23	
BOD, 5-day	< 1.4	2.0	mg/L	2021-04-28	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-04-27	
pH	6.24	0.10	pH units	2021-04-27	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-04-26	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
PRES Sample has been preserved for NH3, TKN & TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21D2269
2021-04-28 16:00

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2783
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-22 12:30 / 10.8°C 2021-07-29 13:03
PO NUMBER	OK Falls WW	COC NUMBER	B095373
PROJECT	OK Falls WWTP QI		
PROJECT INFO			

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

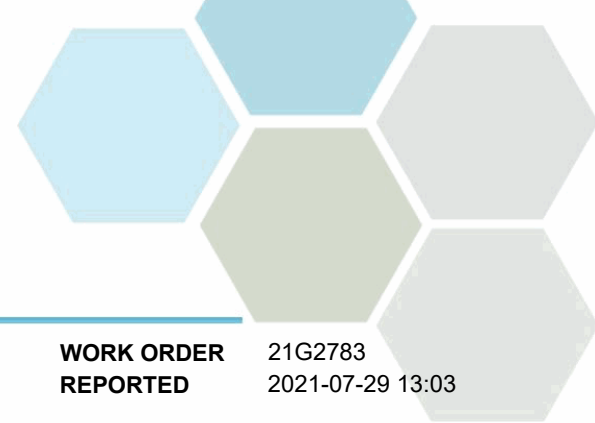
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21G2783
2021-07-29 13:03

Analyte	Result	RL	Units	Analyzed	Qualifier
Influent Grab (21G2783-01) Matrix: Water Sampled: 2021-07-21 09:42					PRES

Anions

Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
Phosphate (as P)	3.98	0.0050	mg/L	2021-07-23	

Calculated Parameters

Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	57.7	2.00	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	37.6	0.050	mg/L	2021-07-26	
BOD, 5-day	208	2.0	mg/L	2021-07-28	
Nitrogen, Total Kjeldahl	57.7	0.050	mg/L	2021-07-28	
pH	7.68	0.10	pH units	2021-07-26	HT2
Phosphorus, Total (as P)	7.14	0.0050	mg/L	2021-07-28	

Influent Grab Rep 1 (21G2783-02) | Matrix: Water | Sampled: 2021-07-21 09:42

PRES

Anions

Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
Phosphate (as P)	4.08	0.0050	mg/L	2021-07-23	

Calculated Parameters

Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	49.0	1.25	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	40.2	0.050	mg/L	2021-07-26	
BOD, 5-day	231	2.0	mg/L	2021-07-28	
Nitrogen, Total Kjeldahl	49.0	0.050	mg/L	2021-07-28	
pH	7.67	0.10	pH units	2021-07-26	HT2
Phosphorus, Total (as P)	7.33	0.0050	mg/L	2021-07-28	

Influent Grab Rep 2 (21G2783-03) | Matrix: Water | Sampled: 2021-07-21 09:42

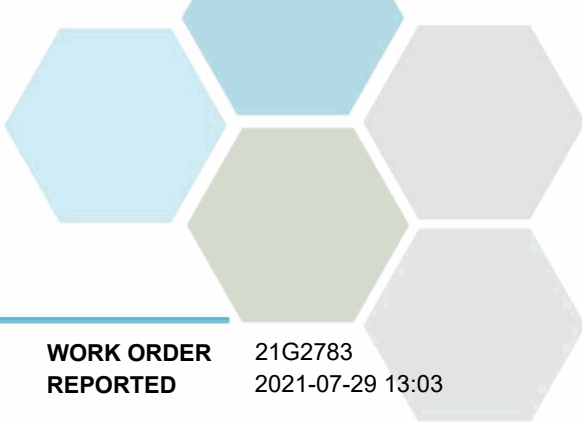
PRES

Anions

Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
Phosphate (as P)	3.44	0.0050	mg/L	2021-07-23	

Calculated Parameters

Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	47.8	1.25	mg/L	N/A	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21G2783
2021-07-29 13:03

Analyte	Result	RL	Units	Analyzed	Qualifier
Influent Grab Rep 2 (21G2783-03) Matrix: Water Sampled: 2021-07-21 09:42, Continued					PRES

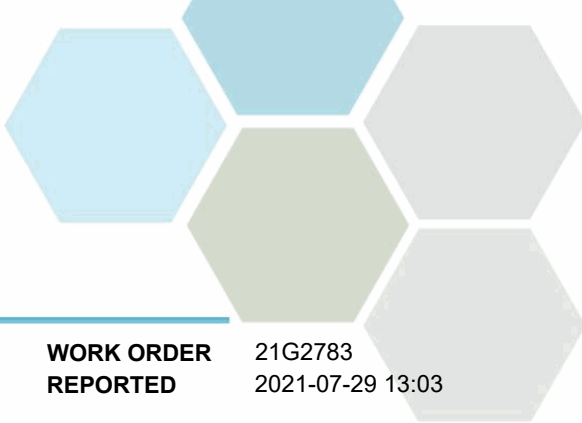
General Parameters

Ammonia, Total (as N)	38.1	0.050	mg/L	2021-07-26	
BOD, 5-day	193	2.0	mg/L	2021-07-28	
Nitrogen, Total Kjeldahl	47.8	0.050	mg/L	2021-07-28	
pH	7.68	0.10	pH units	2021-07-26	HT2
Phosphorus, Total (as P)	6.54	0.0050	mg/L	2021-07-28	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

PRES Sample has been preserved for TKN, NH3, TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21G2783
2021-07-29 13:03

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna

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

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pH units	pH < 7 = acidic, pH > 7 = basic
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J3487
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-26 12:10 / 4.0°C
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP QI		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

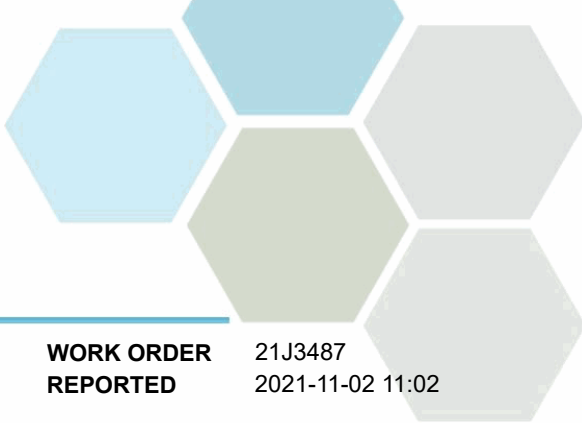
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

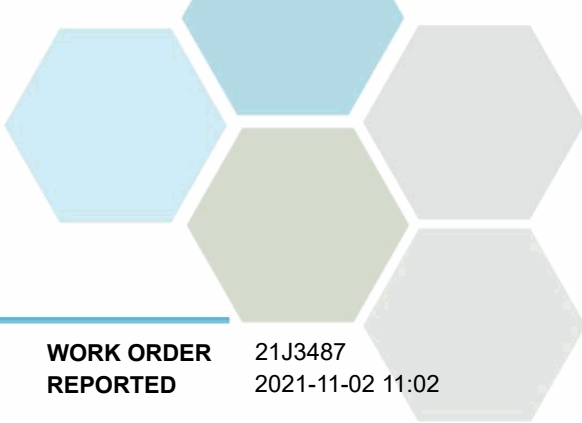
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21J3487
2021-11-02 11:02

Analyte	Result	RL	Units	Analyzed	Qualifier
Influent Grab (21J3487-01) Matrix: Water Sampled: 2021-10-25 09:41					PRES
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-10-28	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-10-28	
Phosphate (as P)	3.53	0.0050	mg/L	2021-10-28	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	60.0	2.00	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	38.5	0.050	mg/L	2021-10-29	
BOD, 5-day	> 15	2.0	mg/L	2021-11-01	
Nitrogen, Total Kjeldahl	60.0	0.050	mg/L	2021-11-01	
pH	7.60	0.10	pH units	2021-10-30	HT2
Phosphorus, Total (as P)	5.19	0.0050	mg/L	2021-11-01	

Sample Qualifiers:

- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21J3487
2021-11-02 11:02

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna

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

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>	Greater than the specified Result
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K1263
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-09 12:00 / 4.1°C 2021-11-15 16:13
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP QI		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: N/A

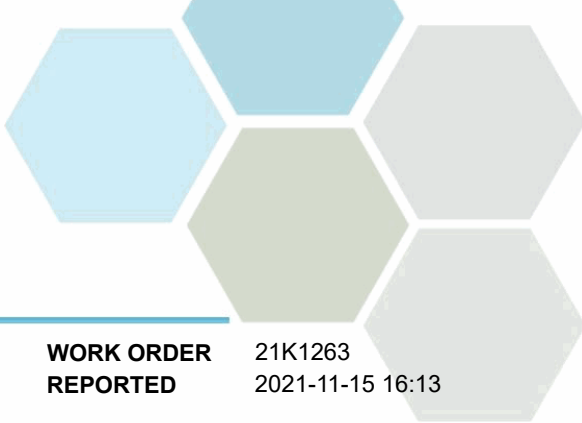
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

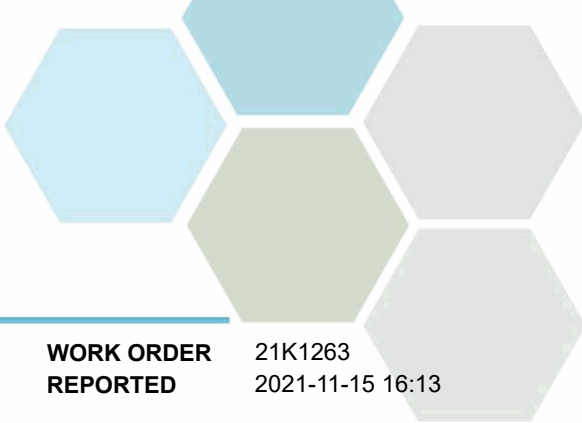
WORK ORDER REPORTED 21K1263
2021-11-15 16:13

Analyte	Result	RL	Units	Analyzed	Qualifier
Influent Grab (21K1263-01) Matrix: Water Sampled: 2021-11-08 10:37					PRES
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-11-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-11-10	
Phosphate (as P)	4.84	0.0050	mg/L	2021-11-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	83.5	2.00	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	55.9	0.050	mg/L	2021-11-10	
BOD, 5-day Carbonaceous	275	2.0	mg/L	2021-11-15	
Nitrogen, Total Kjeldahl	83.5	0.050	mg/L	2021-11-12	
pH	7.91	0.10	pH units	2021-11-09	HT2
Phosphorus, Total (as P)	11.2	0.0050	mg/L	2021-11-10	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

PRES Sample has been preserved for TP, NH3 in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QI

WORK ORDER REPORTED 21K1263
2021-11-15 16:13

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna

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

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APPENDIX D

Solids (TWAS and FPS) Monitoring Database Summary 2021

Okanagan Falls Advanced Wastewater Treatment Facility

Soil Quality Results

Analyte		Unit	Guideline BC OMRR Class B	Sampling Location					
				Fermented Primary Sludge (FPS)	Fermented Primary Sludge (FPS)	Fermented Primary Sludge (FPS)	Fermented Primary Sludge (FPS)	Fermented Primary Sludge (FPS)	Fermented Primary Sludge (FPS)
Date Sampled				19-Jan-21	20-Apr-21	20-Jul-21	20-Jul-21	20-Jul-21	25-Oct-21
Lab Sample ID				21A1889-01	21D2270-01	21G2746-01	21G2746-02	21G2746-03	21J3489-02
Sample Type				Normal	Normal	Normal	Duplicate	Duplicate	Normal
Lab Results									
General									
Percent solids	% wet	NG	2.1	12.1	8.6	10.8	9.0	5.6	
Total volatile solids (percent)	% dry	NG	81.4	92.5	86.6	87.0	87.1	85.3	
Metals									
Arsenic	µg/g	75	3.74	2.27	3.88	3.77	3.86	1.80	
Cadmium	µg/g	20	1.23	0.628	0.889	0.919	0.817	0.683	
Chromium	µg/g	1060	17.7	13.0	17.3	17.7	350	9.0	
Cobalt	µg/g	150	0.98	0.70	0.98	0.91	1.35	0.49	
Copper	µg/g	2200	264	166	245	228	240	125	
Lead	µg/g	500	9.77	7.24	10.5	10.1	12.0	6.07	
Mercury	µg/g	15	0.343	0.369	0.466	0.583	0.406	0.277	
Molybdenum	µg/g	20	8.18	5.50	8.48	8.53	8.84	4.40	
Nickel	µg/g	180	11.1	8.38	10.6	11.5	11.7	5.12	
Selenium	µg/g	14	3.96	2.94	4.48	4.78	4.46	2.33	
Zinc	µg/g	1850	791	475	714	713	724	433	

BC OMRR Class B = BC Organic Matter Recycling Regulation, Quality Criteria for Class B biosolids and Class B compost, Schedule 4



Okanagan Falls Advanced Wastewater Treatment Facility

Soil Quality Results

		Sampling Location	Thickened Waste Activated Sludge (TWAS)	Thickened Waste Activated Sludge (TWAS)	Thickened Waste Activated Sludge (TWAS)	Thickened Waste Activated Sludge (TWAS)	Thickened Waste Activated Sludge (TWAS)	Thickened Waste Activated Sludge (TWAS)	
			Date Sampled	19-Jan-21	20-Apr-21	20-Jul-21	20-Jul-21	20-Jul-21	25-Oct-21
			Lab Sample ID	21A1889-02	21D2270-02	21G2746-04	21G2746-05	21G2746-06	21J3489-01
			Sample Type	Normal	Normal	Normal	Duplicate	Duplicate	Normal
Analyte	Unit	Guideline BC OMRR Class B							
Lab Results									
General									
Percent solids	% wet	NG	2.1	2.5	2.3	2.3	2.2	2.4	
Total volatile solids (percent)	% dry	NG	86.9	81.7	77.7	77.4	77.3	80.4	
Metals									
Arsenic	µg/g	75	3.61	3.08	2.59	2.76	2.69	1.47	
Cadmium	µg/g	20	1.32	0.692	0.854	0.949	0.907	0.465	
Chromium	µg/g	1060	7.8	6.8	8.3	9.2	8.8	3.4	
Cobalt	µg/g	150	1.13	1.04	1.12	1.12	1.14	0.54	
Copper	µg/g	2200	328	223	256	275	266	99.6	
Lead	µg/g	500	8.27	7.58	7.97	8.28	8.47	3.38	
Mercury	µg/g	15	0.248	0.179	0.206	0.236	0.226	0.095	
Molybdenum	µg/g	20	9.47	7.56	7.50	8.07	7.74	3.45	
Nickel	µg/g	180	9.33	6.96	9.56	10.4	9.90	4.14	
Selenium	µg/g	14	6.08	5.07	7.56	7.93	8.24	2.84	
Zinc	µg/g	1850	622	523	568	608	593	233	

BC OMRR Class B = BC Organic Matter Recycling Regulation, Quality Criteria for Class B biosolids and Class B compost, Schedule 4



Appendix D

Okanagan Falls Advanced Wastewater Treatment Facility

Soil Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results	Number of Results with Exceedances
Lab Results									
Percent solids	Fermented Primary Sludge (FPS)	% wet	8.0	2.1	12.1	3.6	6	6	0
	Thickened Waste Activated Sludge (TWAS)	% wet	2.3	2.1	2.5	0.1	6	6	0
Total volatile solids (percent)	Fermented Primary Sludge (FPS)	% dry	86.6	81.4	92.5	3.6	6	6	0
	Thickened Waste Activated Sludge (TWAS)	% dry	80.2	77.3	86.9	3.7	6	6	0
Metals									
Arsenic	Fermented Primary Sludge (FPS)	µg/g	3.22	1.80	3.88	0.931	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	2.70	1.47	3.61	0.707	6	6	0
Cadmium	Fermented Primary Sludge (FPS)	µg/g	0.861	0.628	1.23	0.214	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	0.865	0.465	1.32	0.285	6	6	0
Chromium	Fermented Primary Sludge (FPS)	µg/g	71	9.0	350	140	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	7.4	3.4	9.2	2.1	6	6	0
Cobalt	Fermented Primary Sludge (FPS)	µg/g	0.90	0.49	1.35	0.29	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	1.0	0.54	1.14	0.24	6	6	0
Copper	Fermented Primary Sludge (FPS)	µg/g	211	125	264	53.9	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	241	99.6	328	77.3	6	6	0
Lead	Fermented Primary Sludge (FPS)	µg/g	9.28	6.07	12.0	2.2	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	7.32	3.38	8.47	1.96	6	6	0
Mercury	Fermented Primary Sludge (FPS)	µg/g	0.407	0.277	0.583	0.107	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	0.20	0.095	0.248	0.056	6	6	0
Molybdenum	Fermented Primary Sludge (FPS)	µg/g	7.32	4.40	8.84	1.88	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	7.3	3.45	9.47	2.02	6	6	0
Nickel	Fermented Primary Sludge (FPS)	µg/g	9.73	5.12	11.7	2.56	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	8.38	4.14	10.4	2.39	6	6	0
Selenium	Fermented Primary Sludge (FPS)	µg/g	3.83	2.33	4.78	0.978	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	6.29	2.84	8.24	2.08	6	6	0
Zinc	Fermented Primary Sludge (FPS)	µg/g	642	433	791	149	6	6	0
	Thickened Waste Activated Sludge (TWAS)	µg/g	524	233	622	147	6	6	0

Legend for Reports for RDOS Wastewater Treatment Sites Soil Quality Results

<	Less than reported detection limit
>	Greater than reported upper detection limit
>=	Greater than or equal to
A	Absent
BC OMRR Class B	BC Organic Matter Recycling Regulation, Quality Criteria for Class B biosolids and Class B compost, Schedule 4
Calc	Calculated guideline or standard. The guideline or standard is dependent on the value of one or more other analytes, and is calculated from a formula or table.
L	Laboratory reading type (Lab result)
m asl	metres above sea level
N	Narrative type of guideline or standard, or Result Note.
ND	Non-detect. Result is less than lower detection limit.
NG	No Guideline
NR	No Result
NS	No Standard
NT	Not Tested
OG	Overgrown
P	Present
PR	Presumptive
TK	Test kit reading type (Field result)
TNTC	Too numerous to count
	Highlighted value has a lower detection limit that is greater than the guideline/standard maximum and/or the guideline/standard minimum, or has an upper detection limit that is less than the guideline/standard maximum and/or the guideline/standard minimum.
	The maximum guideline/standard value cannot be determined because a result for a dependent analyte is not available for the sample.
BC OMRR Class B	Highlighted value exceeds BC OMRR Class B
SL Criteria Override	Highlighted value exceeds sampling location criteria override

APPENDIX E

Solids (TWAS and FPS) 2021 Lab Reports



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21A1889
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-01-21 09:00 / 2°C
PO NUMBER	OK Falls WW	REPORTED	2021-02-05 13:53
PROJECT	OK Falls WWTP QS	COC NUMBER	B104017
PROJECT INFO			

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.

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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.

Work Order Comments:

Custody Seals Intact: YES

This is a revised report; please refer to Appendix 3 for details.

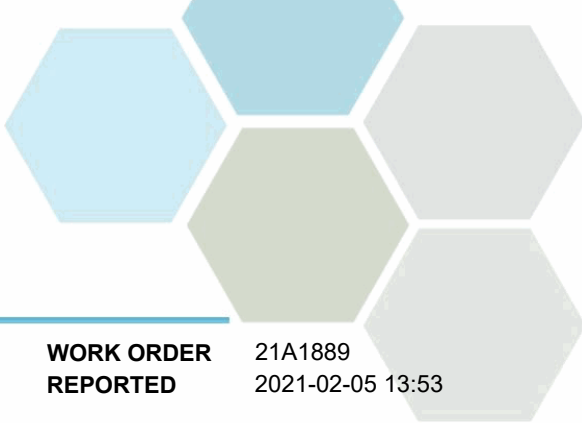
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21A1889
2021-02-05 13:53

Analyte	Result	RL	Units	Analyzed	Qualifier
FPS (21A1889-01) Matrix: Solid Sampled: 2021-01-19 11:15					
<i>General Parameters</i>					
Solids, Total	2.1	0.1	% wet	2021-01-25	
Solids, Volatile	81.4	0.1	% dry	2021-01-25	
<i>Strong Acid Leachable Metals</i>					
Arsenic	3.74	0.30	mg/kg dry	2021-01-28	
Cadmium	1.23	0.040	mg/kg dry	2021-01-28	
Chromium	17.7	1.0	mg/kg dry	2021-01-28	
Cobalt	0.98	0.10	mg/kg dry	2021-01-28	
Copper	264	0.40	mg/kg dry	2021-01-28	
Lead	9.77	0.20	mg/kg dry	2021-01-28	
Mercury	0.343	0.040	mg/kg dry	2021-01-28	
Molybdenum	8.18	0.10	mg/kg dry	2021-01-28	
Nickel	11.1	0.60	mg/kg dry	2021-01-28	
Selenium	3.96	0.20	mg/kg dry	2021-01-28	
Zinc	791	2.0	mg/kg dry	2021-01-28	

TWAS (21A1889-02) | Matrix: Solid | Sampled: 2021-01-19 11:20

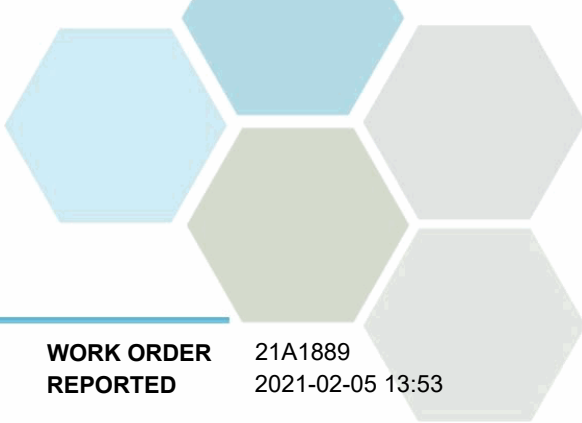
<i>General Parameters</i>					
Solids, Volatile	86.9	0.1	% dry	2021-01-25	
<i>Strong Acid Leachable Metals</i>					
Arsenic	3.61	0.30	mg/kg dry	2021-01-28	
Cadmium	1.32	0.040	mg/kg dry	2021-01-28	
Chromium	7.8	1.0	mg/kg dry	2021-01-28	
Cobalt	1.13	0.10	mg/kg dry	2021-01-28	
Copper	328	0.40	mg/kg dry	2021-01-28	
Lead	8.27	0.20	mg/kg dry	2021-01-28	
Mercury	0.248	0.040	mg/kg dry	2021-01-28	
Molybdenum	9.47	0.10	mg/kg dry	2021-01-28	
Nickel	9.33	0.60	mg/kg dry	2021-01-28	
Selenium	6.08	0.20	mg/kg dry	2021-01-28	
Zinc	622	2.0	mg/kg dry	2021-01-28	

TWAS (21A1889-02RE1) | Matrix: Solid | Sampled: 2021-01-19 11:20

<i>General Parameters</i>					
Solids, Total	2.1	0.1	% wet	2021-02-03	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21A1889
2021-02-05 13:53

Analysis Description	Method Ref.	Technique	Accredited	Location
SALM in Solid	BCMOE SALM V.2 / EPA 6020B	HNO ₃ +HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Solids, Total in Solid	SM 2540 G (2017)	Gravimetry		Kelowna
Solids, Volatile in Solid	SM 2540 G (2017)	Gravimetry		Kelowna

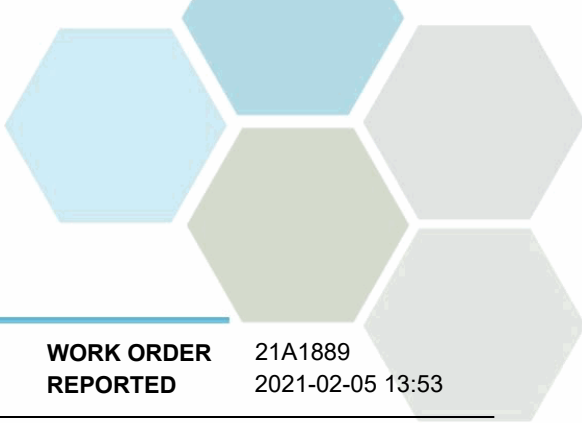
Glossary of Terms:

RL	Reporting Limit (default)
% dry	Percent (dry weight basis)
% wet	Percent (as received basis)
mg/kg dry	Milligrams per kilogram (dry weight basis)
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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APPENDIX 3: REVISION HISTORY

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls WWTP QS			WORK ORDER REPORTED	21A1889 2021-02-05 13:53
Sample ID	Changed	Change	Analysis	Analyte(s)	
21A1889-02	2021-02-05	Made Non-Reportable	Solids, Total	Solids, Total	

CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QS

PROJECT INFO

WORK ORDER 21D2270

RECEIVED / TEMP 2021-04-21 12:40 / 9°C

REPORTED 2021-04-29 12:02

COC NUMBER B104531

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.

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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.

Work Order Comments:

Custody Seals Intact: YES

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

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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TEST RESULTS

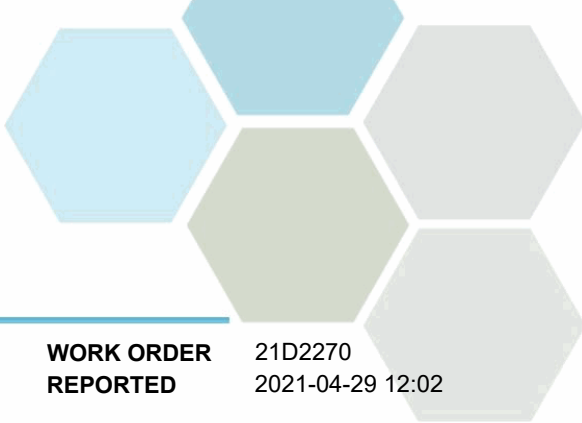
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21D2270
2021-04-29 12:02

Analyte	Result	RL	Units	Analyzed	Qualifier
FPS (21D2270-01) Matrix: Solid Sampled: 2021-04-20 10:45					
<i>General Parameters</i>					
Solids, Total	12.1	0.1	% wet	2021-04-27	
Solids, Volatile	92.5	0.1	% dry	2021-04-27	
<i>Strong Acid Leachable Metals</i>					
Arsenic	2.27	0.30	mg/kg dry	2021-04-29	
Cadmium	0.628	0.040	mg/kg dry	2021-04-29	
Chromium	13.0	1.0	mg/kg dry	2021-04-29	
Cobalt	0.70	0.10	mg/kg dry	2021-04-29	
Copper	166	0.40	mg/kg dry	2021-04-29	
Lead	7.24	0.20	mg/kg dry	2021-04-29	
Mercury	0.369	0.040	mg/kg dry	2021-04-29	
Molybdenum	5.50	0.10	mg/kg dry	2021-04-29	
Nickel	8.38	0.60	mg/kg dry	2021-04-29	
Selenium	2.94	0.20	mg/kg dry	2021-04-29	
Zinc	475	2.0	mg/kg dry	2021-04-29	

TWAS (21D2270-02) | Matrix: Solid | Sampled: 2021-04-20 10:55

<i>General Parameters</i>					
Solids, Total	2.5	0.1	% wet	2021-04-27	
Solids, Volatile	81.7	0.1	% dry	2021-04-27	
<i>Strong Acid Leachable Metals</i>					
Arsenic	3.08	0.30	mg/kg dry	2021-04-29	
Cadmium	0.692	0.040	mg/kg dry	2021-04-29	
Chromium	6.8	1.0	mg/kg dry	2021-04-29	
Cobalt	1.04	0.10	mg/kg dry	2021-04-29	
Copper	223	0.40	mg/kg dry	2021-04-29	
Lead	7.58	0.20	mg/kg dry	2021-04-29	
Mercury	0.179	0.040	mg/kg dry	2021-04-29	
Molybdenum	7.56	0.10	mg/kg dry	2021-04-29	
Nickel	6.96	0.60	mg/kg dry	2021-04-29	
Selenium	5.07	0.20	mg/kg dry	2021-04-29	
Zinc	523	2.0	mg/kg dry	2021-04-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21D2270
2021-04-29 12:02

Analysis Description	Method Ref.	Technique	Accredited	Location
SALM in Solid	BCMOE SALM V.2 / EPA 6020B	HNO ₃ +HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Solids, Total in Solid	SM 2540 G (2017)	Gravimetry		Kelowna
Solids, Volatile in Solid	SM 2540 G (2017)	Gravimetry		Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
% dry	Percent (dry weight basis)
% wet	Percent (as received basis)
mg/kg dry	Milligrams per kilogram (dry weight basis)
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2746
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-21 12:20 / 17.1°C 2021-07-28 09:58
PO NUMBER	OK Falls WW	COC NUMBER	B095370
PROJECT	OK Falls WWTP QS		
PROJECT INFO			

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

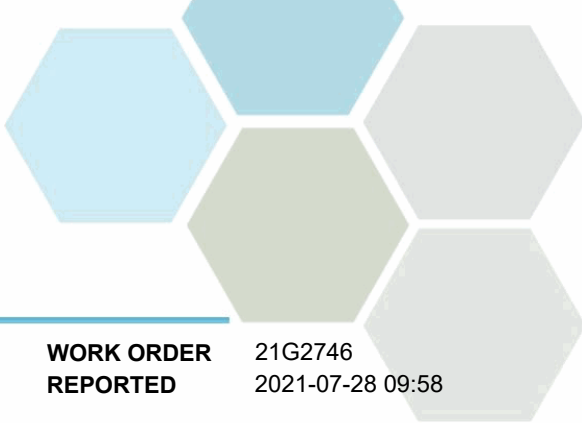
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21G2746
2021-07-28 09:58

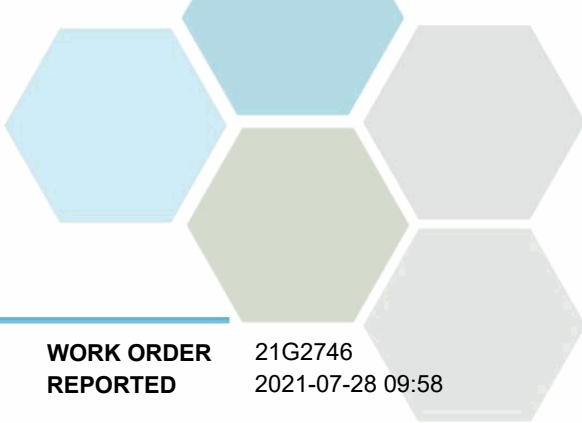
Analyte	Result	RL	Units	Analyzed	Qualifier
FPS (21G2746-01) Matrix: Solid Sampled: 2021-07-20 10:04					
<i>General Parameters</i>					
Solids, Total	8.6	0.1	% wet	2021-07-26	
Solids, Volatile	86.6	0.1	% dry	2021-07-26	
<i>Strong Acid Leachable Metals</i>					
Arsenic	3.88	0.30	mg/kg dry	2021-07-27	
Cadmium	0.889	0.040	mg/kg dry	2021-07-27	
Chromium	17.3	1.0	mg/kg dry	2021-07-27	
Cobalt	0.98	0.10	mg/kg dry	2021-07-27	
Copper	245	0.40	mg/kg dry	2021-07-27	
Lead	10.5	0.20	mg/kg dry	2021-07-27	
Mercury	0.466	0.040	mg/kg dry	2021-07-27	
Molybdenum	8.48	0.10	mg/kg dry	2021-07-27	
Nickel	10.6	0.60	mg/kg dry	2021-07-27	
Selenium	4.48	0.20	mg/kg dry	2021-07-27	
Zinc	714	2.0	mg/kg dry	2021-07-27	

FPS REP1 (21G2746-02) | Matrix: Solid | Sampled: 2021-07-20 10:04

<i>General Parameters</i>					
Solids, Total	10.8	0.1	% wet	2021-07-26	
Solids, Volatile	87.0	0.1	% dry	2021-07-26	
<i>Strong Acid Leachable Metals</i>					
Arsenic	3.77	0.30	mg/kg dry	2021-07-27	
Cadmium	0.919	0.040	mg/kg dry	2021-07-27	
Chromium	17.7	1.0	mg/kg dry	2021-07-27	
Cobalt	0.91	0.10	mg/kg dry	2021-07-27	
Copper	228	0.40	mg/kg dry	2021-07-27	
Lead	10.1	0.20	mg/kg dry	2021-07-27	
Mercury	0.583	0.040	mg/kg dry	2021-07-27	
Molybdenum	8.53	0.10	mg/kg dry	2021-07-27	
Nickel	11.5	0.60	mg/kg dry	2021-07-27	
Selenium	4.78	0.20	mg/kg dry	2021-07-27	
Zinc	713	2.0	mg/kg dry	2021-07-27	

FPS REP2 (21G2746-03) | Matrix: Solid | Sampled: 2021-07-20 10:04

<i>General Parameters</i>					
Solids, Total	9.0	0.1	% wet	2021-07-26	
Solids, Volatile	87.1	0.1	% dry	2021-07-26	
<i>Strong Acid Leachable Metals</i>					
Arsenic	3.86	0.30	mg/kg dry	2021-07-27	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21G2746
2021-07-28 09:58

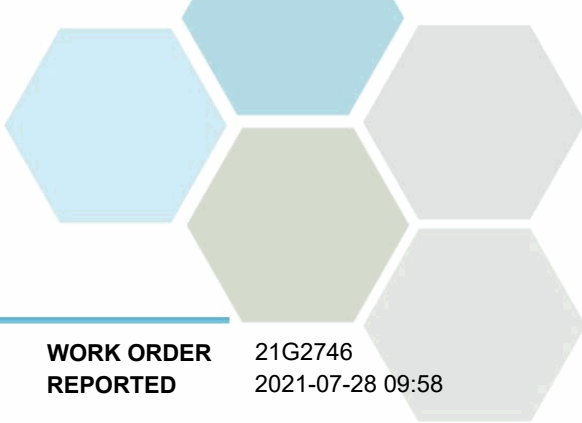
Analyte	Result	RL	Units	Analyzed	Qualifier
FPS REP2 (21G2746-03) Matrix: Solid Sampled: 2021-07-20 10:04, Continued					
<i>Strong Acid Leachable Metals, Continued</i>					
Cadmium	0.817	0.040	mg/kg dry	2021-07-27	
Chromium	350	1.0	mg/kg dry	2021-07-27	
Cobalt	1.35	0.10	mg/kg dry	2021-07-27	
Copper	240	0.40	mg/kg dry	2021-07-27	
Lead	12.0	0.20	mg/kg dry	2021-07-27	
Mercury	0.406	0.040	mg/kg dry	2021-07-27	
Molybdenum	8.84	0.10	mg/kg dry	2021-07-27	
Nickel	11.7	0.60	mg/kg dry	2021-07-27	
Selenium	4.46	0.20	mg/kg dry	2021-07-27	
Zinc	724	2.0	mg/kg dry	2021-07-27	

TWAS (21G2746-04) | Matrix: Solid | Sampled: 2021-07-20 10:09

<i>General Parameters</i>					
Solids, Total	2.3	0.1	% wet	2021-07-26	
Solids, Volatile	77.7	0.1	% dry	2021-07-26	
<i>Strong Acid Leachable Metals</i>					
Arsenic	2.59	0.30	mg/kg dry	2021-07-27	
Cadmium	0.854	0.040	mg/kg dry	2021-07-27	
Chromium	8.3	1.0	mg/kg dry	2021-07-27	
Cobalt	1.12	0.10	mg/kg dry	2021-07-27	
Copper	256	0.40	mg/kg dry	2021-07-27	
Lead	7.97	0.20	mg/kg dry	2021-07-27	
Mercury	0.206	0.040	mg/kg dry	2021-07-27	
Molybdenum	7.50	0.10	mg/kg dry	2021-07-27	
Nickel	9.56	0.60	mg/kg dry	2021-07-27	
Selenium	7.56	0.20	mg/kg dry	2021-07-27	
Zinc	568	2.0	mg/kg dry	2021-07-27	

TWAS REP1 (21G2746-05) | Matrix: Solid | Sampled: 2021-07-20 10:09

<i>General Parameters</i>					
Solids, Total	2.3	0.1	% wet	2021-07-26	
Solids, Volatile	77.4	0.1	% dry	2021-07-26	
<i>Strong Acid Leachable Metals</i>					
Arsenic	2.76	0.30	mg/kg dry	2021-07-27	
Cadmium	0.949	0.040	mg/kg dry	2021-07-27	
Chromium	9.2	1.0	mg/kg dry	2021-07-27	
Cobalt	1.12	0.10	mg/kg dry	2021-07-27	
Copper	275	0.40	mg/kg dry	2021-07-27	
Lead	8.28	0.20	mg/kg dry	2021-07-27	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21G2746
2021-07-28 09:58

Analyte	Result	RL	Units	Analyzed	Qualifier
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TWAS REP1 (21G2746-05) | Matrix: Solid | Sampled: 2021-07-20 10:09, Continued

Strong Acid Leachable Metals, Continued

Mercury	0.236	0.040	mg/kg dry	2021-07-27	
Molybdenum	8.07	0.10	mg/kg dry	2021-07-27	
Nickel	10.4	0.60	mg/kg dry	2021-07-27	
Selenium	7.93	0.20	mg/kg dry	2021-07-27	
Zinc	608	2.0	mg/kg dry	2021-07-27	

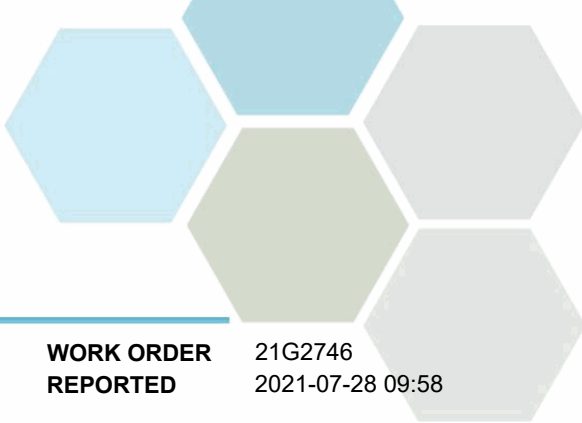
TWAS REP2 (21G2746-06) | Matrix: Solid | Sampled: 2021-07-20 10:09

General Parameters

Solids, Total	2.2	0.1	% wet	2021-07-26	
Solids, Volatile	77.3	0.1	% dry	2021-07-26	

Strong Acid Leachable Metals

Arsenic	2.69	0.30	mg/kg dry	2021-07-27	
Cadmium	0.907	0.040	mg/kg dry	2021-07-27	
Chromium	8.8	1.0	mg/kg dry	2021-07-27	
Cobalt	1.14	0.10	mg/kg dry	2021-07-27	
Copper	266	0.40	mg/kg dry	2021-07-27	
Lead	8.47	0.20	mg/kg dry	2021-07-27	
Mercury	0.226	0.040	mg/kg dry	2021-07-27	
Molybdenum	7.74	0.10	mg/kg dry	2021-07-27	
Nickel	9.90	0.60	mg/kg dry	2021-07-27	
Selenium	8.24	0.20	mg/kg dry	2021-07-27	
Zinc	593	2.0	mg/kg dry	2021-07-27	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21G2746
2021-07-28 09:58

Analysis Description	Method Ref.	Technique	Accredited	Location
SALM in Solid	BCMOE SALM V.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Solids, Total in Solid	SM 2540 G (2017)	Gravimetry		Kelowna
Solids, Volatile in Solid	SM 2540 G (2017)	Gravimetry		Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
% dry	Percent (dry weight basis)
% wet	Percent (as received basis)
mg/kg dry	Milligrams per kilogram (dry weight basis)
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J3489
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-26 16:05 / 4.0°C 2021-11-03 11:04
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP QS		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: N/A

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

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21J3489
2021-11-03 11:04

Analyte	Result	RL	Units	Analyzed	Qualifier
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TWAS (21J3489-01) | Matrix: Solid | Sampled: 2021-10-25 09:46

General Parameters

Solids, Total	2.4	0.1	% wet	2021-10-29	
Solids, Volatile	80.4	0.1	% dry	2021-10-29	

Strong Acid Leachable Metals

Arsenic	1.47	0.30	mg/kg dry	2021-11-02	
Cadmium	0.465	0.040	mg/kg dry	2021-11-02	
Chromium	3.4	1.0	mg/kg dry	2021-11-02	
Cobalt	0.54	0.10	mg/kg dry	2021-11-02	
Copper	99.6	0.40	mg/kg dry	2021-11-02	
Lead	3.38	0.20	mg/kg dry	2021-11-02	
Mercury	0.095	0.040	mg/kg dry	2021-11-02	
Molybdenum	3.45	0.10	mg/kg dry	2021-11-02	
Nickel	4.14	0.60	mg/kg dry	2021-11-02	
Selenium	2.84	0.20	mg/kg dry	2021-11-02	
Zinc	233	2.0	mg/kg dry	2021-11-02	

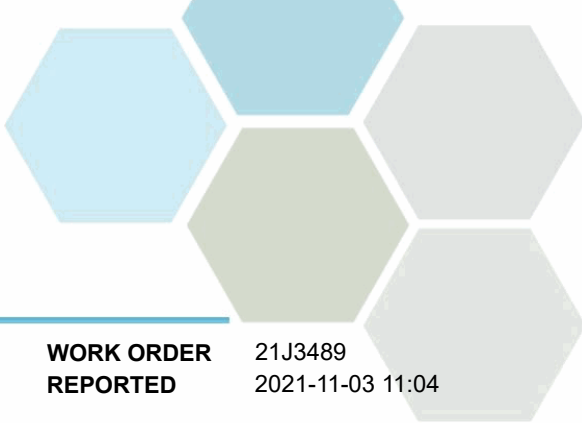
FPS (21J3489-02) | Matrix: Solid | Sampled: 2021-10-25 09:47

General Parameters

Solids, Total	5.6	0.1	% wet	2021-10-29	
Solids, Volatile	85.3	0.1	% dry	2021-10-29	

Strong Acid Leachable Metals

Arsenic	1.80	0.30	mg/kg dry	2021-11-02	
Cadmium	0.683	0.040	mg/kg dry	2021-11-02	
Chromium	9.0	1.0	mg/kg dry	2021-11-02	
Cobalt	0.49	0.10	mg/kg dry	2021-11-02	
Copper	125	0.40	mg/kg dry	2021-11-02	
Lead	6.07	0.20	mg/kg dry	2021-11-02	
Mercury	0.277	0.040	mg/kg dry	2021-11-02	
Molybdenum	4.40	0.10	mg/kg dry	2021-11-02	
Nickel	5.12	0.60	mg/kg dry	2021-11-02	
Selenium	2.33	0.20	mg/kg dry	2021-11-02	
Zinc	433	2.0	mg/kg dry	2021-11-02	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QS

WORK ORDER REPORTED 21J3489
2021-11-03 11:04

Analysis Description	Method Ref.	Technique	Accredited	Location
SALM in Solid	BCMOE SALM V.2 / EPA 6020B	HNO ₃ +HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Solids, Total in Solid	SM 2540 G (2017)	Gravimetry		Kelowna
Solids, Volatile in Solid	SM 2540 G (2017)	Gravimetry		Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
% dry	Percent (dry weight basis)
% wet	Percent (as received basis)
mg/kg dry	Milligrams per kilogram (dry weight basis)
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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APPENDIX F

Solids (TWAS and FPS) 2021 Disposal Volumes and Weights

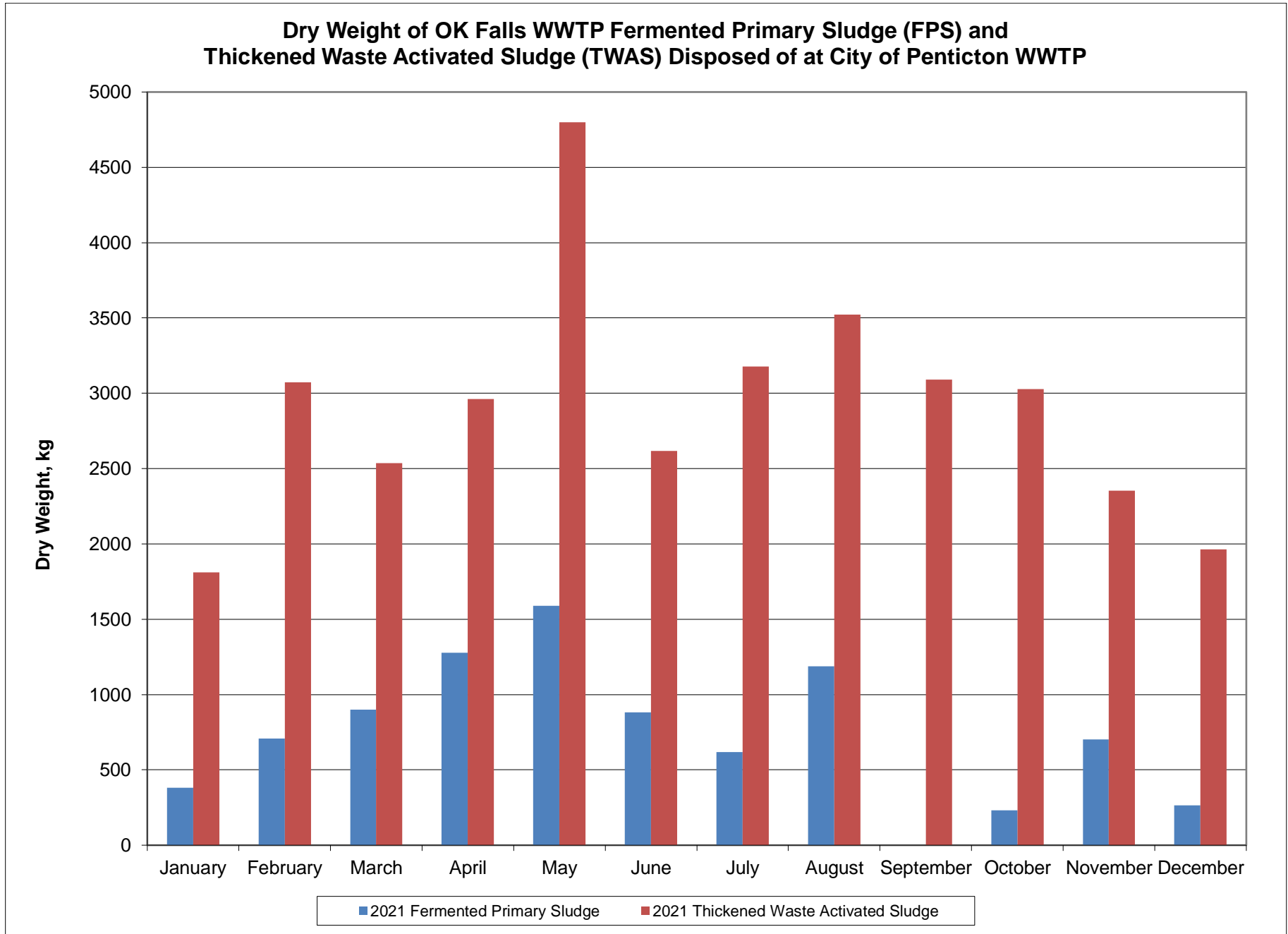
Appendix F Okanagan Falls Wastewater Treatment Facility

OK Falls WWTP Fermented Primary Sludge (FPS) Disposed of at City of Penticton WWTP

2021	Volume m ³	Density %	Dry Weight Kg
January	10.5	3.64	382.2
February	10.5	6.70	707.7
March	21.0	4.29	900.9
April	21.0	6.08	1276.8
May	24.0	6.62	1588.8
June	10.5	8.4	882.0
July	10.5	5.9	619.5
August	21.0	5.7	1186.5
September	0	0.0	0.0
October	10.0	2.3	232.0
November	10.5	7	701
December	6.8	3.9	264.5
Total	156.3		8742.3
Average	13.0	5.0	728.5

OK Falls WWTP Thickened Waste Activated Sludge (TWAS) Disposed of at City of Penticton WWTP

2021	Volume m ³	Density %	Dry Weight Kg
January	76.7	2.36	1810.1
February	124.9	2.46	3072.5
March	113.2	2.24	2535.7
April	114.8	2.58	2961.8
May	180.4	2.66	4798.6
June	109.5	2.39	2617.1
July	135.2	2.40	3177.2
August	140.9	2.50	3522.5
September	131.0	2.40	3091.6
October	117.4	2.60	3028.9
November	92.3	2.60	2353.7
December	89.7	2.19	1963.6
Total	1426.0		34933
Average	118.8	2.4	2911.1



APPENDIX G

Flows for WWTP Effluent, Wetland and Okanagan River Channel 2021

Okanagan Falls Wastewater Treatment Facility

DAILY FLOWS FROM OKANAGAN FALLS WASTEWATER TREATMENT PLANT TO RIVER AND WETLAND AND FROM WETLAND TO RIVER

Day of Month	January-21			February-21			March-21				April-21		
	From WWTP To River	Total Flow From WWTP	Total Flow To River	From WWTP To River	Total Flow From WWTP	Total Flow To River	From WWTP To River	Total Flow From WWTP	From Wetland to River	Total Flow To River	From WWTP To River	Total Flow From WWTP	Total Flow To River
1	604.8	604.8	604.8	592.8	592.8	592.8	558.7	558.7	489.5	1048.3	478.5	478.5	478.5
2	613.0	613.0	613.0	633.1	633.1	633.1	541.8	541.8	1020.3	1562.1	521.9	521.9	521.9
3	637.9	637.9	637.9	621.2	621.2	621.2	534.4	534.4	671.5	1205.9	521.0	521.0	521.0
4	590.1	590.1	590.1	579.5	579.5	579.5	519.4	519.4	74.9	594.3	559.2	559.2	559.2
5	574.8	574.8	574.8	604.8	604.8	604.8	512.9	512.9		512.9	543.5	543.5	543.5
6	568.4	568.4	568.4	626.9	626.9	626.9	541.0	541.0		541.0	458.5	458.5	458.5
7	568.7	568.7	568.7	650.8	650.8	650.8	558.8	558.8		558.8	492.3	492.3	492.3
8	573.2	573.2	573.2	630.4	630.4	630.4	523.0	523.0		523.0	497.9	497.9	497.9
9	602.8	602.8	602.8	446.5	446.5	446.5	528.7	528.7		528.7	494.2	494.2	494.2
10	605.7	605.7	605.7	608.5	608.5	608.5	517.0	517.0		517.0	541.7	541.7	541.7
11	597.2	597.2	597.2	623.7	623.7	623.7	531.4	531.4		531.4	557.0	557.0	557.0
12	606.4	606.4	606.4	614.3	614.3	614.3	529.3	529.3		529.3	514.2	514.2	514.2
13	604.7	604.7	604.7	626.6	626.6	626.6	539.0	539.0		539.0	483.8	483.8	483.8
14	588.3	588.3	588.3	603.4	603.4	603.4	542.8	542.8		542.8	485.8	485.8	485.8
15	583.4	583.4	583.4	627.7	627.7	627.7	524.3	524.3		524.3	503.3	503.3	503.3
16	599.4	599.4	599.4	560.5	560.5	560.5	520.6	520.6		520.6	494.2	494.2	494.2
17	603.4	603.4	603.4	563.3	563.3	563.3	511.6	511.6		511.6	513.2	513.2	513.2
18	594.8	594.8	594.8	588.0	588.0	588.0	507.0	507.0		507.0	550.2	550.2	550.2
19	565.6	565.6	565.6	597.8	597.8	597.8	536.1	536.1		536.1	515.6	515.6	515.6
20	570.2	570.2	570.2	590.0	590.0	590.0	537.5	537.5		537.5	499.2	499.2	499.2
21	577.6	577.6	577.6	605.2	605.2	605.2	572.6	572.6		572.6	493.0	493.0	493.0
22	579.4	579.4	579.4	582.9	582.9	582.9	524.1	524.1		524.1	514.3	514.3	514.3
23	595.1	595.1	595.1	595.3	595.3	595.3	506.9	506.9		506.9	493.7	493.7	493.7
24	646.1	646.1	646.1	573.3	573.3	573.3	497.9	497.9		497.9	524.7	524.7	524.7
25	559.2	559.2	559.2	585.8	585.8	585.8	517.1	517.1		517.1	614.2	614.2	614.2
26	544.1	544.1	544.1	545.5	545.5	545.5	507.4	507.4		507.4	533.8	533.8	533.8
27	565.1	565.1	565.1	570.9	570.9	570.9	554.6	554.6		554.6	496.0	496.0	496.0
28	589.7	589.7	589.7	629.9	629.9	629.9	562.8	562.8		562.8	502.5	502.5	502.5
29	588.0	588.0	588.0				529.1	529.1		529.1	292.4	292.4	292.4
30	582.8	582.8	582.8				511.5	511.5		511.5	516.8	516.8	516.8
31	593.0	593.0	593.0				490.6	490.6		490.6			
Total (m ³)	18273	18273	18273	16679	16679	16679	16390	16390	2256	18646	15207	15207	15207
Average (m ³)	589	589	589	596	596	596	529	529	564	601	507	507	507
min	544	544	544	447	447	447	491	491	75	491	292	292	292
max	646	646	646	651	651	651	573	573	1020	1562	614	614	614
n	31	31	31	28	28	28	31	31	4	31	30	30	30

Okanagan Falls Wastewater Treatment Facility

DAILY FLOWS FROM OKANAGAN FALLS WASTEWATER TREATMENT PLANT TO RIVER AND WETLAND AND FROM WETLAND TO RIVER

Day of Month	May-21					June-21					July-21				
	From WWTP To River	From WWTP To Wetland	Total Flow From WWTP	From Wetland to River	Total Flow To River	From WWTP To River	From WWTP To Wetland	Total Flow From WWTP	From Wetland to River	Total Flow To River	From WWTP To River	From WWTP To Wetland	Total Flow From WWTP	From Wetland to River	Total Flow To River
1	530.4		530.4		530.4	5.3	678.8	684.2	346.0	351	632.9		632.9	7.8	640.6
2	564.4		564.4		564.4	15.6	684.9	700.6	339.5	355.1	642.6		642.6		642.6
3	514.8		514.8		514.8	47.5	653.6	701.1	296.4	344.0	635.6		635.6	0.2	635.9
4	627.6		627.6		627.6	5.6	693.1	698.7	321.4	327.0	694.0		694.0	0.1	694.1
5	420.2		420.2		420.2	9.3	687.8	697.1	356.0	365.3	188.6	510.5	699.1	0.1	188.7
6	476.7		476.7		476.7	23.0	709.9	732.9	382.2	405.2	17.3	760.6	778.0		17.3
7	510.3		510.3		510.3	22.3	698.6	721.0	589.7	612.0	21.6	774.1	795.8	106.1	127.8
8	519.2		519.2		519.2	5.1	688.6	693.7	399.1	404.2	83.1	723.1	806.1	374.3	457.4
9	535.0		535.0		535.0	32.9	653.7	686.6	353.5	386.4	204.4	533.9	738.3	330.6	535.0
10	281.5	298.7	580.2		281.5	2.0	299.8	301.8	224.5	226.5	347.9	372.6	720.5	149.6	497.5
11	2.6	675.9	678.5		2.6	23.7	675.3	699.1	191.0	214.7	335.8	341.8	677.5	93.6	429.4
12	0.5	676.7	677.2		0.5	15.4	683.7	699.1	338.7	354.2	371.2	299.7	670.9	75.2	446.4
13	1.9	670.0	671.9		1.9	20.5	732.4	752.9	447.6	468.1	313.7	340.6	654.3	69.7	383.4
14	228.1	429.9	658.0		228.1	49.1	698.8	748.0	556.7	605.8	337.6	344.6	682.3	71.2	408.8
15	514.7		514.7		514.7	7.2	709.7	716.9	464.6	471.8	319.7	341.9	661.7	68.1	387.8
16	533.4		533.4		533.4	44.1	728.0	772.2	421.7	465.8	340.7	346.3	687.0	65.7	406.3
17	158.2	433.7	591.9	109.0	267.1	325.2	412.7	737.9	387.8	713.0	335.3	341.6	677.0	64.4	399.7
18	0.4	675.7	676.1	65.0	65.4	660.2	0.0	660.2	71.5	731.7	393.4	334.0	727.4	63.0	456.3
19	4.1	661.2	665.3	150.2	154.3	661.1	0.0	661.1	0.5	661.6	344.3	348.7	693.0	62.3	406.5
20	7.1	680.5	687.6	371.1	378.2	705.3	0.0	705.3	0.3	705.6	313.8	384.0	697.8	80.2	394.0
21	39.0	623.4	662.5	345.9	385.0	240.1	510.3	750.4	17.5	257.6	351.0	393.2	744.2	97.5	448.5
22	4.5	657.9	662.4	354.2	358.7	15.4	719.2	734.7	56.4	71.8	348.9	386.7	735.6	100.6	449.5
23	5.9	668.4	674.3	370.7	376.6	9.1	726.8	735.9	269.2	278.2	360.4	382.3	742.7	107.6	468.0
24	21.3	696.3	717.6	427.9	449.2	11.0	728.6	739.6	346.9	357.9	401.9	381	782.4	102.9	504.8
25	27.3	662.6	690.0	429.0	456.3	12.8	711.5	724.3	323.6	336.5	454.9	344	798.6	103.7	558.6
26	2.5	675.0	677.5	397.5	400.0	13.9	746.5	760.5	377.5	391.5	406.6	368	774.3	93.1	499.8
27	53.1	623.4	676.5	387.1	440.2	35.2	755.7	790.8	368.7	403.9	394.7	368	762.8	92.7	487.5
28	2.0	688.5	690.5	391.7	393.7	14.1	747.1	761.2	378.8	393.0	379.2	368.1	747.3	96.7	476.0
29	8.0	684.9	692.9	373.2	381.2	15.9	748.7	764.7	362.4	378.4	377.8	354.0	731.8	107.0	484.8
30	10.5	702.9	713.5	398.0	408.5	430.6	279.0	709.6	262.3	692.8	389.8	347.9	737.7	100.6	490.4
31	31.3	628.5	659.8	328.1	359.4						419.2	360.4	779.6	123.1	542
Total (m ³)	6637	12514	19151	4898	11535	3479	17763	21242	9252	12731	11158	11151	22309	2808	13966
Average (m ³)	214	626	618	327	372	116	592	708	308	424	360	413	720	97	451
min	0.4	299	420	65	1	2	0	302	0	72	17	300	633	0	17
max	628	703	718	429	628	705	756	791	590	732	694	774	806	374	694
n	31	20	31	15	31	30	30	30	30	30	31	27	31	29	31

DAILY FLOWS FROM OKANAGAN FALLS WASTEWATER TREATMENT PLANT TO RIVER AND WETLAND AND FROM WETLAND TO RIVER

Day of Month	August-21					September-21					October-21				
	From WWTP To River	From WWTP To Wetland	Total Flow From WWTP	From Wetland to River	Total Flow To River	From WWTP To River	From WWTP To Wetland	Total Flow From WWTP	From Wetland to River	Total Flow To River	From WWTP To River	From WWTP To Wetland	Total Flow From WWTP	From Wetland to River	Total Flow To River
1	393.9	356.8	750.7	168.6	562.5	3.6	695.8	699.4	420.1	423.6	17.3	614.5	631.8	430.7	448.0
2	453.0	353.4	806.4	178.1	631.2	2.4	682.6	685.0	415.5	417.9	3.0	596.4	599.4	391.2	394.2
3	424.4	338.7	763.1	149.5	573.9	271.8	365.5	637.3	308.1	579.9	7.8	655.2	663.0	419.8	427.6
4	411.4	337.8	749.2	114.0	525.4	165.8	513.1	679.0	160.6	326.4	4.7	649.6	654.3	434.4	439.1
5	432.1	336.5	768.6	104.2	536.3	29.3	718.5	747.8	451.3	480.6	11.4	651.1	662.4	425.9	437.2
6	400.4	309.7	710.1	101.2	501.6	20.9	681.7	702.6	428.8	449.7	30.5	507.3	537.7	340.9	371.4
7	349.1	335.0	684.1	137.2	486.2	1.8	656.9	658.6	389.3	391.1	2.4	559.2	561.6	327.6	330.0
8	389.6	342.1	731.7	294.1	683.7	5.4	654.1	659.5	389.2	394.6	3.0	595.2	598.2	378.0	381.0
9	388.8	335.8	724.6	152.9	541.7	6.6	647.6	654.1	361.8	368.4	9.0	624.0	633.0	375.7	384.7
10	185.0	592.6	777.6	202.7	387.7	3.0	619.9	622.9	359.4	362.4	22.1	627.0	649.1	405.2	427.3
11	217.3	609.4	826.7	338.8	556.1	12.0	659.5	671.4	419.0	431.0	16.1	657.8	673.9	425.1	441.2
12	131.5	671.5	803.0	350.6	482.1	23.9	639.3	663.2	402.0	425.9	9.0	616.8	625.7	415.2	424.2
13	132.1	673.1	805.2	395.1	527.1	385.8	136.3	522.1	235.3	621.1	272.6	278.8	551.5	373.8	646.4
14	162.3	655.3	817.6	371.6	533.9	82.8	496.1	578.9	91.4	174.2	401.4	0.2	401.6	39.7	441.1
15	193.9	651.0	844.9	359.1	553.0	72.3	526.3	598.6	305.0	377.3	504.7	1.0	505.7	313.3	818.0
16	159.1	609.6	768.7	403.1	562.1	144.0	529.3	673.4	314.5	458.5	474.3		474.3	368.6	842.9
17	92.6	600.8	693.4	351.2	443.8	451.1	190.3	641.4	227.3	678.4	508.1		508.1	432.1	940.2
18	63.9	750.2	814.2	469.4	533.3	510.3	0.0	510.3	20.1	530.4	439.9	2.0	442.0	397.3	837.2
19	52.6	685.1	737.7	441.2	493.7	563.5	0.0	563.5	31.6	595.1	416.9	1.5	418.5	425.0	841.9
20	40.0	695.5	735.5	445.3	485.4	301.0	285.8	586.8	35.2	336.2	417.4		417.4	486.4	903.7
21	44.8	673.6	718.4	450.4	495.2	6.6	654.8	661.4	382.8	389.4	409.6	1.3	410.9	420.2	829.8
22	39.4	728.2	767.7	452.9	492.4	14.3	660.5	674.9	460.1	474.5	492.2	1.2	493.4	329.1	821.3
23	40.6	665.4	706.0	422.5	463.2	19.6	615.2	634.8	415.5	435.1	443.2		443.2	271.9	715.1
24	55.5	613	668.3	383.1	438.6	19.2	591	610.1	387.5	406.7	489.1		489.1	165.2	654.3
25	13.1	679	692.2	419.9	433.0	21.1	617	638.4	389.5	410.6	425.6		425.6	158.9	584.6
26	15.5	660	675.5	409.0	424.6	9.0	628	637.3	394.9	403.9	429.2		429.2	91.1	520.3
27	307.1	320	627.0	369.2	676.3	34.6	548	582.3	386.8	421.4	426.3	1.5	427.8	61.3	487.6
28	650.7		650.7	21.1	671.8	53.2	502.2	555.4	301.4	354.6	394.1	0.5	394.6	96.2	490.3
29	717.6		717.6		717.6	10.2	618.2	628.4	410.3	420.5	440.9	0.5	441.4	108.9	549.7
30	162.4	535.0	697.4	3.0	165.4	3.0	637.2	640.2	434.5	437.5	431.2		431.2	67.5	498.7
31	4.8	684.4	689.2	234.4	239						457.9		457.9	40.3	498.2
Total (m ³)	7125	15798	22923	8693	15818	3248	15771	19019	9729	12977	8411	7643	16053	9416	17827
Average (m ³)	230	545	739	290	510	108	526	634	324	433	271	347	518	304	575
min	5	310	627	3	165	2	0	510	20	174	2	0	395	40	330
max	718	750	845	469	718	563	719	748	460	678	508	658	674	486	940
n	31	29	31	30	31	30	30	30	30	30	31	22	31	31	31

DAILY FLOWS FROM OKANAGAN FALLS WASTEWATER TREATMENT PLANT TO RIVER AND WETLAND AND FROM WETLAND TO RIVER

Day of Month	Nov-21				Dec-21			2021 Annual Summary						
	From WWTP To River	Total Flow From WWTP	From Wetland to River	Total Flow To River	From WWTP To River	Total Flow From WWTP	Total Flow to River	Annual From WWTP To River	Annual From WWTP To Wetland	Annual Total Flow From WWTP	Annual From Wetland to River	Annual Total Flow To River	Reduction in flow to River because of wetland	Percent reduction in flow to River because of wetland
1	322.6	322.6	24.7	347.3	409.5	409.5	409.5							
2	319.0	319.0	28.7	347.7	410.7	410.7	410.7							
3	381.1	381.1	69.0	450.1	410.5	410.5	410.5							
4	427.3	427.3	67.2	494.5	429.3	429.3	429.3							
5	427.1	427.1	62.6	489.7	466.4	466.4	466.4							
6	452.7	452.7	35.5	488.2	445.0	445.0	445.0							
7	484.8	484.8	24.2	509.0	409.5	409.5	409.5							
8	452.5	452.5	19.1	471.6	412.8	412.8	412.8							
9	441.7	441.7	17.6	459.3	415.7	415.7	415.7							
10	357.5	357.5	17.4	374.9	418.9	418.9	418.9							
11	464.9	464.9	10.0	474.9	462.0	462.0	462.0							
12	463.1	463.1	30.7	493.8	447.1	447.1	447.1							
13	483.1	483.1	37.4	520.5	464.5	464.5	464.5							
14	472.3	472.3	46.9	519.1	438.7	438.7	438.7							
15	464.6	464.6	125.4	590.1	443.4	443.4	443.4							
16	408.7	408.7	46.9	455.6	439.4	439.4	439.4							
17	415.5	415.5	8.6	424.0	437.0	437.0	437.0							
18	424.5	424.5	10.6	435.1	462.6	462.6	462.6							
19	403.0	403.0	30.7	433.7	472.3	472.3	472.3							
20	433.5	433.5	8.1	441.6	457.4	457.4	457.4							
21	454.3	454.3	14.1	468.4	462.6	462.6	462.6							
22	421.6	421.6	12.7	434.2	437.1	437.1	437.1							
23	412.4	412.4	30.7	443.1	439.2	439.2	439.2							
24	425.3	425.3	26.2	451.6	457.3	457.3	457.3							
25	424.1	424.1	26.2	450.3	474.2	474.2	474.2							
26	421.9	421.9	10.6	432.5	476.4	476.4	476.4							
27	436.3	436.3	8.6	444.9	547.5	547.5	547.5							
28	472.6	472.6	16.1	488.8	565.6	565.6	565.6							
29	436.1	436.1	12.1	448.2	584.5	584.5	584.5							
30	427.1	427.1	16.3	443.5	564.8	564.8	564.8							
31					560.7	560.7	560.7							
Total (m ³)	12831	12831	895	13726	14323	14323	14323	133759	80639	214399	47948	181707	32691	15%
Average (m ³)	428	428	30	458	462	462	462	366	510	587	241	498		
min	319	319.0	8	347	409	409	409	0	0	845	0	1		
max	485	485	125	590	585	585	585	718	774	0	1020	1562		
n	30	30	30	30	31	31	31	365	158	0	199	365		

Okanagan Falls Wastewater Treatment Facility

DAILY FLOWS AND DILUTION FACTOR FOR OKANAGAN RIVER (STATION 08NM002) AND FOR OKANAGAN FALLS WASTEWATER TREATMENT PLANT

2021	January			February			March			April		
Day of the Month	Okanagan River Flows (Station 08NM002) ¹ m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) ¹ m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) ¹ m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) ¹ m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²
1	951526	604.8	1574	1056401	592.8	1783	1941540	1048.3	1850	1936657	478.5	4048
2	954692	613.0	1558	1129574	633.1	1785	1938710	1562.1	1240	1936475	521.9	3711
3	957453	637.9	1502	1187213	621.2	1912	1934741	1205.9	1602	1936130	521.0	3717
4	958040	590.1	1624	1182830	579.5	2042	1931029	594.3	3246	1935950	559.2	3455
5	959398	574.8	1670	1182520	604.8	1956	1928369	512.9	3757	1931360	543.5	3555
6	962437	568.4	1694	1179603	626.9	1883	1926638	541.0	3545	1931830	458.5	4208
7	962074	568.7	1693	1175549	650.8	1807	1917045	558.8	3421	1929166	492.3	3912
8	964066	573.2	1683	1376549	630.4	2185	1910714	523.0	3650	1925324	497.9	3865
9	963979	602.8	1600	1549756	446.5	3472	1908306	528.7	3608	1923997	494.2	3891
10	963963	605.7	1593	1546096	608.5	2542	1907000	517.0	3109	1922603	541.7	3549
11	963644	597.2	1615	1536459	623.7	2465	1606739	531.4	2563	1922012	557.0	3447
12	964091	606.4	1591	1528079	614.3	2489	1361649	529.3	2575	1919236	514.2	3737
13	966963	604.7	1600	1524411	626.6	2434	1362325	539.0	2529	1921208	483.8	3970
14	965657	588.3	1642	1522800	603.4	2525	1362579	542.8	2180	1920422	485.8	3946
15	966161	583.4	1657	1523077	627.7	2427	1183008	524.3	1985	1916338	503.3	3810
16	965969	599.4	1613	1522791	560.5	2718	1040361	520.6	2001	1917113	494.2	3879
17	967293	603.4	1604	1523714	563.3	2706	1041055	511.6	2044	1916566	513.2	3738
18	969280	594.8	1631	1521614	588.0	2589	1045239	507.0	2067	1917851	550.2	3485
19	967534	565.6	1712	1522299	597.8	2548	1047474	536.1	1954	1916840	515.6	3727
20	970104	570.2	1702	1522747	590.0	2582	1047202	537.5	1947	1920832	499.2	3858
21	971721	577.6	1683	1524043	605.2	2519	1046031	572.6	1831	1925338	493.0	3920
22	968860	579.4	1673	1524998	582.9	2617	1047840	524.1	2004	1932055	514.3	3765
23	967636	595.1	1627	1706679	595.3	2868	1049628	506.9	1933	1935584	493.7	3938
24	966730	646.1	1497	1851504	573.3	3231	979083	497.9	2119	1943848	524.7	3739
25	967773	559.2	1732	1905089	585.8	3253	1054462	517.1	2040	1961273	614.2	3214
26	968659	544.1	1781	1957324	545.5	3589	1054332	507.4	2081	1973238	533.8	3701
27	971248	565.1	1720	1953809	570.9	3423	1055400	554.6	1905	1975065	496.0	3972
28	1006176	589.7	1707	1944760	629.9	3089	1055860	562.8	1875	1969695	502.5	3958
29	1058158	588.0	1801				1054484	529.1	2467	1988277	292.4	6890
30	1056313	582.8	1814				1304645	511.5	3423	2014303	516.8	3940
31	1056548	593.0	1783				1750166	490.6	3949			
TOTAL	30224147	18273		42182289	16679		43793656	18646		58116587	15207	
AVERAGE	974972	589.5	1657	1506510	595.7	2551	1412699	601.5	2468	1937220	506.9	3885
MINIMUM	951526	544.1	1497	1056401	446.5	1783	979083	490.6	1240	1916338	292.4	3214
MAXIMUM	1058158	646.1	1814	1957324	650.8	3589	1941540	1562.1	3949	2014303	614.2	6890

¹ Data received from Environment Canada with the following qualification "Data is unapproved and subject to revision ."

July 26 to 28 flows estimated by RDOS since no data provided for these two days by averaging flows before and after these dates.

² Dilution Factor = (OK River flow + WWTP flow)/ WWTP flow

Okanagan Falls Wastewater Treatment Facility

DAILY FLOWS AND DILUTION FACTOR FOR OKANAGAN RIVER (STATION 08NM002) AND FOR OKANAGAN FALLS WASTEWATER TREATMENT PLANT

2021	May			June			July			August		
Day of the Month	Okanagan River Flows (Station 08NM002) 1 m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) 1 m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) 1 m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) 1 m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²
1	2035952	530.4	3876	2427676	351.3	6911	1139375	640.6	1775	1026417	562.5	1829
2	2055246	564.4	3666	2427658	355.1	6106	1136276	642.6	1761	1028105	631.2	1632
3	2068795	514.8	5220	2168132	344.0	5551	1131229	635.9	1780	1029101	573.9	1797
4	2686661	627.6	4941	1908961	327.0	5812	1131179	694.1	1626	1030506	525.4	1957
5	3100496	420.2	7364	1900178	365.3	5160	1127630	188.7	5973	1027779	536.3	1916
6	3094050	476.7	6486	1884535	405.2	4655	1127081	17.3	64719	1026906	501.6	2039
7	3091165	510.3	6040	1885842	612.0	3089	1121701	127.8	8802	1022441	486.2	2108
8	3081896	519.2	5929	1889767	404.2	4672	1124393	457.4	2465	1024263	683.7	1505
9	3078180	535.0	5735	1887882	386.4	4879	1126912	535.0	2104	1028236	541.7	1905
10	3067661	281.5	10872	1884962	226.5	8289	1125232	497.5	2260	1031152	387.7	2659
11	3060143	2.6	1168314	1877262	214.7	8722	1123746	429.4	2620	1030465	556.1	1850
12	3040580	0.5	6077248	1872656	354.2	5284	1124307	446.4	2500	1028189	482.1	2125
13	3041591	1.9	1594906	1870973	468.1	4008	1115560	383.4	2890	1023796	527.1	1946
14	3033279	228.1	13316	1875704	605.8	3096	1107786	408.8	2604	1025291	533.9	1926
15	3036929	514.7	5911	1875260	471.8	3976	1064243	387.8	2652	1027522	553.0	1852
16	3041897	533.4	5726	1875435	465.8	4027	1028250	406.3	2532	1023430	562.1	1816
17	3053358	267.1	10237	1875081	713.0	2633	1028441	399.7	2578	1020418	443.8	2290
18	2734536	65.4	37693	1876423	731.7	2567	1030012	456.3	2256	1015869	533.3	1907
19	2463855	154.3	15944	1877348	661.6	2836	1028878	406.5	2532	1016665	493.7	2057
20	2459436	378.2	6504	1875723	705.6	2656	1028904	394.0	2612	1015145	485.4	2085
21	2459001	385.0	6373	1873318	257.6	6002	1028745	448.5	2290	1011626	495.2	2049
22	2453136	358.7	6821	1546017	71.8	18370	1026711	449.5	2285	1014175	492.4	2051
23	2445943	376.6	6478	1319064	278.2	4749	1026663	468.0	2194	1009467	463.2	2175
24	2439008	449.2	5433	1321031	357.9	3682	1026578	504.8	2035	1006734	438.6	2295
25	2440502	456.3	5344	1317411	336.5	3902	1026588	558.6	1841	1006103	433.0	2325
26	2438239	400.0	6086	1312620	391.5	3352	1028024	499.8	2057	1006216	424.6	2369
27	2433887	440.2	5532	1311713	403.9	3242	1027594	487.5	2109	1005526	676.3	1486
28	2434570	393.7	6180	1309125	393.0	3327	1027526	476.0	2171	1004134	671.8	1495
29	2432504	381.2	6375	1307005	378.4	3181	1032651	484.8	2123	1003432	717.6	1398
30	2429759	408.5	5942	1203183	692.8	1646	1028740	490.4	2097	1002523	165.4	6046
31	2426992	359.4	6756				1028073	542.4	1894	1000060	239.1	4180
TOTAL	83159248	11535		52837945	12731		33279028	13966		31571691	15818	
AVERAGE	2682556	372.1	292363	1761265	424.4	4879	1073517	450.5	4585	1018442	510.3	2163
MINIMUM	2035952	0.5	3666	1203183	71.8	1646	1026578	17.3	1626	1000060	165.4	1398
MAXIMUM	3100496	627.6	6077248	2427676	731.7	18370	1139375	694.1	64719	1031152	717.6	6046

¹Data received from Environment Canada with the following qualification "Data is unapproved and subject to revision."

July 26 to 28 flows estimated by RDOS since no data provided for these two days by averaging flows before and after these dates.

²Dilution Factor = (OK River flow + WWTP flow)/ WWTP flow

Okanagan Falls Wastewater Treatment Facility

DAILY FLOWS AND DILUTION FACTOR FOR OKANAGAN RIVER (STATION 08NM002) AND FOR OKANAGAN FALLS WASTEWATER TREATMENT PLANT

2021	September			October			November			December		
	Okanagan River Flows (Station 08NM002) 1 m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) 1 m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) 1 m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²	Okanagan River Flows (Station 08NM002) 1 m3/day	Flows to Okanagan River from WWTP and Wetland m3/day	Dilution Factor ²
1	999360	423.6	2362	963566	448.0	2146	680247	347.3	1567	501705	409.5	1223
2	1000074	417.9	2389	961253	394.2	2442	543895	347.7	1515	500494	410.7	1215
3	998051	579.9	1722	962451	427.6	2252	526336	450.1	1171	498590	410.5	1219
4	998076	326.4	3059	962503	439.1	2194	526888	494.5	1062	499914	429.3	1163
5	997893	480.6	2074	962983	437.2	2202	524659	489.7	1070	498935	466.4	1074
6	996507	449.7	2214	962528	371.4	2425	523638	488.2	1071	500335	445.0	1126
7	995375	391.1	2544	900406	330.0	2493	522221	509.0	1025	500478	409.5	1224
8	994255	394.6	2521	822496	381.0	2097	521098	471.6	1101	500678	412.8	1213
9	994574	368.4	2684	798717	384.7	2080	518636	459.3	1128	500334	415.7	1203
10	988160	362.4	2723	799811	427.3	1863	517510	374.9	1379	499612	418.9	1196
11	986429	431.0	2288	795644	441.2	1796	516559	474.9	1086	500453	462.0	1085
12	985644	425.9	2313	791882	424.2	1872	515260	493.8	1044	500827	447.1	1123
13	984773	621.1	1581	793606	646.4	1226	515188	520.5	994	501551	464.5	1083
14	981168	174.2	5639	791865	441.1	1795	516675	519.1	997	502788	438.7	1145
15	981936	377.3	2586	791284	818.0	967	516824	590.1	875	501965	443.4	1134
16	975359	458.5	2111	790413	842.9	938	515493	455.6	1129	502414	439.4	1140
17	967240	678.4	1435	789542	940.2	839	513870	424.0	1212	500301	437.0	1146
18	972655	530.4	1844	788031	837.2	940	513539	435.1	1181	500570	462.6	1085
19	977271	595.1	1644	786519	841.9	935	513397	433.7	1177	501281	472.3	1058
20	977905	336.2	2903	786262	903.7	872	510002	441.6	1154	499145	457.4	1088
21	975638	389.4	2503	786743	829.8	954	509027	468.4	1085	497163	462.6	1076
22	974305	474.5	2055	790638	821.3	968	507725	434.2	1169	497424	437.1	1147
23	974501	435.1	2237	793839	715.1	1111	507259	443.1	1140	500836	439.2	1144
24	973042	406.7	2395	793770	654.3	1215	504856	451.6	1116	502023	457.3	1097
25	973623	410.6	2371	794308	584.6	1357	503336	450.3	1119	501267	474.2	1036
26	973263	403.9	2406	792806	520.3	1528	503433	432.5	1166	490682	476.4	963
27	971218	421.4	2301	794594	487.6	1641	503822	444.9	1132	458371	547.5	930
28	969250	354.6	2718	799778	490.3	1643	503260	488.8	1027	508568	565.6	882
29	963380	420.5	2289	805106	549.7	1461	501552	448.2	1120	498087	584.5	848
30	962130	437.5	2203	802765	498.7	1608	501381	443.5	1132	495239	564.8	877
31				801330	498.2	1366				494717	560.7	884
TOTAL	29463055	12977		25757440	17827		15597588	13726		15456747	14323	
AVERAGE	982102	432.6	2404	830885	575.1	1588	519920	457.5	1138	498605	462.0	1091
MINIMUM	962130	174.2	1435	786262	330.0	839	501381	347.3	875	458371	409.5	848
MAXIMUM	1000074	678.4	5639	963566	940.2	2493	680247	590.1	1567	508568	584.5	1224

¹ Data received from Environment Canada with the following qualification "Data is unapproved and subject to revision."

July 26 to 28 flows estimated by RDOS since no data provided for these two days by averaging flows before and after these dates.

² Dilution Factor = (OK River flow + WWTP flow) / WWTP flow

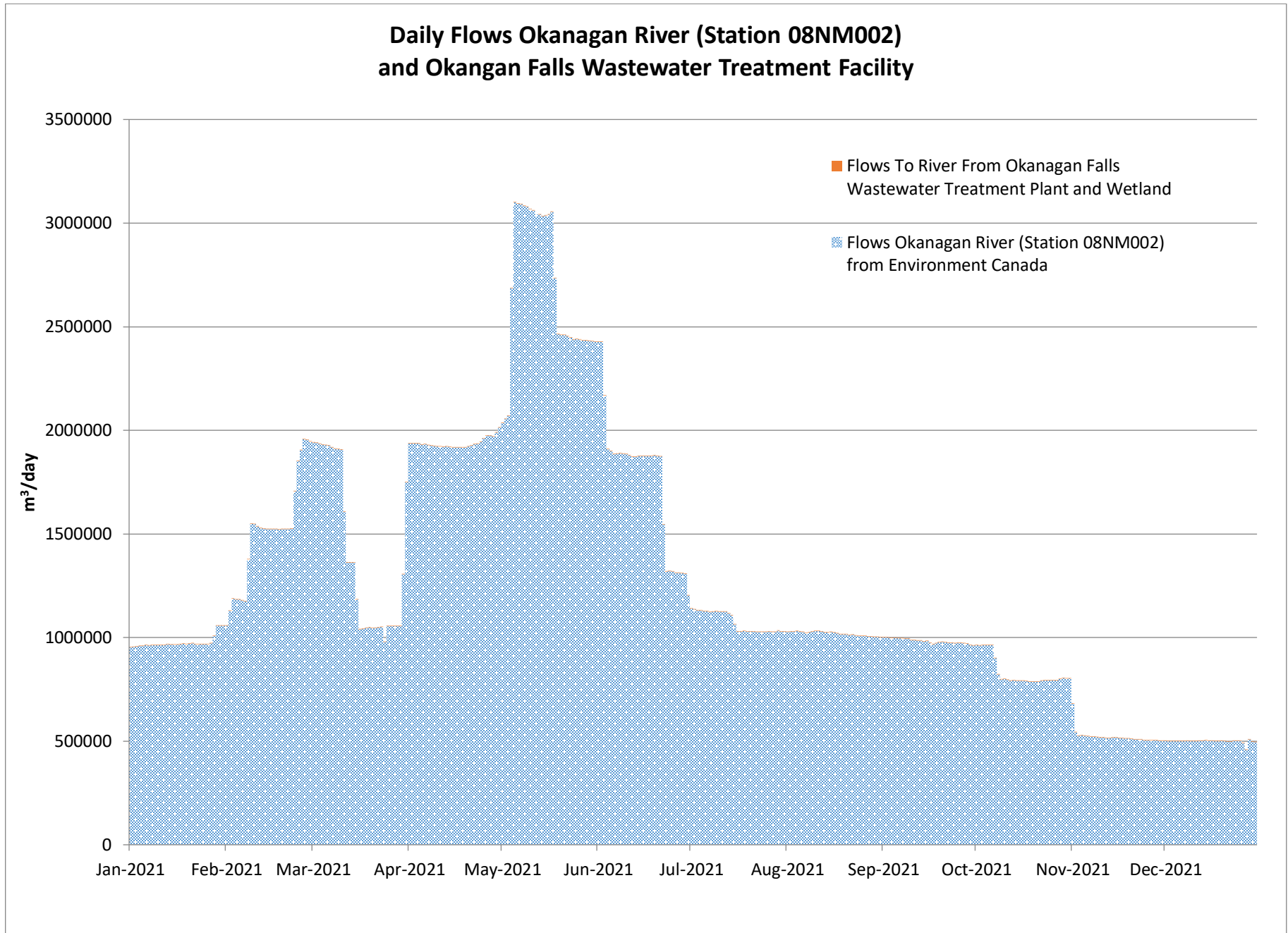
APPENDIX G

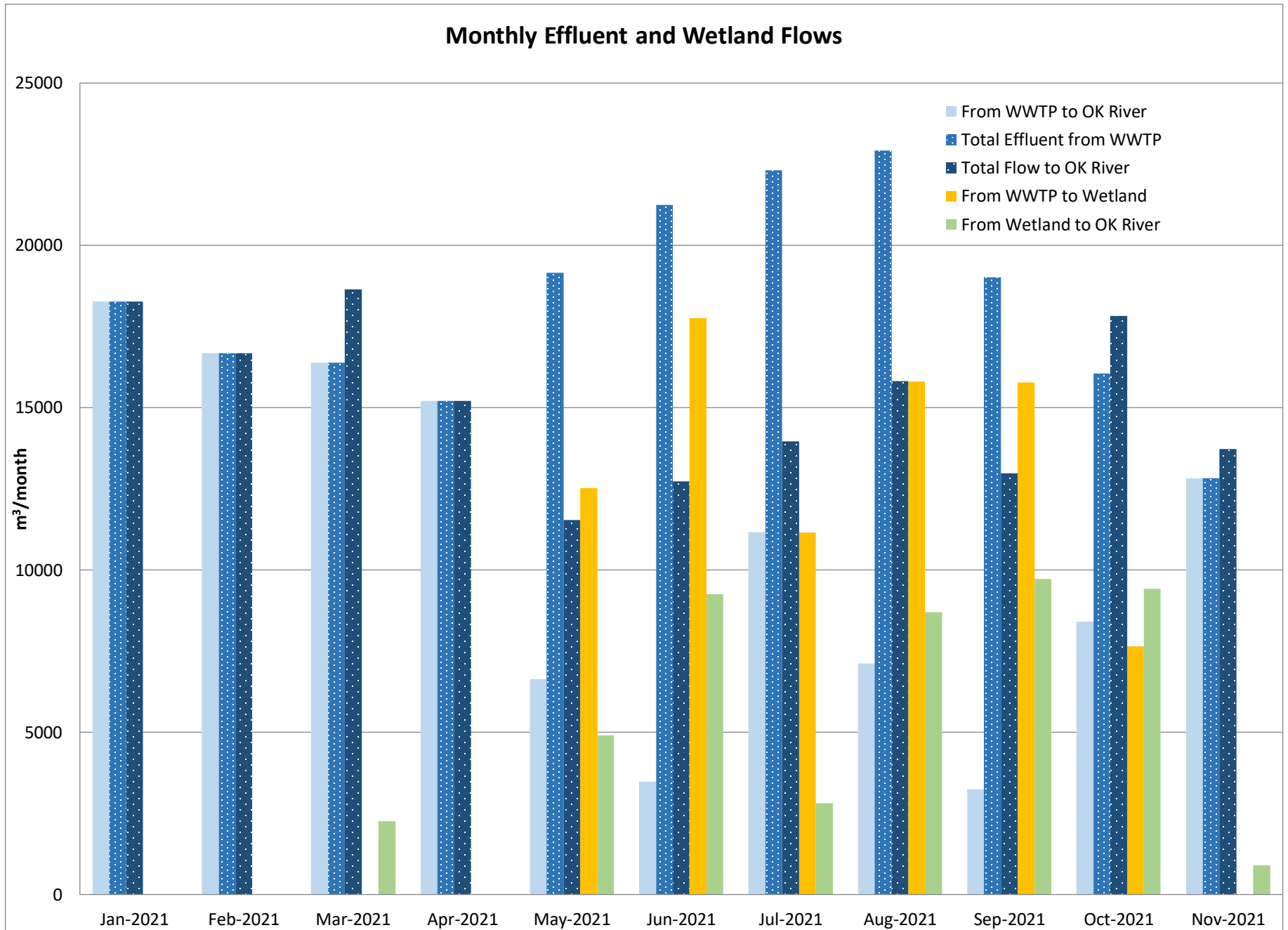
Okanagan Falls Wastewater Treatment Facility

DAILY EFFLUENT FLOW MEASUREMENTS TO OKANAGAN RIVER FROM WWTP AND WETLAND

Day of Month	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
1	605	593	1048	478	530	351	641	563	424	448	347	409
2	613	633	1562	522	564	355	643	631	418	394	348	411
3	638	621	1206	521	515	344	636	574	580	428	450	410
4	590	579	594	559	628	327	694	525	326	439	495	429
5	575	605	513	544	420	365	189	536	481	437	490	466
6	568	627	541	459	477	405	17	502	450	371	488	445
7	569	651	559	492	510	612	128	486	391	330	509	409
8	573	630	523	498	519	404	457	684	395	381	472	413
9	603	447	529	494	535	386	535	542	368	385	459	416
10	606	609	517	542	281	227	498	388	362	427	375	419
11	597	624	531	557	3	215	429	556	431	441	475	462
12	606	614	529	514	1	354	446	482	426	424	494	447
13	605	627	539	484	2	468	383	527	621	646	521	465
14	588	603	543	486	228	606	409	534	174	441	519	439
15	583	628	524	503	515	472	388	553	377	818	590	443
16	599	561	521	494	533	466	406	562	459	843	456	439
17	603	563	512	513	267	713	400	444	678	940	424	437
18	595	588	507	550	65	732	456	533	530	837	435	463
19	566	598	536	516	154	662	407	494	595	842	434	472
20	570	590	537	499	378	706	394	485	336	904	442	457
21	578	605	573	493	385	258	449	495	389	830	468	463
22	579	583	524	514	359	72	450	492	474	821	434	437
23	595	595	507	494	377	278	468	463	435	715	443	439
24	646	573	498	525	449	358	505	439	407	654	452	457
25	559	586	517	614	456	336	559	433	411	585	450	474
26	544	546	507	534	400	391	500	425	404	520	433	476
27	565	571	555	496	440	404	487	676	421	488	445	548
28	590	630	563	503	394	393	476	672	355	490	489	566
29	588		529	292	381	378	485	718	420	550	448	585
30	583		511	517	408	693	490	165	438	499	443	565
31	593		491		359		542	239		498		561
Total (m³)	18,273	16,679	18,646	15,207	11,535	12,731	13,966	15,818	12,977	17,827	13,726	14,323
Average (m³)	589	596	601	507	372	424	451	510	433	575	458	462

FLOWS AND DILUTION FACTOR FOR OKANAGAN RIVER (STATION 08NM002) AND FOR OKANAGAN FALLS WASTEWATER TREATMENT PLANT			
2021	River	Effluent WWTP and Wetland	Dilution
Annual Total, m ³	461,439,419.2	181707.3	
Annual Average, m ³	1,264,217.6	497.8	27,261
Annual Minimum, m ³	458,371.4	0.5	839
Annual Maximum, m ³	3,100,496.4	1562.1	6,077,248





APPENDIX H

Effluent Water Quality Monitoring Database Summary 2021

Appendix H

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results
Field Results							
Reading Type: Online Instrument							
pH - 24 hour average 0:00 to 24:00hr		6.92	6.41	7.14	0.08	365	365
Temperature - 24 hour average 0:00 to 24:00 hr	°C	16.3	8.4	23.7	4.5	365	365
pH - when sample collected		6.93	6.79	7.1	0.08	54	54
Temperature - when sample collected		16.6	8.7	23.6	4.4	54	54
Lab Results							
General							
Alkalinity (bicarbonate, as CaCO ₃)	mg/L	253	246	259	5	6	6
Alkalinity (carbonate, as CaCO ₃)	mg/L					6	0
Alkalinity (hydroxide, as CaCO ₃)	mg/L					6	0
Alkalinity (phenolphthalein, as CaCO ₃)	mg/L					6	0
Alkalinity (total, as CaCO ₃)	mg/L	253	246	259	5	6	6
Biochemical oxygen demand	mg/L	1.8	<1.0	6.1	1.6	11	8
5-d Carbonaceous BOD	mg/L	2.7	<1.0	6.3	1.9	12	8
Chemical Oxygen Demand	mg/L	30	13	52	9	54	54
Chloride	mg/L	118	102	128	9	6	6
Conductivity	µS/cm	908	798	954	56	6	6
Fluoride	mg/L	0.17	0.14	0.21	0.03	6	6
Hardness, Total (total as CaCO ₃)	mg/L	239	218	257	15	6	6
pH		7.71	7.1	7.97	0.22	14	14
Sulphate	mg/L	48.2	46.6	50.7	1.6	6	6
Total suspended solids	mg/L	1.4	2	4	0.8	54	12
UV transmittance at 254 nm - filtered	%	68.8	61.1	74.7	3	54	54
Microbiological							
E. coli (MPN)	MPN/100 mL	1	1	6	1	54	9
Fecal coliforms (MPN)	MPN/100 mL	1	1	28	4	54	13
Toxicity							
Mortality, 96 hour, Rainbow Trout	%	0	0	0		1	1
Nutrients							
Ammonia (total, as N)	mg/L	0.48	0.08	3.88	0.645	54	54
Nitrate (as N)	mg/L	1.687	<0.010	4.11	1.054	54	53
Nitrite (as N)	mg/L	0.071	0.01	0.261	0.067	54	48
Total nitrogen	mg/L	3.37	1.47	5.67	1.12	14	14
Total kjeldahl nitrogen	mg/L	1.62	1.07	2.68	0.52	14	14
Total organic nitrogen	mg/L	1.34	1.01	1.68	0.21	8	8
Orthophosphate (dissolved, as P)	mg/L	0.0251	0.005	0.124	0.0243	54	44
Phosphorus (total, by ICPMS/ICPOES)	mg/L	0.142	0.112	0.197	0.032	6	6
Phosphorus (total, APHA 4500-P)	mg/L	0.1436	0.0833	0.288	0.039	54	54
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.0967	0.0404	0.154	0.0339	14	14
Potassium (total)	mg/L	18.6	16.4	19.9	1.3	6	6

Water Quality Results

Analyte	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results
Total Metals							
Aluminum (total)	mg/L	0.0483	0.0173	0.104	0.0322	6	6
Antimony (total)	mg/L	0.00018	0.0002	0.0003	0.00009	6	3
Arsenic (total)	mg/L					6	0
Barium (total)	mg/L	0.057	0.0456	0.074	0.0109	6	6
Beryllium (total)	mg/L					6	0
Bismuth (total)	mg/L	0.00006	<0.00010	0.00012	0.00003	6	1
Boron (total)	mg/L	0.179	0.158	0.235	0.028	6	6
Cadmium (total)	mg/L	0.000006	<0.000010	0.000011	0.000002	6	1
Calcium (total)	mg/L	72	65.1	78.8	5.8	6	6
Chromium (total)	mg/L	0.00127	<0.00050	0.00636	0.00249	6	1
Cobalt (total)	mg/L	0.00016	0.00013	0.0002	0.00003	6	6
Copper (total)	mg/L	0.00213	0.00113	0.00379	0.00111	6	6
Iron (total)	mg/L	0.034	0.013	0.053	0.013	6	6
Lead (total)	mg/L	0.00014	<0.00020	0.00032	0.00009	6	1
Lithium (total)	mg/L	0.00699	0.00658	0.00769	0.00039	6	6
Magnesium (total)	mg/L	14.3	13	15.8	1	6	6
Manganese (total)	mg/L	0.0453	0.0375	0.0567	0.0078	6	6
Mercury (total)	mg/L					6	0
Molybdenum (total)	mg/L	0.00133	0.00097	0.00196	0.00039	6	6
Nickel (total)	mg/L	0.00148	0.00044	0.00202	0.00054	6	6
Selenium (total)	mg/L					6	0
Silicon (total, as Si)	mg/L	10.8	9.8	12.8	1.1	6	6
Silver (total)	mg/L					6	0
Sodium (total)	mg/L	90.4	80.7	96.9	6.1	6	6
Strontium (total)	mg/L	0.594	0.54	0.644	0.036	6	6
Sulphur (total)	mg/L	17.8	16.6	19.4	1	6	6
Tellurium (total)	mg/L					6	0
Thallium (total)	mg/L	0.000018	<0.000020	0.000055	0.000018	6	1
Thorium (total)	mg/L					6	0
Tin (total)	mg/L	0.00017	<0.00020	0.00033	0.00011	6	2
Titanium (total)	mg/L					6	0
Tungsten (total)	mg/L					6	0
Uranium (total)	mg/L	0.00317	0.00211	0.0055	0.00118	6	6
Vanadium (total)	mg/L					6	0
Zinc (total)	mg/L	0.0287	0.0194	0.0324	0.0048	6	6
Zirconium (total)	mg/L	0.00007	<0.00010	0.00013	0.00004	6	2



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	03-Mar-21	03-Mar-21	04-Mar-21	05-Mar-21	06-Mar-21	07-Mar-21	08-Mar-21	09-Mar-21	09-Mar-21	10-Mar-21	11-Mar-21	12-Mar-21	13-Mar-21
Lab Sample ID for analyses except bacteriological		21C0600-01							21C1447-01				
Lab Sample ID for Bacteriological samples		21C0597-01							21C1446-01				
Sample Type	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		7.06	7.06	7.06	7.06	7.07	7.08	7.06		7.06	7.04	7.05	7.06
Temperature - 24 hour average	°C	11.4	11.3	11.5	11.8	11.7	11.6	11.6		11.6	11.5	11.5	11.6
pH - when sample collected			7.03						7.05				
Temperature - when sample collected			11.4						11.7				
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L		48						52				
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L		3.4						4				
UV transmittance at 254 nm - filtered	%		67						66				
Microbiological													
E. coli (MPN)	MPN/100 mL		<1						6				
Fecal coliforms (MPN)	MPN/100 mL		<1						6				
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L		1.41						0.338				
Nitrate (as N)	mg/L		2.88						1.33				
Nitrite (as N)	mg/L		0.132						0.043				
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L		0.0399						0.0111				
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L		0.279						0.288				
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
	14-Mar-21	15-Mar-21	16-Mar-21	16-Mar-21	17-Mar-21	18-Mar-21	19-Mar-21	20-Mar-21	21-Mar-21	22-Mar-21	23-Mar-21	24-Mar-21	24-Mar-21
Date Sampled				21C2368-01									21C3466-01
Lab Sample ID for analyses except bacteriological				21C2370-01									21C3465-01
Lab Sample ID for Bacteriological samples													
Sample Type	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		7.06	7.07	7.05		7.02	7.03	7.03	7.03	7.03	7.04	7.04	7.03
Temperature - 24 hour average	°C	11.8	11.8	11.8		11.8	12.1	12.4	12.4	12.3	12.3	12.5	
pH - when sample collected					7.05								7.04
Temperature - when sample collected					11.7								12.3
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												1.8
5-d Carbonaceous BOD	mg/L												1.7
Chemical Oxygen Demand	mg/L				34								35
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													7.7
Sulphate	mg/L												
Total suspended solids	mg/L				2								<2.0
UV transmittance at 254 nm - filtered	%				71.9								71.8
Microbiological													
E. coli (MPN)	MPN/100 mL				<1								<1
Fecal coliforms (MPN)	MPN/100 mL				<1								<1
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L				0.219								0.109
Nitrate (as N)	mg/L				1.05								0.721
Nitrite (as N)	mg/L				0.039								0.018
Total nitrogen	mg/L												2.27
Total kjeldahl nitrogen	mg/L												1.53
Total organic nitrogen	mg/L												1.42
Orthophosphate (dissolved, as P)	mg/L				0.0541								0.0107
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L				0.201								0.147
Phosphorus (dissolved, APHA 4500-P)	mg/L												0.0729
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	25-Mar-21	26-Mar-21	27-Mar-21	28-Mar-21	29-Mar-21	30-Mar-21	30-Mar-21	31-Mar-21	01-Apr-21	02-Apr-21	03-Apr-21	04-Apr-21	05-Apr-21
Lab Sample ID for analyses except bacteriological							21C4049-01						
Lab Sample ID for Bacteriological samples							21C4044-01						
Sample Type	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		7.03	7.02	7.02	7.03	7.07	7.03		7.03	7.04	7.03	7.03	7.03
Temperature - 24 hour average	°C	12.5	12.6	12.7	12.8	12.3	12.4		12.6	12.8	13	13.3	13.3
pH - when sample collected								7.05					
Temperature - when sample collected								12.5					
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L							31					
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L							2					
UV transmittance at 254 nm - filtered	%							61.1					
Microbiological													
E. coli (MPN)	MPN/100 mL							<1					
Fecal coliforms (MPN)	MPN/100 mL							<1					
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L							0.109					
Nitrate (as N)	mg/L							0.384					
Nitrite (as N)	mg/L							0.014					
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L							0.0223					
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L							0.157					
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	06-Apr-21	06-Apr-21	07-Apr-21	08-Apr-21	09-Apr-21	10-Apr-21	11-Apr-21	12-Apr-21	13-Apr-21	14-Apr-21	14-Apr-21	15-Apr-21	16-Apr-21
Lab Sample ID for analyses except bacteriological		21D0545-01									21D1599-01		
Lab Sample ID for Bacteriological samples		21D0533-01									21D1597-01		
Sample Type	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		7.05	7.04	7.04	7.04	7.02	7.03	7.05	7.05	7.04		7.02	7.01
Temperature - 24 hour average	°C	13.4	13.6	13.5	13.3	13.1	13	13	13.2	13.3		13.6	13.9
pH - when sample collected			7.07								7.06		
Temperature - when sample collected			13.4								13.2		
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L		48								28		
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L		<2.0								2		
UV transmittance at 254 nm - filtered	%		71								71.5		
Microbiological													
E. coli (MPN)	MPN/100 mL		<1								<1		
Fecal coliforms (MPN)	MPN/100 mL		<1								<1		
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L		0.098								0.212		
Nitrate (as N)	mg/L		0.058								0.18		
Nitrite (as N)	mg/L		<0.010								0.019		
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L		<0.0050								0.0054		
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L		0.16								0.137		
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	17-Apr-21	18-Apr-21	19-Apr-21	20-Apr-21	20-Apr-21	21-Apr-21	22-Apr-21	23-Apr-21	24-Apr-21	25-Apr-21	26-Apr-21	27-Apr-21	28-Apr-21	
Lab Sample ID for analyses except bacteriological					21D2207-01									
Lab Sample ID for Bacteriological samples					21D2205-01									
Sample Type	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit													
Field Results														
Reading Type: Online Instrument														
pH - 24 hour average		7.01	7.01	7.04	7.02		7	6.97	6.97	6.96	6.95	6.98	6.96	6.96
Temperature - 24 hour average	°C	14.2	14.4	14.5	14.6		14.7	14.8	14.8	15	15	14.9	15	15.2
pH - when sample collected						7.08								
Temperature - when sample collected						14.7								
Lab Results														
General														
Alkalinity (bicarbonate, as CaCO3)	mg/L					256								
Alkalinity (carbonate, as CaCO3)	mg/L					<1.0								
Alkalinity (hydroxide, as CaCO3)	mg/L					<1.0								
Alkalinity (phenolphthalein, as CaCO3)	mg/L					<1.0								
Alkalinity (total, as CaCO3)	mg/L					256								
Biochemical oxygen demand	mg/L					2								
5-d Carbonaceous BOD	mg/L					1.5								
Chemical Oxygen Demand	mg/L					27								
Chloride	mg/L					115								
Conductivity	µS/cm					935								
Fluoride	mg/L					0.17								
Hardness, Total (total as CaCO3)	mg/L					218								
pH						7.71								
Sulphate	mg/L					47.9								
Total suspended solids	mg/L					<2.0								
UV transmittance at 254 nm - filtered	%					68.5								
Microbiological														
E. coli (MPN)	MPN/100 mL					<1								
Fecal coliforms (MPN)	MPN/100 mL					<1								
Toxicity														
Mortality, 96 hour, Rainbow Trout	%													
Nutrients														
Ammonia (total, as N)	mg/L					0.1								
Nitrate (as N)	mg/L					<0.010								
Nitrite (as N)	mg/L					<0.010								
Total nitrogen	mg/L					1.47								
Total kjeldahl nitrogen	mg/L					1.47								
Total organic nitrogen	mg/L													
Orthophosphate (dissolved, as P)	mg/L					0.0068								
Phosphorus (total, by ICPMS/ICPOES)	mg/L					0.112								
Phosphorus (total, APHA 4500-P)	mg/L					0.12								
Phosphorus (dissolved, APHA 4500-P)	mg/L					0.0659								
Potassium (total)	mg/L					17.8								



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	28-Apr-21	29-Apr-21	30-Apr-21	01-May-21	02-May-21	03-May-21	04-May-21	05-May-21	05-May-21	06-May-21	07-May-21	08-May-21	09-May-21	
Lab Sample ID for analyses except bacteriological	21D3230-01								21E0636-01					
Lab Sample ID for Bacteriological samples	21D3229-01								21E0635-01					
Sample Type	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit													
Field Results														
Reading Type: Online Instrument														
pH - 24 hour average			6.97	6.94	6.94	6.93	6.93	6.91	6.92		6.94	6.93	6.92	6.93
Temperature - 24 hour average	°C		15.5	15.8	15.8	15.6	15.6	15.6	15.7		15.9	15.8	15.7	15.7
pH - when sample collected		7.04								6.99				
Temperature - when sample collected		15.5								15.9				
Lab Results														
General														
Alkalinity (bicarbonate, as CaCO3)	mg/L													
Alkalinity (carbonate, as CaCO3)	mg/L													
Alkalinity (hydroxide, as CaCO3)	mg/L													
Alkalinity (phenolphthalein, as CaCO3)	mg/L													
Alkalinity (total, as CaCO3)	mg/L													
Biochemical oxygen demand	mg/L													
5-d Carbonaceous BOD	mg/L													
Chemical Oxygen Demand	mg/L	35								43				
Chloride	mg/L													
Conductivity	µS/cm													
Fluoride	mg/L													
Hardness, Total (total as CaCO3)	mg/L													
pH														
Sulphate	mg/L													
Total suspended solids	mg/L	<2.0								<2.0				
UV transmittance at 254 nm - filtered	%	69.1								67.9				
Microbiological														
E. coli (MPN)	MPN/100 mL	<1								<1				
Fecal coliforms (MPN)	MPN/100 mL	<1								<1				
Toxicity														
Mortality, 96 hour, Rainbow Trout	%													
Nutrients														
Ammonia (total, as N)	mg/L	0.122								0.166				
Nitrate (as N)	mg/L	0.113								0.02				
Nitrite (as N)	mg/L	<0.010								<0.010				
Total nitrogen	mg/L													
Total kjeldahl nitrogen	mg/L													
Total organic nitrogen	mg/L													
Orthophosphate (dissolved, as P)	mg/L	0.0066								0.0144				
Phosphorus (total, by ICPMS/ICPOES)	mg/L													
Phosphorus (total, APHA 4500-P)	mg/L	0.121								0.145				
Phosphorus (dissolved, APHA 4500-P)	mg/L													
Potassium (total)	mg/L													



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Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	10-May-21	11-May-21	11-May-21	12-May-21	13-May-21	14-May-21	15-May-21	16-May-21	17-May-21	18-May-21	18-May-21	19-May-21	20-May-21
Lab Sample ID for analyses except bacteriological			21E1323-01								21E2192-01		
Lab Sample ID for Bacteriological samples			21E1322-01								21E2187-01		
Sample Type	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.91	6.88	6.85	6.85	6.88	6.9	6.92	6.93	6.9		6.9	6.89
Temperature - 24 hour average	°C	16	16.3	16.3	16.5	16.7	17	17.4	17.7	17.5		17.1	16.9
pH - when sample collected			6.94								6.9		
Temperature - when sample collected			16.4								17.6		
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L										2.5		
5-d Carbonaceous BOD	mg/L										2		
Chemical Oxygen Demand	mg/L			34							33		
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH											7.1		
Sulphate	mg/L												
Total suspended solids	mg/L			<2.0							3.1		
UV transmittance at 254 nm - filtered	%			66.2							66.7		
Microbiological													
E. coli (MPN)	MPN/100 mL			<1							<1		
Fecal coliforms (MPN)	MPN/100 mL			<1							<1		
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L			0.216							0.255		
Nitrate (as N)	mg/L			0.021							0.031		
Nitrite (as N)	mg/L			<0.010							<0.010		
Total nitrogen	mg/L										1.64		
Total kjeldahl nitrogen	mg/L										1.61		
Total organic nitrogen	mg/L										1.36		
Orthophosphate (dissolved, as P)	mg/L			0.0252							0.0135		
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L			0.167							0.134		
Phosphorus (dissolved, APHA 4500-P)	mg/L										0.0886		
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	21-May-21	22-May-21	23-May-21	24-May-21	25-May-21	26-May-21	26-May-21	27-May-21	28-May-21	29-May-21	30-May-21	31-May-21	01-Jun-21
Lab Sample ID for analyses except bacteriological							21E3065-01						
Lab Sample ID for Bacteriological samples							21E3064-01						
Sample Type	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.9	6.91	6.92	6.93	6.93	6.93		6.93	6.95	6.93	6.92	6.91
Temperature - 24 hour average	°C	16.8	17	17.3	17.6	17.8	18		17.9	17.9	17.8	18	18.4
pH - when sample collected								6.94					19
Temperature - when sample collected								18					
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L							29					
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L							<2.0					
UV transmittance at 254 nm - filtered	%							64.7					
Microbiological													
E. coli (MPN)	MPN/100 mL							<1					
Fecal coliforms (MPN)	MPN/100 mL							<1					
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L							0.265					
Nitrate (as N)	mg/L							0.132					
Nitrite (as N)	mg/L							0.138					
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L							0.0166					
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L							0.119					
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	02-Jun-21	02-Jun-21	03-Jun-21	04-Jun-21	05-Jun-21	06-Jun-21	07-Jun-21	08-Jun-21	09-Jun-21	09-Jun-21	10-Jun-21	11-Jun-21	12-Jun-21
Lab Sample ID for analyses except bacteriological		21F0508-01								21F1469-01			
Lab Sample ID for Bacteriological samples		21F0503-01								21F1462-01			
Sample Type	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.92	6.92	6.94	6.98	6.99	6.97	6.96	6.95		6.96	6.97	6.94
Temperature - 24 hour average	°C	19.5	19.9	20	19.6	18.9	18.5	18.3	18.3		18.5	18.4	18.6
pH - when sample collected			6.96							6.95			
Temperature - when sample collected			19.4							18.4			
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L		35							33			
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L		<2.0							<2.0			
UV transmittance at 254 nm - filtered	%		67.2							69.7			
Microbiological													
E. coli (MPN)	MPN/100 mL		<1							<1			
Fecal coliforms (MPN)	MPN/100 mL		<1							<1			
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L		0.301							0.185			
Nitrate (as N)	mg/L		0.278							0.982			
Nitrite (as N)	mg/L		0.071							0.133			
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L		<0.0050							0.005			
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L		0.117							0.111			
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	13-Jun-21	14-Jun-21	15-Jun-21	16-Jun-21	16-Jun-21	17-Jun-21	18-Jun-21	19-Jun-21	20-Jun-21	21-Jun-21	21-Jun-21	22-Jun-21	22-Jun-21	
Lab Sample ID for analyses except bacteriological					21F2434-01						21F2998-01		21F3140-01	
Lab Sample ID for Bacteriological samples					21F2424-01								21F3138-01	
Sample Type	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Normal
Analyte	Unit													
Field Results														
Reading Type: Online Instrument														
pH - 24 hour average		6.92	6.93	6.93	6.91		6.91	6.91	6.91	6.91	6.91	6.91	6.93	
Temperature - 24 hour average	°C	18.9	18.9	19	19.1		19.1	19.1	19.1	19.1	19.1	19.1	20.2	
pH - when sample collected						6.86								6.9
Temperature - when sample collected						19								20.2
Lab Results														
General														
Alkalinity (bicarbonate, as CaCO3)	mg/L													
Alkalinity (carbonate, as CaCO3)	mg/L													
Alkalinity (hydroxide, as CaCO3)	mg/L													
Alkalinity (phenolphthalein, as CaCO3)	mg/L													
Alkalinity (total, as CaCO3)	mg/L													
Biochemical oxygen demand	mg/L					2.4								
5-d Carbonaceous BOD	mg/L													
Chemical Oxygen Demand	mg/L					20								30
Chloride	mg/L													
Conductivity	µS/cm													
Fluoride	mg/L													
Hardness, Total (total as CaCO3)	mg/L													
pH						7.97								
Sulphate	mg/L													
Total suspended solids	mg/L					<2.0								<2.0
UV transmittance at 254 nm - filtered	%					67.8								72.6
Microbiological														
E. coli (MPN)	MPN/100 mL					<1								<1
Fecal coliforms (MPN)	MPN/100 mL					<1								<1
Toxicity														
Mortality, 96 hour, Rainbow Trout	%											0		
Nutrients														
Ammonia (total, as N)	mg/L					0.156								0.373
Nitrate (as N)	mg/L					1.78								0.388
Nitrite (as N)	mg/L					0.13								0.111
Total nitrogen	mg/L					3.3								
Total kjeldahl nitrogen	mg/L					1.38								
Total organic nitrogen	mg/L					1.23								
Orthophosphate (dissolved, as P)	mg/L					0.0585								0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L													
Phosphorus (total, APHA 4500-P)	mg/L					0.124								0.151
Phosphorus (dissolved, APHA 4500-P)	mg/L					0.094								
Potassium (total)	mg/L													



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	23-Jun-21	24-Jun-21	25-Jun-21	26-Jun-21	27-Jun-21	28-Jun-21	28-Jun-21	29-Jun-21	30-Jun-21	01-Jul-21	02-Jul-21	03-Jul-21	04-Jul-21	
Lab Sample ID for analyses except bacteriological							21F3816-01			2021Q30-01	2021Q30-02	2021Q30-03	2021Q30-04	
Lab Sample ID for Bacteriological samples							21F3804-01							
Sample Type	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit													
Field Results														
Reading Type: Online Instrument														
pH - 24 hour average		6.84	6.79	6.79	6.78	6.77	6.77		6.77	6.76	6.75	6.84	6.85	6.85
Temperature - 24 hour average	°C	21.1	21.3	21.6	22	22.4	22.8		23.2	23.5	23.6	23.4	23.4	23.2
pH - when sample collected								6.86						
Temperature - when sample collected								23						
Lab Results														
General														
Alkalinity (bicarbonate, as CaCO3)	mg/L													
Alkalinity (carbonate, as CaCO3)	mg/L													
Alkalinity (hydroxide, as CaCO3)	mg/L													
Alkalinity (phenolphthalein, as CaCO3)	mg/L													
Alkalinity (total, as CaCO3)	mg/L													
Biochemical oxygen demand	mg/L													
5-d Carbonaceous BOD	mg/L													
Chemical Oxygen Demand	mg/L							29						
Chloride	mg/L													
Conductivity	µS/cm													
Fluoride	mg/L													
Hardness, Total (total as CaCO3)	mg/L													
pH														
Sulphate	mg/L													
Total suspended solids	mg/L							<2.0						
UV transmittance at 254 nm - filtered	%							73.4						
Microbiological														
E. coli (MPN)	MPN/100 mL							<1						
Fecal coliforms (MPN)	MPN/100 mL							<1						
Toxicity														
Mortality, 96 hour, Rainbow Trout	%													
Nutrients														
Ammonia (total, as N)	mg/L							0.147						
Nitrate (as N)	mg/L							3.36						
Nitrite (as N)	mg/L							0.04						
Total nitrogen	mg/L													
Total kjeldahl nitrogen	mg/L													
Total organic nitrogen	mg/L													
Orthophosphate (dissolved, as P)	mg/L							0.124						
Phosphorus (total, by ICPMS/ICPOES)	mg/L													
Phosphorus (total, APHA 4500-P)	mg/L							0.155						
Phosphorus (dissolved, APHA 4500-P)	mg/L													
Potassium (total)	mg/L													



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	05-Jul-21	06-Jul-21	06-Jul-21	07-Jul-21	08-Jul-21	09-Jul-21	10-Jul-21	11-Jul-21	12-Jul-21	12-Jul-21	13-Jul-21	14-Jul-21	
Lab Sample ID for analyses except bacteriological	2021Q30-05	2021Q30-06	21G0676-01	2021Q30-07	2021Q30-08	2021Q30-09	2021Q30-10	2021Q30-11	21G1386-01	2021Q30-12	2021Q30-13	2021Q30-14	
Lab Sample ID for Bacteriological samples			21G0675-01						21G1380-01				
Sample Type	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.87	6.86		6.85	6.85	6.86	6.87	6.86	6.86	6.87	6.88	6.86
Temperature - 24 hour average	°C	23.1	23.2		23.1	22.9	22.9	23.2	23.3	23.4	23.4	23.5	23.6
pH - when sample collected				6.86									
Temperature - when sample collected			23.2										
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L			42					15				
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L			<2.0					<2.0				
UV transmittance at 254 nm - filtered	%			70.2					68.8				
Microbiological													
E. coli (MPN)	MPN/100 mL			<1					<1				
Fecal coliforms (MPN)	MPN/100 mL			<1					1				
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L			0.278					0.232				
Nitrate (as N)	mg/L			2.88					3.51				
Nitrite (as N)	mg/L			0.062					0.052				
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L			<0.0050					0.0323				
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L			0.0867					0.106				
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	15-Jul-21	16-Jul-21	17-Jul-21	18-Jul-21	19-Jul-21	20-Jul-21	21-Jul-21	21-Jul-21	21-Jul-21	21-Jul-21	22-Jul-21	23-Jul-21	
Lab Sample ID for analyses except bacteriological	2021Q30-15	2021Q30-16	2021Q30-17	2021Q30-18	2021Q30-19	2021Q30-20	2021Q30-21	21G2724-01	21G2724-02	21G2733-01	2021Q30-22	2021Q30-23	
Lab Sample ID for Bacteriological samples								21G2722-01	21G2731-01	21G2722-02			
Sample Type	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Duplicate	Duplicate	Field Only	Field Only
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.89	6.89	6.89	6.88	6.86	6.89	6.89				6.86	6.86
Temperature - 24 hour average	°C	23.5	23.5	23.3	23.4	23.4	23.2	22.9				22.7	22.7
pH - when sample collected									6.9	6.9	6.9		
Temperature - when sample collected									22.8	22.8	22.8		
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L								248	249	246		
Alkalinity (carbonate, as CaCO3)	mg/L								<1.0	<1.0	<1.0		
Alkalinity (hydroxide, as CaCO3)	mg/L								<1.0	<1.0	<1.0		
Alkalinity (phenolphthalein, as CaCO3)	mg/L								<1.0	<1.0	<1.0		
Alkalinity (total, as CaCO3)	mg/L								248	249	246		
Biochemical oxygen demand	mg/L								<1.0	<1.0	<1.0		
5-d Carbonaceous BOD	mg/L								<1.0	<1.0	<5.3		
Chemical Oxygen Demand	mg/L								21	21	22		
Chloride	mg/L								122	122	118		
Conductivity	µS/cm								918	919	925		
Fluoride	mg/L								0.14	0.14	0.16		
Hardness, Total (total as CaCO3)	mg/L								245	257	253		
pH									7.89	7.87	7.97		
Sulphate	mg/L								49.4	46.6	46.7		
Total suspended solids	mg/L								<2.0	<2.0	<4.0		
UV transmittance at 254 nm - filtered	%								70.9	71	71.1		
Microbiological													
E. coli (MPN)	MPN/100 mL								1	<1	<1		
Fecal coliforms (MPN)	MPN/100 mL								1	<1	<1		
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L								0.149	0.167	0.167		
Nitrate (as N)	mg/L								2.27	2.28	2.28		
Nitrite (as N)	mg/L								0.025	0.025	0.026		
Total nitrogen	mg/L								3.36	3.42	3.39		
Total kjeldahl nitrogen	mg/L								1.07	1.12	1.08		
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L								0.0406	0.0436	0.05		
Phosphorus (total, by ICPMS/ICPOES)	mg/L								0.135	0.162	0.197		
Phosphorus (total, APHA 4500-P)	mg/L								0.149	0.152	0.152		
Phosphorus (dissolved, APHA 4500-P)	mg/L								0.14	0.138	0.135		
Potassium (total)	mg/L								19.3	19.9	19.4		



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	24-Jul-21	25-Jul-21	26-Jul-21	27-Jul-21	27-Jul-21	28-Jul-21	29-Jul-21	30-Jul-21	31-Jul-21	01-Aug-21	02-Aug-21	03-Aug-21
Lab Sample ID for analyses except bacteriological	2021Q30-24	2021Q30-25	2021Q30-26	2021Q30-27	21G3453-01	2021Q30-28	2021Q30-29	2021Q30-30	2021Q30-31	2021Q30-32	2021Q30-33	2021Q30-34
Lab Sample ID for Bacteriological samples					21G3452-01							
Sample Type	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only
Analyte	Unit											
Field Results												
Reading Type: Online Instrument												
pH - 24 hour average		6.85	6.84	6.86	6.88		6.87	6.85	6.85	6.85	6.85	6.86
Temperature - 24 hour average	°C	22.9	23.1	23.1	23.2		23.3	23.3	23.4	23.5	23.4	23.5
pH - when sample collected						6.9						
Temperature - when sample collected						23.3						
Lab Results												
General												
Alkalinity (bicarbonate, as CaCO3)	mg/L											
Alkalinity (carbonate, as CaCO3)	mg/L											
Alkalinity (hydroxide, as CaCO3)	mg/L											
Alkalinity (phenolphthalein, as CaCO3)	mg/L											
Alkalinity (total, as CaCO3)	mg/L											
Biochemical oxygen demand	mg/L											
5-d Carbonaceous BOD	mg/L											
Chemical Oxygen Demand	mg/L					13						
Chloride	mg/L											
Conductivity	µS/cm											
Fluoride	mg/L											
Hardness, Total (total as CaCO3)	mg/L											
pH												
Sulphate	mg/L											
Total suspended solids	mg/L					<2.0						
UV transmittance at 254 nm - filtered	%					73.4						
Microbiological												
E. coli (MPN)	MPN/100 mL					<1						
Fecal coliforms (MPN)	MPN/100 mL					<1						
Toxicity												
Mortality, 96 hour, Rainbow Trout	%											
Nutrients												
Ammonia (total, as N)	mg/L					0.15						
Nitrate (as N)	mg/L					1.53						
Nitrite (as N)	mg/L					0.033						
Total nitrogen	mg/L											
Total kjeldahl nitrogen	mg/L											
Total organic nitrogen	mg/L											
Orthophosphate (dissolved, as P)	mg/L					0.0416						
Phosphorus (total, by ICPMS/ICPOES)	mg/L											
Phosphorus (total, APHA 4500-P)	mg/L					0.105						
Phosphorus (dissolved, APHA 4500-P)	mg/L											
Potassium (total)	mg/L											



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	04-Aug-21	04-Aug-21	05-Aug-21	06-Aug-21	07-Aug-21	08-Aug-21	09-Aug-21	10-Aug-21	10-Aug-21	11-Aug-21	12-Aug-21	13-Aug-21
Lab Sample ID for analyses except bacteriological	2021Q30-35	21H0506-01	2021Q30-36	2021Q30-37	2021Q30-38	2021Q30-39	2021Q30-40	2021Q30-41	21H1192-01	2021Q30-42	2021Q30-43	2021Q30-44
Lab Sample ID for Bacteriological samples		21H0504-01							21H1182-01			
Sample Type	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only
Analyte	Unit											
Field Results												
Reading Type: Online Instrument												
pH - 24 hour average		6.85	6.89	6.84	6.97	6.91	6.89	6.89		6.86	6.88	6.89
Temperature - 24 hour average	°C	23.7	23.7	23.6	23.4	22.9	22.7	22.9		23.3	23.3	23.2
pH - when sample collected			6.9						6.91			
Temperature - when sample collected			23.6						23			
Lab Results												
General												
Alkalinity (bicarbonate, as CaCO3)	mg/L											
Alkalinity (carbonate, as CaCO3)	mg/L											
Alkalinity (hydroxide, as CaCO3)	mg/L											
Alkalinity (phenolphthalein, as CaCO3)	mg/L											
Alkalinity (total, as CaCO3)	mg/L											
Biochemical oxygen demand	mg/L								1.3			
5-d Carbonaceous BOD	mg/L											
Chemical Oxygen Demand	mg/L		24						28			
Chloride	mg/L											
Conductivity	µS/cm											
Fluoride	mg/L											
Hardness, Total (total as CaCO3)	mg/L											
pH									7.79			
Sulphate	mg/L											
Total suspended solids	mg/L		<2.0						<2.0			
UV transmittance at 254 nm - filtered	%		72.8						63			
Microbiological												
E. coli (MPN)	MPN/100 mL		1						1			
Fecal coliforms (MPN)	MPN/100 mL		2						1			
Toxicity												
Mortality, 96 hour, Rainbow Trout	%											
Nutrients												
Ammonia (total, as N)	mg/L		0.156						0.141			
Nitrate (as N)	mg/L		2.53						1.52			
Nitrite (as N)	mg/L		0.021						0.052			
Total nitrogen	mg/L								2.73			
Total kjeldahl nitrogen	mg/L								1.16			
Total organic nitrogen	mg/L								1.01			
Orthophosphate (dissolved, as P)	mg/L		0.0729						0.0111			
Phosphorus (total, by ICPMS/ICPOES)	mg/L											
Phosphorus (total, APHA 4500-P)	mg/L		0.16						0.0889			
Phosphorus (dissolved, APHA 4500-P)	mg/L								0.0648			
Potassium (total)	mg/L											



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	14-Aug-21	15-Aug-21	16-Aug-21	17-Aug-21	18-Aug-21	18-Aug-21	19-Aug-21	20-Aug-21	21-Aug-21	22-Aug-21	23-Aug-21	24-Aug-21	
Lab Sample ID for analyses except bacteriological	2021Q30-45	2021Q30-46	2021Q30-47	2021Q30-48	2021Q30-49	21H2289-01	2021Q30-50	2021Q30-51	2021Q30-52	2021Q30-53	2021Q30-54	2021Q30-55	
Lab Sample ID for Bacteriological samples						21H2287-01							
Sample Type	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.87	6.88	6.89	6.9	6.85		6.83	6.85	6.84	6.85	6.86	6.86
Temperature - 24 hour average	°C	23.2	23.2	23.1	22.4	22.3		22.5	22.5	22.4	22.2	21.8	21.6
pH - when sample collected							6.86						
Temperature - when sample collected							22.4						
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L						15						
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L						<2.0						
UV transmittance at 254 nm - filtered	%						72.9						
Microbiological													
E. coli (MPN)	MPN/100 mL						1						
Fecal coliforms (MPN)	MPN/100 mL						1						
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L						0.217						
Nitrate (as N)	mg/L						3.07						
Nitrite (as N)	mg/L						0.039						
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L						0.0442						
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L						0.101						
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	25-Aug-21	25-Aug-21	26-Aug-21	27-Aug-21	27-Aug-21	28-Aug-21	29-Aug-21	30-Aug-21	31-Aug-21	31-Aug-21	01-Sep-21	02-Sep-21
Lab Sample ID for analyses except bacteriological	2021Q3O-56	21H3425-01	2021Q3O-57	2021Q3O-58	21H3412-01	2021Q3O-59	2021Q3O-60	2021Q3O-61	2021Q3O-62	21I0156-01	2021Q3O-63	2021Q3O-64
Lab Sample ID for Bacteriological samples										21I0155-01		
Sample Type	Field Only	Normal	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only
Analyte	Unit											
Field Results												
Reading Type: Online Instrument												
pH - 24 hour average		6.86	6.84	6.84		6.83	6.83	6.84	6.87		6.85	6.85
Temperature - 24 hour average	°C	21.7	21.8	21.9		21.9	21.9	21.7	21.4		21.3	21.1
pH - when sample collected			6.86							6.85		
Temperature - when sample collected			21.7							21.6		
Lab Results												
General												
Alkalinity (bicarbonate, as CaCO3)	mg/L											
Alkalinity (carbonate, as CaCO3)	mg/L											
Alkalinity (hydroxide, as CaCO3)	mg/L											
Alkalinity (phenolphthalein, as CaCO3)	mg/L											
Alkalinity (total, as CaCO3)	mg/L											
Biochemical oxygen demand	mg/L											
5-d Carbonaceous BOD	mg/L											
Chemical Oxygen Demand	mg/L		22							20		
Chloride	mg/L											
Conductivity	µS/cm											
Fluoride	mg/L											
Hardness, Total (total as CaCO3)	mg/L											
pH												
Sulphate	mg/L											
Total suspended solids	mg/L		<2.0							<2.0		
UV transmittance at 254 nm - filtered	%		71.4							73.3		
Microbiological												
E. coli (MPN)	MPN/100 mL				<1					1		
Fecal coliforms (MPN)	MPN/100 mL				<1					1		
Toxicity												
Mortality, 96 hour, Rainbow Trout	%											
Nutrients												
Ammonia (total, as N)	mg/L		0.25							0.197		
Nitrate (as N)	mg/L		2.37							1.77		
Nitrite (as N)	mg/L		0.033							0.027		
Total nitrogen	mg/L											
Total kjeldahl nitrogen	mg/L											
Total organic nitrogen	mg/L											
Orthophosphate (dissolved, as P)	mg/L		0.0254							0.0747		
Phosphorus (total, by ICPMS/ICPOES)	mg/L											
Phosphorus (total, APHA 4500-P)	mg/L		0.13							0.174		
Phosphorus (dissolved, APHA 4500-P)	mg/L											
Potassium (total)	mg/L											



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	03-Sep-21	04-Sep-21	05-Sep-21	06-Sep-21	07-Sep-21	07-Sep-21	08-Sep-21	09-Sep-21	10-Sep-21	11-Sep-21	12-Sep-21	13-Sep-21	
Lab Sample ID for analyses except bacteriological	2021Q30-65	2021Q30-66	2021Q30-67	2021Q30-68	2021Q30-69	2111030-01	2021Q30-70	2021Q30-71	2021Q30-72	2021Q30-73	2021Q30-74	2021Q30-75	
Lab Sample ID for Bacteriological samples						2111002-01							
Sample Type	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.85	6.83	6.85	6.86	6.87		6.84	6.87	6.88	6.88	6.87	6.9
Temperature - 24 hour average	°C	21.2	21.4	21.5	21.5	21.5		21.6	21.7	21.7	21.7	21.8	21.7
pH - when sample collected							6.91						
Temperature - when sample collected							21.7						
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L						24						
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L						<2.0						
UV transmittance at 254 nm - filtered	%						71.9						
Microbiological													
E. coli (MPN)	MPN/100 mL						<1						
Fecal coliforms (MPN)	MPN/100 mL						<1						
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L						0.163						
Nitrate (as N)	mg/L						2.02						
Nitrite (as N)	mg/L						0.05						
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L						0.0766						
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L						0.175						
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	13-Sep-21	14-Sep-21	15-Sep-21	16-Sep-21	17-Sep-21	18-Sep-21	19-Sep-21	20-Sep-21	21-Sep-21	21-Sep-21	22-Sep-21	23-Sep-21	
Lab Sample ID for analyses except bacteriological	2111686-01	2021Q3O-76	2021Q3O-77	2021Q3O-78	2021Q3O-79	2021Q3O-80	2021Q3O-81	2021Q3O-82	2021Q3O-83	21I2976-01	2021Q3O-84	2021Q3O-85	
Lab Sample ID for Bacteriological samples	2111684-01									21I2954-01			
Sample Type	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average			6.9	6.94	6.95	6.92	6.88	6.88	6.87	6.9		6.89	6.89
Temperature - 24 hour average	°C		21.4	21.1	20.7	20.2	20.2	20.2	20.3	20.2		20.2	20.1
pH - when sample collected		6.89									6.91		
Temperature - when sample collected		21.7									20.2		
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L										<7.4		
Chemical Oxygen Demand	mg/L	24									38		
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH											7.65		
Sulphate	mg/L												
Total suspended solids	mg/L	<2.0									<2.0		
UV transmittance at 254 nm - filtered	%	71.6									68.7		
Microbiological													
E. coli (MPN)	MPN/100 mL	<1									<1		
Fecal coliforms (MPN)	MPN/100 mL	<1									<1		
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L	0.209									0.329		
Nitrate (as N)	mg/L	2.26									1.76		
Nitrite (as N)	mg/L	0.062									0.162		
Total nitrogen	mg/L										3.38		
Total kjeldahl nitrogen	mg/L										1.46		
Total organic nitrogen	mg/L										1.13		
Orthophosphate (dissolved, as P)	mg/L	0.0253									0.0136		
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L	0.124									0.124		
Phosphorus (dissolved, APHA 4500-P)	mg/L										0.0882		
Potassium (total)	mg/L												



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Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	24-Sep-21	25-Sep-21	26-Sep-21	27-Sep-21	28-Sep-21	28-Sep-21	29-Sep-21	30-Sep-21	01-Oct-21	02-Oct-21	03-Oct-21	04-Oct-21	
Lab Sample ID for analyses except bacteriological	2021Q3O-86	2021Q3O-87	2021Q3O-88	2021Q3O-89	2021Q3O-90	21I3936-01	2021Q3O-91	2021Q3O-92	2021Q4O-01	2021Q4O-02	2021Q4O-03	2021Q4O-04	
Lab Sample ID for Bacteriological samples						21I3932-01							
Sample Type	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.88	6.85	6.85	6.85	6.86		6.89	6.92	6.9	6.91	6.91	6.93
Temperature - 24 hour average	°C	20.1	20.2	20.3	20.3	19.9		19.5	19.2	19.1	18.9	19	19.1
pH - when sample collected							6.84						
Temperature - when sample collected							19.9						
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L						20						
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L						<2.0						
UV transmittance at 254 nm - filtered	%						68						
Microbiological													
E. coli (MPN)	MPN/100 mL						<1						
Fecal coliforms (MPN)	MPN/100 mL						<1						
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L						0.461						
Nitrate (as N)	mg/L						1.85						
Nitrite (as N)	mg/L						0.246						
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L						0.0339						
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L						0.148						
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



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Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	04-Oct-21	05-Oct-21	06-Oct-21	07-Oct-21	08-Oct-21	09-Oct-21	10-Oct-21	11-Oct-21	12-Oct-21	13-Oct-21	13-Oct-21	14-Oct-21
Lab Sample ID for analyses except bacteriological	21J0506-01	2021Q40-05	2021Q40-06	2021Q40-07	2021Q40-08	2021Q40-09	2021Q40-10	2021Q40-11	2021Q40-12	2021Q40-13	21J1855-01	2021Q40-14
Lab Sample ID for Bacteriological samples	21J0504-01										21J1849-01	
Sample Type	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only
Analyte	Unit											
Field Results												
Reading Type: Online Instrument												
pH - 24 hour average			6.93	6.93	6.93	6.89	6.91	6.93	6.93	6.93	6.91	6.92
Temperature - 24 hour average	°C		19.2	19	18.7	18.4	18	17.8	17.6	17.3	17.4	17.3
pH - when sample collected		6.91									6.91	
Temperature - when sample collected		19.1									17.4	
Lab Results												
General												
Alkalinity (bicarbonate, as CaCO3)	mg/L											
Alkalinity (carbonate, as CaCO3)	mg/L											
Alkalinity (hydroxide, as CaCO3)	mg/L											
Alkalinity (phenolphthalein, as CaCO3)	mg/L											
Alkalinity (total, as CaCO3)	mg/L											
Biochemical oxygen demand	mg/L											
5-d Carbonaceous BOD	mg/L											
Chemical Oxygen Demand	mg/L	51									29	
Chloride	mg/L											
Conductivity	µS/cm											
Fluoride	mg/L											
Hardness, Total (total as CaCO3)	mg/L											
pH												
Sulphate	mg/L											
Total suspended solids	mg/L	<2.0									<2.0	
UV transmittance at 254 nm - filtered	%	66.3									68.1	
Microbiological												
E. coli (MPN)	MPN/100 mL	1									<1	
Fecal coliforms (MPN)	MPN/100 mL	1									<1	
Toxicity												
Mortality, 96 hour, Rainbow Trout	%											
Nutrients												
Ammonia (total, as N)	mg/L	0.309									0.286	
Nitrate (as N)	mg/L	2.38									1.79	
Nitrite (as N)	mg/L	0.257									0.261	
Total nitrogen	mg/L											
Total kjeldahl nitrogen	mg/L											
Total organic nitrogen	mg/L											
Orthophosphate (dissolved, as P)	mg/L	<0.0050									0.0148	
Phosphorus (total, by ICPMS/ICPOES)	mg/L											
Phosphorus (total, APHA 4500-P)	mg/L	0.11									0.0921	
Phosphorus (dissolved, APHA 4500-P)	mg/L											
Potassium (total)	mg/L											



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Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	15-Oct-21	16-Oct-21	17-Oct-21	18-Oct-21	19-Oct-21	19-Oct-21	20-Oct-21	21-Oct-21	22-Oct-21	23-Oct-21	24-Oct-21	25-Oct-21	
Lab Sample ID for analyses except bacteriological	2021Q40-15	2021Q40-16	2021Q40-17	2021Q40-18	2021Q40-19	21J2669-01	2021Q40-20	2021Q40-21	2021Q40-22	2021Q40-23	2021Q40-24	2021Q40-25	
Lab Sample ID for Bacteriological samples						21J2667-01							
Sample Type	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.92	6.93	6.9	6.9	6.91		6.88	6.87	6.86	6.86	6.88	6.89
Temperature - 24 hour average	°C	17.3	17.4	17.7	17.7	17.5		17.4	17.3	17.3	17.3	17.2	17.1
pH - when sample collected							6.89						
Temperature - when sample collected							17.6						
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L						257						
Alkalinity (carbonate, as CaCO3)	mg/L						<1.0						
Alkalinity (hydroxide, as CaCO3)	mg/L						<1.0						
Alkalinity (phenolphthalein, as CaCO3)	mg/L						<1.0						
Alkalinity (total, as CaCO3)	mg/L						257						
Biochemical oxygen demand	mg/L						1.5						
5-d Carbonaceous BOD	mg/L						2.2						
Chemical Oxygen Demand	mg/L						20						
Chloride	mg/L						128						
Conductivity	µS/cm						954						
Fluoride	mg/L						0.19						
Hardness, Total (total as CaCO3)	mg/L						229						
pH							7.74						
Sulphate	mg/L						50.7						
Total suspended solids	mg/L						<2.0						
UV transmittance at 254 nm - filtered	%						66.8						
Microbiological													
E. coli (MPN)	MPN/100 mL						<1						
Fecal coliforms (MPN)	MPN/100 mL						1						
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L						0.498						
Nitrate (as N)	mg/L						1.55						
Nitrite (as N)	mg/L						0.222						
Total nitrogen	mg/L						3.74						
Total kjeldahl nitrogen	mg/L						1.97						
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L						0.0263						
Phosphorus (total, by ICPMS/ICPOES)	mg/L						0.13						
Phosphorus (total, APHA 4500-P)	mg/L						0.123						
Phosphorus (dissolved, APHA 4500-P)	mg/L						0.0912						
Potassium (total)	mg/L						18.7						



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	25-Oct-21	26-Oct-21	27-Oct-21	28-Oct-21	29-Oct-21	30-Oct-21	31-Oct-21	01-Nov-21	01-Nov-21	02-Nov-21	03-Nov-21	04-Nov-21	
Lab Sample ID for analyses except bacteriological	21J3495-01	2021Q40-26	2021Q40-27	2021Q40-28	2021Q40-29	2021Q40-30	2021Q40-31	2021Q40-32	21K0186-01	2021Q40-33	2021Q40-34	2021Q40-35	
Lab Sample ID for Bacteriological samples	21J3492-01								21K0183-01				
Sample Type	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average			6.89	6.86	6.87	6.88	6.87	6.89	6.89		6.41	6.88	6.7
Temperature - 24 hour average	°C		16.9	16.8	16.8	16.5	15.9	15.4	15.3		14.3	15.7	15.7
pH - when sample collected		6.89								6.89			
Temperature - when sample collected		17.1								15.2			
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L	26								31			
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L	<2.0								<2.0			
UV transmittance at 254 nm - filtered	%	66								66.1			
Microbiological													
E. coli (MPN)	MPN/100 mL	<1								<1			
Fecal coliforms (MPN)	MPN/100 mL	<1								<1			
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L	1.28								0.983			
Nitrate (as N)	mg/L	1.25								1.67			
Nitrite (as N)	mg/L	0.202								0.092			
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L	0.0458								<0.0050			
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L	0.0833								0.136			
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



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Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	05-Nov-21	06-Nov-21	07-Nov-21	08-Nov-21	08-Nov-21	09-Nov-21	10-Nov-21	11-Nov-21	12-Nov-21	13-Nov-21	14-Nov-21	15-Nov-21	
Lab Sample ID for analyses except bacteriological	2021Q40-36	2021Q40-37	2021Q40-38	2021Q40-39	21K1272-01	2021Q40-40	2021Q40-41	2021Q40-42	2021Q40-43	2021Q40-44	2021Q40-45	2021Q40-46	
Lab Sample ID for Bacteriological samples					21K1269-01								
Sample Type	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.86	6.87	6.88	6.87		6.9	6.9	6.9	6.91	6.88	6.88	6.87
Temperature - 24 hour average	°C	16.1	15.9	15.6	15.3		15.2	15.1	15	15	15	15	15.3
pH - when sample collected						6.86							
Temperature - when sample collected						15.6							
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L					31							
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L					<2.0							
UV transmittance at 254 nm - filtered	%					67.4							
Microbiological													
E. coli (MPN)	MPN/100 mL					2							
Fecal coliforms (MPN)	MPN/100 mL					28							
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L					0.98							
Nitrate (as N)	mg/L					1.25							
Nitrite (as N)	mg/L					0.084							
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L					0.0325							
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L					0.124							
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	15-Nov-21	16-Nov-21	17-Nov-21	18-Nov-21	19-Nov-21	20-Nov-21	21-Nov-21	22-Nov-21	22-Nov-21	23-Nov-21	24-Nov-21	25-Nov-21	
Lab Sample ID for analyses except bacteriological	21K2053-01	2021Q40-47	2021Q40-48	2021Q40-49	2021Q40-50	2021Q40-51	2021Q40-52	2021Q40-53	21K2909-01	2021Q40-54	2021Q40-55	2021Q40-56	
Lab Sample ID for Bacteriological samples	21K2051-01								21K2907-01				
Sample Type	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average			6.84	6.86	6.86	6.87	6.86	6.89	6.9		6.87	6.88	6.89
Temperature - 24 hour average	°C		14.9	14.6	14.5	14.2	14	13.9	13.9		14	13.7	13.6
pH - when sample collected		6.9								6.89			
Temperature - when sample collected		15.3								13.9			
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L								5.6				
Chemical Oxygen Demand	mg/L	30							28				
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH									7.66				
Sulphate	mg/L												
Total suspended solids	mg/L	<2.0							<2.0				
UV transmittance at 254 nm - filtered	%	66.1							66.1				
Microbiological													
E. coli (MPN)	MPN/100 mL	<1							1				
Fecal coliforms (MPN)	MPN/100 mL	<1							1				
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L	0.934							1				
Nitrate (as N)	mg/L	1.59							1.75				
Nitrite (as N)	mg/L	0.1							0.106				
Total nitrogen	mg/L								4.3				
Total kjeldahl nitrogen	mg/L								2.45				
Total organic nitrogen	mg/L								1.44				
Orthophosphate (dissolved, as P)	mg/L	<0.0050							0.0056				
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L	0.144							0.145				
Phosphorus (dissolved, APHA 4500-P)	mg/L								0.108				
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	26-Nov-21	27-Nov-21	28-Nov-21	29-Nov-21	29-Nov-21	30-Nov-21	01-Dec-21	02-Dec-21	03-Dec-21	04-Dec-21	05-Dec-21	06-Dec-21	
Lab Sample ID for analyses except bacteriological	2021Q40-57	2021Q40-58	2021Q40-59	2021Q40-60	21K3797-01	2021Q40-61	2021Q40-62	2021Q40-63	2021Q40-64	2021Q40-65	2021Q40-66	2021Q40-67	
Lab Sample ID for Bacteriological samples					21K3794-01								
Sample Type	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.88	6.88	6.91	6.92		6.9	6.89	6.93	6.87	6.88	6.87	6.9
Temperature - 24 hour average	°C	13.7	13.8	14.1	14.3		14.4	14.6	14.6	14.1	13.8	13.3	13.1
pH - when sample collected						6.88							
Temperature - when sample collected						14.4							
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L					29							
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L					<2.0							
UV transmittance at 254 nm - filtered	%					67.7							
Microbiological													
E. coli (MPN)	MPN/100 mL					<1							
Fecal coliforms (MPN)	MPN/100 mL					<1							
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L					1.92							
Nitrate (as N)	mg/L					1.7							
Nitrite (as N)	mg/L					0.093							
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L					0.013							
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L					0.152							
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	07-Dec-21	07-Dec-21	08-Dec-21	09-Dec-21	10-Dec-21	11-Dec-21	12-Dec-21	13-Dec-21	13-Dec-21	14-Dec-21	15-Dec-21	16-Dec-21	
Lab Sample ID for analyses except bacteriological	21L1226-01	2021Q40-68	2021Q40-69	2021Q40-70	2021Q40-71	2021Q40-72	2021Q40-73	2021Q40-74	21L2031-01	2021Q40-75	2021Q40-76	2021Q40-77	
Lab Sample ID for Bacteriological samples	21L1225-01								21L2030-01				
Sample Type	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average			6.89	6.87	6.86	6.88	6.88	6.86	6.9		6.84	6.83	6.84
Temperature - 24 hour average	°C		13.1	12.8	12.8	12.5	12.6	12.6	12.8		12.9	12.7	12.5
pH - when sample collected		6.86								6.82			
Temperature - when sample collected		13.2								12.8			
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L	4.6											
Chemical Oxygen Demand	mg/L	50								30			
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH		7.66											
Sulphate	mg/L												
Total suspended solids	mg/L	<2.0								2.6			
UV transmittance at 254 nm - filtered	%	65.3								64.2			
Microbiological													
E. coli (MPN)	MPN/100 mL	<1								<1			
Fecal coliforms (MPN)	MPN/100 mL	<1								1			
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L	1.21								1.35			
Nitrate (as N)	mg/L	1.44								1.46			
Nitrite (as N)	mg/L	0.059								0.074			
Total nitrogen	mg/L	4.18											
Total kjeldahl nitrogen	mg/L	2.68											
Total organic nitrogen	mg/L	1.47											
Orthophosphate (dissolved, as P)	mg/L	0.0288								0.0183			
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L	0.209								0.192			
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.154											
Potassium (total)	mg/L												



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	
Date Sampled	17-Dec-21	18-Dec-21	19-Dec-21	20-Dec-21	20-Dec-21	21-Dec-21	22-Dec-21	23-Dec-21	24-Dec-21	25-Dec-21	26-Dec-21	27-Dec-21	
Lab Sample ID for analyses except bacteriological	2021Q40-78	2021Q40-79	2021Q40-80	21L3031-01	2021Q40-81	2021Q40-82	2021Q40-83	2021Q40-84	2021Q40-85	2021Q40-86	2021Q40-87	2021Q40-88	
Lab Sample ID for Bacteriological samples				21L3030-01									
Sample Type	Field Only	Field Only	Field Only	Normal	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	Field Only	
Analyte	Unit												
Field Results													
Reading Type: Online Instrument													
pH - 24 hour average		6.83	6.84	6.84		6.84	6.9	6.92	6.91	6.91	6.94	6.95	6.94
Temperature - 24 hour average	°C	11.9	11.6	11.5		11.4	11.1	11	11.4	11.4	10.7	9.5	8.7
pH - when sample collected					6.79								
Temperature - when sample collected					11.4								
Lab Results													
General													
Alkalinity (bicarbonate, as CaCO3)	mg/L												
Alkalinity (carbonate, as CaCO3)	mg/L												
Alkalinity (hydroxide, as CaCO3)	mg/L												
Alkalinity (phenolphthalein, as CaCO3)	mg/L												
Alkalinity (total, as CaCO3)	mg/L												
Biochemical oxygen demand	mg/L												
5-d Carbonaceous BOD	mg/L												
Chemical Oxygen Demand	mg/L				32								
Chloride	mg/L												
Conductivity	µS/cm												
Fluoride	mg/L												
Hardness, Total (total as CaCO3)	mg/L												
pH													
Sulphate	mg/L												
Total suspended solids	mg/L				<2.0								
UV transmittance at 254 nm - filtered	%				66.8								
Microbiological													
E. coli (MPN)	MPN/100 mL				<1								
Fecal coliforms (MPN)	MPN/100 mL				<1								
Toxicity													
Mortality, 96 hour, Rainbow Trout	%												
Nutrients													
Ammonia (total, as N)	mg/L				1.56								
Nitrate (as N)	mg/L				1.17								
Nitrite (as N)	mg/L				0.044								
Total nitrogen	mg/L												
Total kjeldahl nitrogen	mg/L												
Total organic nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L				0.0456								
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Phosphorus (total, APHA 4500-P)	mg/L				0.147								
Phosphorus (dissolved, APHA 4500-P)	mg/L												
Potassium (total)	mg/L												



Water Quality Results

Sampling Location	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled	28-Dec-21	28-Dec-21	29-Dec-21	30-Dec-21	31-Dec-21
Lab Sample ID for analyses except bacteriological	2021Q4O-89	21L3471-01	2021Q4O-90	2021Q4O-91	2021Q4O-92
Lab Sample ID for Bacteriological samples		21L3469-01			
Sample Type	Field Only	Normal	Field Only	Field Only	Field Only
Analyte	Unit				
Field Results					
Reading Type: Online Instrument					
pH - 24 hour average		6.94		6.95	6.94
Temperature - 24 hour average	°C	8.7		8.7	9.1
pH - when sample collected			6.94		
Temperature - when sample collected			8.7		
Lab Results					
General					
Alkalinity (bicarbonate, as CaCO ₃)	mg/L				
Alkalinity (carbonate, as CaCO ₃)	mg/L				
Alkalinity (hydroxide, as CaCO ₃)	mg/L				
Alkalinity (phenolphthalein, as CaCO ₃)	mg/L				
Alkalinity (total, as CaCO ₃)	mg/L				
Biochemical oxygen demand	mg/L				
5-d Carbonaceous BOD	mg/L				
Chemical Oxygen Demand	mg/L		30		
Chloride	mg/L				
Conductivity	µS/cm				
Fluoride	mg/L				
Hardness, Total (total as CaCO ₃)	mg/L				
pH					
Sulphate	mg/L				
Total suspended solids	mg/L		<2.0		
UV transmittance at 254 nm - filtered	%		66		
Microbiological					
E. coli (MPN)	MPN/100 mL		<1		
Fecal coliforms (MPN)	MPN/100 mL		1		
Toxicity					
Mortality, 96 hour, Rainbow Trout	%				
Nutrients					
Ammonia (total, as N)	mg/L		3.88		
Nitrate (as N)	mg/L		1.25		
Nitrite (as N)	mg/L		0.057		
Total nitrogen	mg/L				
Total kjeldahl nitrogen	mg/L				
Total organic nitrogen	mg/L				
Orthophosphate (dissolved, as P)	mg/L		<0.0050		
Phosphorus (total, by ICPMS/ICPOES)	mg/L				
Phosphorus (total, APHA 4500-P)	mg/L		0.143		
Phosphorus (dissolved, APHA 4500-P)	mg/L				
Potassium (total)	mg/L				



Water Quality Results

Analyte	Unit	Sampling Location					
		OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent	OK Falls AWWTP Treated Effluent
Date Sampled		20-Jan-21	20-Apr-21	21-Jul-21	21-Jul-21	21-Jul-21	19-Oct-21
Lab Sample ID		21A1869-01	21D2207-01	21G2724-01	21G2724-02	21G2733-01	21J2669-01
Sample Type		Normal	Normal	Normal	Duplicate	Duplicate	Normal
Total Metals							
Aluminum (total)	mg/L	0.104	0.0475	0.0288	0.0272	0.0651	0.0173
Antimony (total)	mg/L	0.0002	<0.00020	0.00026	<0.00020	<0.00020	0.0003
Arsenic (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium (total)	mg/L	0.0668	0.0456	0.054	0.0511	0.0507	0.074
Beryllium (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (total)	mg/L	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010
Boron (total)	mg/L	0.168	0.158	0.176	0.169	0.166	0.235
Cadmium (total)	mg/L	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010
Calcium (total)	mg/L	66.2	65.1	74.4	78.8	77.4	70.2
Chromium (total)	mg/L	0.00636	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt (total)	mg/L	0.00013	0.00016	0.0002	0.00017	0.00018	0.00014
Copper (total)	mg/L	0.00312	0.00379	0.00133	0.00113	0.00127	0.00215
Iron (total)	mg/L	0.013	0.053	0.034	0.033	0.032	0.042
Lead (total)	mg/L	<0.00020	0.00032	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (total)	mg/L	0.00687	0.00691	0.00769	0.00714	0.00673	0.00658
Magnesium (total)	mg/L	15.8	13.6	14.3	14.6	14.4	13
Manganese (total)	mg/L	0.0567	0.0522	0.0389	0.0401	0.0375	0.0462
Mercury (total)	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (total)	mg/L	0.00196	0.00163	0.00097	0.00113	0.00104	0.00127
Nickel (total)	mg/L	0.00044	0.00172	0.00202	0.00146	0.00168	0.00156
Selenium (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon (total, as Si)	mg/L	12.8	9.8	10.8	10.4	10.3	10.4
Silver (total)	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Sodium (total)	mg/L	80.7	95.4	93.5	88.4	87.2	96.9
Strontium (total)	mg/L	0.644	0.572	0.613	0.605	0.589	0.54
Sulphur (total)	mg/L	19.4	18.4	17.7	17.4	17.6	16.6
Tellurium (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium (total)	mg/L	<0.000020	0.000055	<0.000020	<0.000020	<0.000020	<0.000020
Thorium (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (total)	mg/L	<0.00020	0.00033	<0.00020	<0.00020	<0.00020	0.00031
Titanium (total)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (total)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (total)	mg/L	0.0055	0.00276	0.00301	0.0029	0.00277	0.00211
Vanadium (total)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (total)	mg/L	0.0294	0.0194	0.0299	0.0324	0.0322	0.0287
Zirconium (total)	mg/L	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	0.00013



APPENDIX I

Effluent Monitoring 2021 Lab Reports



CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21A0456

RECEIVED / TEMP 2021-01-07 13:00 / 2°C

REPORTED 2021-01-11 10:11

COC NUMBER B103772

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.

Work Order Comments:

Custody Seals Intact: YES

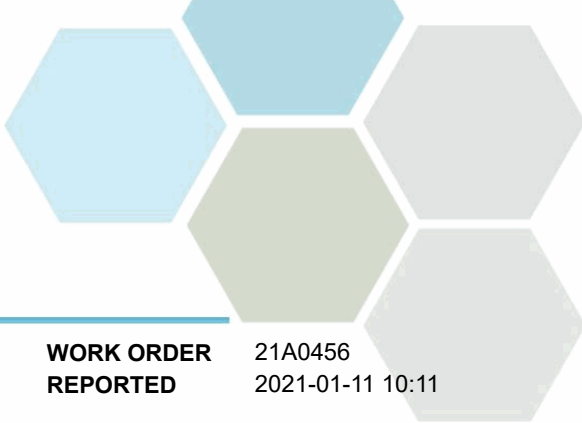
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

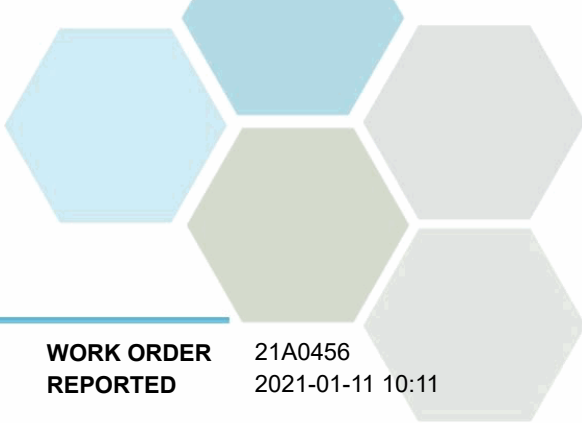


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A0456
2021-01-11 10:11

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21A0456-01) Matrix: Water Sampled: 2021-01-06 11:10					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-01-07	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-01-07	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A0456
2021-01-11 10:11

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21A0457

RECEIVED / TEMP 2021-01-07 13:00 / 2°C

REPORTED 2021-01-12 15:50

COC NUMBER B103772

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



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Work Order Comments:

Custody Seals Intact: YES

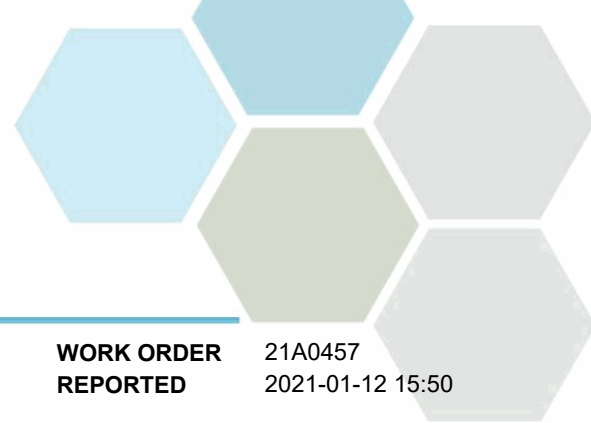
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A0457
2021-01-12 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21A0457-01) Matrix: Fresh Water Sampled: 2021-01-06 11:10					
<i>Anions</i>					
Nitrate (as N)	2.20	0.010	mg/L	2021-01-08	
Nitrite (as N)	0.064	0.010	mg/L	2021-01-08	
Phosphate (as P)	0.0088	0.0050	mg/L	2021-01-08	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.149	0.050	mg/L	2021-01-08	
Chemical Oxygen Demand	34	20	mg/L	2021-01-11	
Phosphorus, Total (as P)	0.166	0.0050	mg/L	2021-01-12	
Solids, Total Suspended	2.4	2.0	mg/L	2021-01-12	
UV Transmittance @ 254nm	68.5	0.10	% T	2021-01-08	

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A0457
2021-01-12 15:50

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21A1132

RECEIVED / TEMP 2021-01-14 12:40 / 2°C

REPORTED 2021-01-15 15:58

COC NUMBER B096296

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.

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Work Order Comments:

Custody Seals Intact: YES

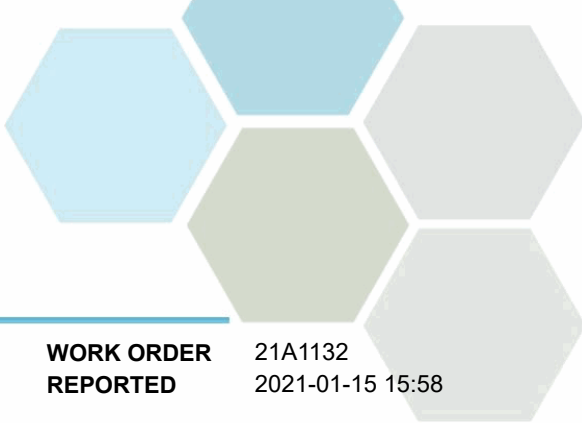
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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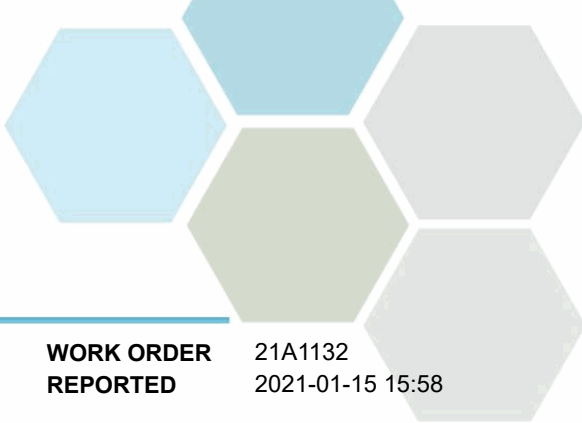


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A1132
2021-01-15 15:58

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21A1132-01) Matrix: Water Sampled: 2021-01-13 10:36					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-01-14	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-01-14	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A1132
2021-01-15 15:58

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21A1133

RECEIVED / TEMP 2021-01-14 12:40 / 2°C

REPORTED 2021-01-20 09:56

COC NUMBER B096296

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

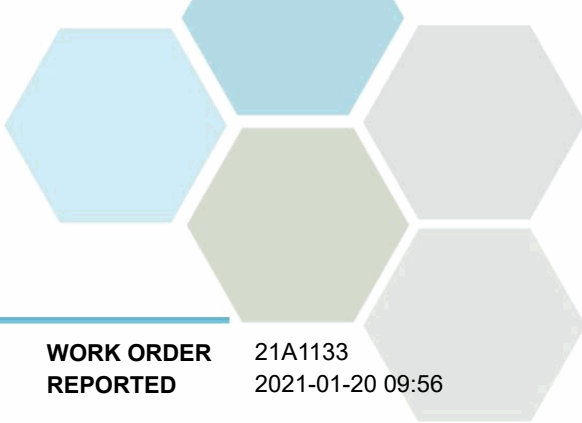
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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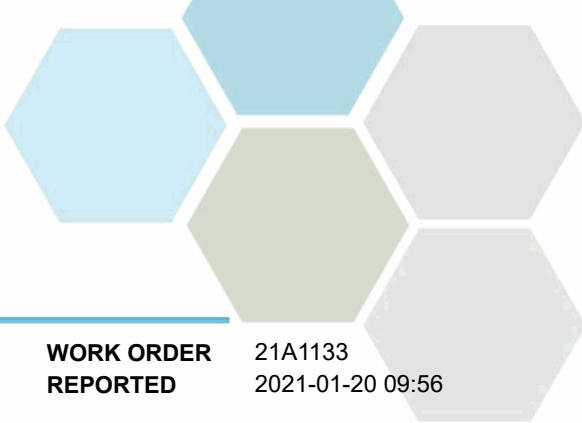


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A1133
2021-01-20 09:56

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21A1133-01) Matrix: Fresh Water Sampled: 2021-01-13 10:36					
<i>Anions</i>					
Nitrate (as N)	1.95	0.010	mg/L	2021-01-16	
Nitrite (as N)	0.035	0.010	mg/L	2021-01-16	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-01-16	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.103	0.050	mg/L	2021-01-16	
Chemical Oxygen Demand	21	20	mg/L	2021-01-18	
Phosphorus, Total (as P)	0.131	0.0050	mg/L	2021-01-18	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-01-19	
UV Transmittance @ 254nm	70.7	0.10	% T	2021-01-15	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A1133
2021-01-20 09:56

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21A1869
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-01-21 09:00 / 5°C
PO NUMBER	OK Falls WW	REPORTED	2021-01-28 13:04
PROJECT	OK Falls WWTP QCE	COC NUMBER	B096330
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

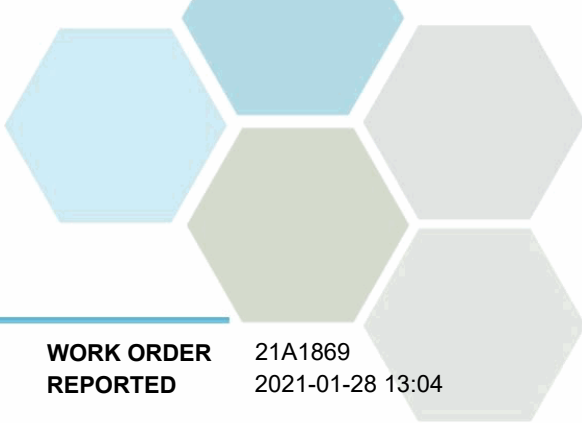
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Authorized By:

Alana Crump
Team Lead, Client Service

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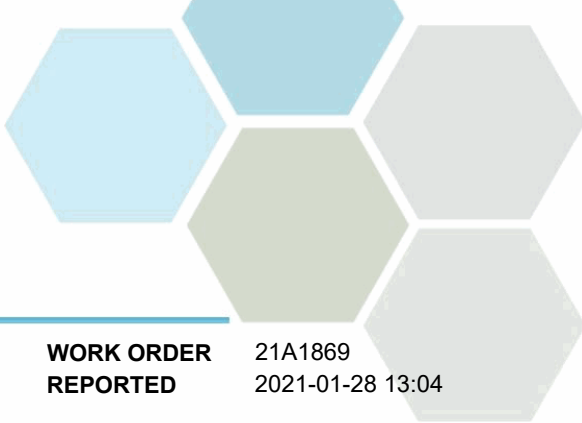


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21A1869
2021-01-28 13:04

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21A1869-01) Matrix: Water Sampled: 2021-01-20 11:20					FILT, PRES
Anions					
Chloride	102	0.10	mg/L	2021-01-23	
Fluoride	0.21	0.10	mg/L	2021-01-24	
Nitrate (as N)	2.93	0.010	mg/L	2021-01-24	HT1
Nitrite (as N)	0.022	0.010	mg/L	2021-01-24	HT1
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-01-24	HT1
Sulfate	47.8	1.0	mg/L	2021-01-24	
Calculated Parameters					
Hardness, Total (as CaCO3)	230	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	2.95	0.0100	mg/L	N/A	
Nitrogen, Total	4.39	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	259	1.0	mg/L	2021-01-24	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Alkalinity, Bicarbonate (as CaCO3)	259	1.0	mg/L	2021-01-24	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Ammonia, Total (as N)	0.096	0.050	mg/L	2021-01-22	
BOD, 5-day	1.2	2.0	mg/L	2021-01-27	
BOD, 5-day Carbonaceous	1.2	2.0	mg/L	2021-01-27	
Chemical Oxygen Demand	22	20	mg/L	2021-01-22	
Conductivity (EC)	798	2.0	µS/cm	2021-01-25	
Nitrogen, Total Kjeldahl	1.44	0.050	mg/L	2021-01-25	
pH	7.49	0.10	pH units	2021-01-24	HT2
Phosphorus, Total (as P)	0.104	0.0050	mg/L	2021-01-25	
Phosphorus, Total Dissolved	0.0404	0.0050	mg/L	2021-01-25	
Solids, Total Suspended	2.2	2.0	mg/L	2021-01-25	
UV Transmittance @ 254nm	74.7	0.10	% T	2021-01-22	
Total Metals					
Aluminum, total	0.104	0.0050	mg/L	2021-01-23	
Antimony, total	0.00020	0.00020	mg/L	2021-01-23	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-01-23	
Barium, total	0.0668	0.0050	mg/L	2021-01-23	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-01-23	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-01-23	
Boron, total	0.168	0.0500	mg/L	2021-01-23	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-01-23	
Calcium, total	66.2	0.20	mg/L	2021-01-23	
Chromium, total	0.00636	0.00050	mg/L	2021-01-23	
Cobalt, total	0.00013	0.00010	mg/L	2021-01-23	
Copper, total	0.00312	0.00040	mg/L	2021-01-23	
Iron, total	0.013	0.010	mg/L	2021-01-23	



TEST RESULTS

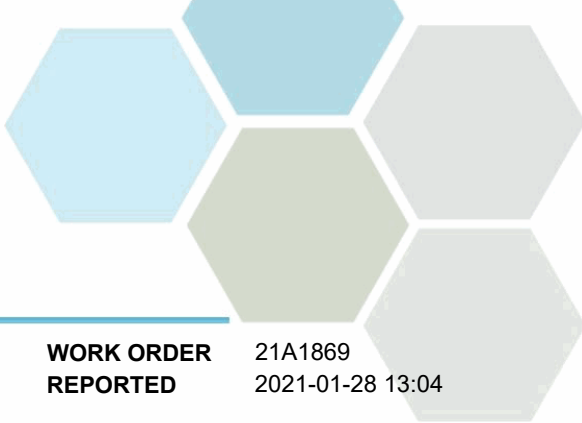
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21A1869
2021-01-28 13:04

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21A1869-01) Matrix: Water Sampled: 2021-01-20 11:20, Continued					FILT, PRES
<i>Total Metals, Continued</i>					
Lead, total	< 0.00020	0.00020	mg/L	2021-01-23	
Lithium, total	0.00687	0.00010	mg/L	2021-01-23	
Magnesium, total	15.8	0.010	mg/L	2021-01-23	
Manganese, total	0.0567	0.00020	mg/L	2021-01-23	
Mercury, total	< 0.000010	0.000010	mg/L	2021-01-22	
Molybdenum, total	0.00196	0.00010	mg/L	2021-01-23	
Nickel, total	0.00044	0.00040	mg/L	2021-01-23	
Phosphorus, total	0.118	0.050	mg/L	2021-01-23	
Potassium, total	16.4	0.10	mg/L	2021-01-23	
Selenium, total	< 0.00050	0.00050	mg/L	2021-01-23	
Silicon, total	12.8	1.0	mg/L	2021-01-23	
Silver, total	< 0.000050	0.000050	mg/L	2021-01-23	
Sodium, total	80.7	0.10	mg/L	2021-01-23	
Strontium, total	0.644	0.0010	mg/L	2021-01-23	
Sulfur, total	19.4	3.0	mg/L	2021-01-23	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-01-23	
Thallium, total	< 0.000020	0.000020	mg/L	2021-01-23	
Thorium, total	< 0.00010	0.00010	mg/L	2021-01-23	
Tin, total	< 0.00020	0.00020	mg/L	2021-01-23	
Titanium, total	< 0.0050	0.0050	mg/L	2021-01-23	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-01-23	
Uranium, total	0.00550	0.000020	mg/L	2021-01-23	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-01-23	
Zinc, total	0.0294	0.0040	mg/L	2021-01-23	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-01-23	

Sample Qualifiers:

- FILT The sample has been filtered for DP in the laboratory. Results may not reflect conditions at the time of sampling.
- 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.
- PRES Sample has been preserved for DP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

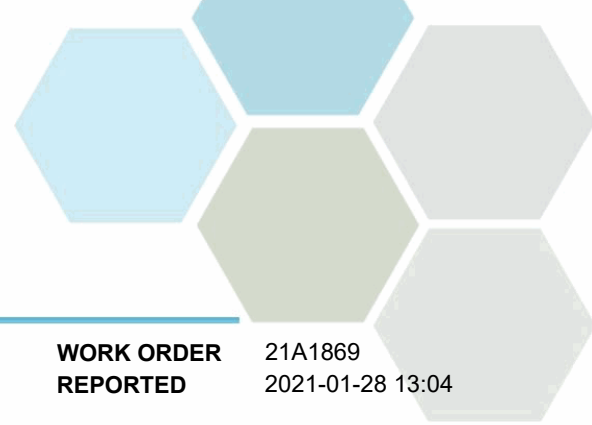
WORK ORDER REPORTED 21A1869
2021-01-28 13:04

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
- % T Percent Transmittance
- < 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
- pH units pH < 7 = acidic, pH > 7 = basic
- µS/cm Microsiemens per centimetre
- 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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21A1869
2021-01-28 13:04

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QCE

PROJECT INFO

WORK ORDER 21A1877

RECEIVED / TEMP 2021-01-21 09:00 / 5°C

REPORTED 2021-01-25 12:31

COC NUMBER B096330

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



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Work Order Comments:

Custody Seals Intact: YES

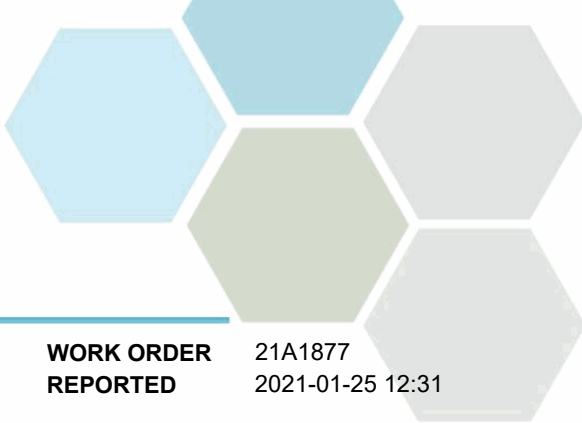
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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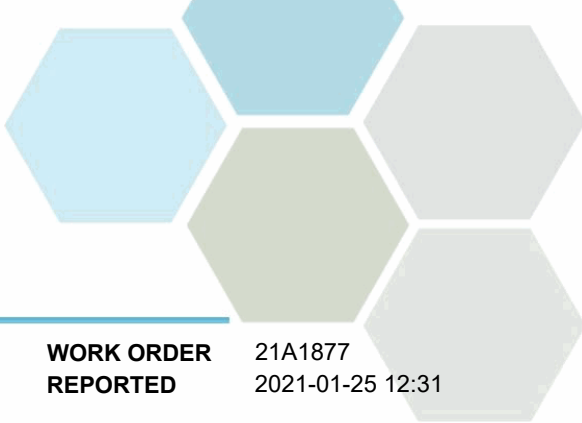


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21A1877
2021-01-25 12:31

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21A1877-01) Matrix: Water Sampled: 2021-01-20 11:20					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-01-21	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-01-21	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21A1877
2021-01-25 12:31

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21A2644

RECEIVED / TEMP 2021-01-28 11:40 / 6°C

REPORTED 2021-02-01 11:02

COC NUMBER B096344

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.

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Work Order Comments:

Custody Seals Intact: YES

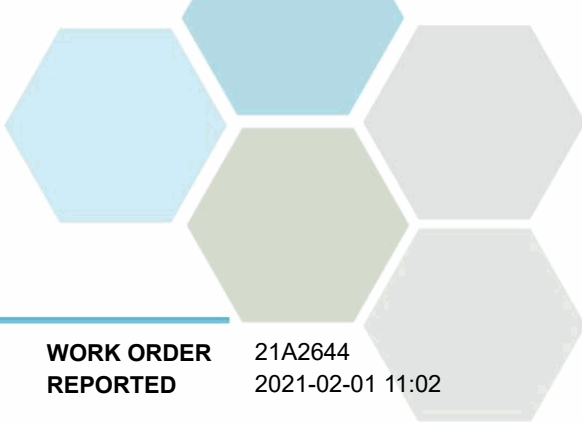
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Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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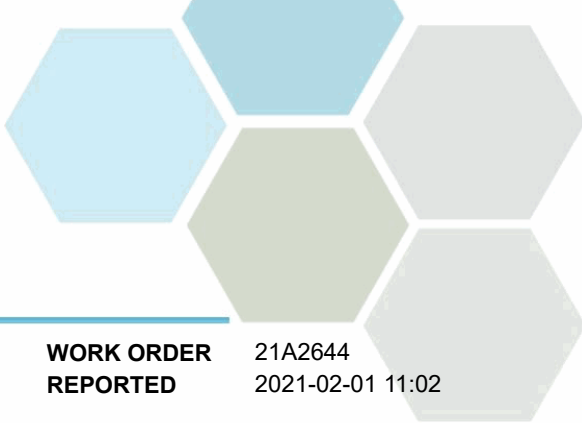


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A2644
2021-02-01 11:02

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21A2644-01) Matrix: Water Sampled: 2021-01-27 12:45					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-01-28	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-01-28	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A2644
2021-02-01 11:02

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21A2646

RECEIVED / TEMP 2021-01-28 11:40 / 6°C

REPORTED 2021-02-04 13:47

COC NUMBER B096344

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.

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Work Order Comments:

Custody Seals Intact: YES

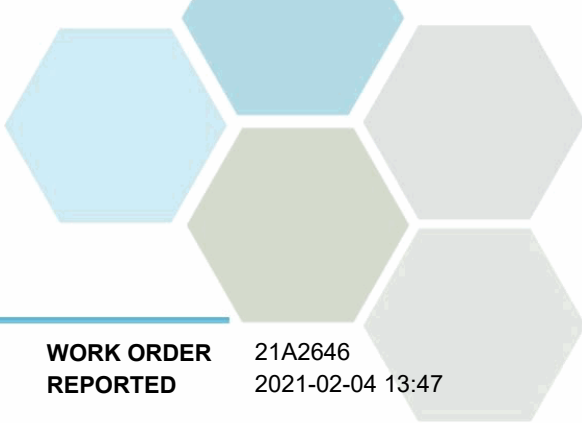
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Authorized By:

Alana Crump
Team Lead, Client Service

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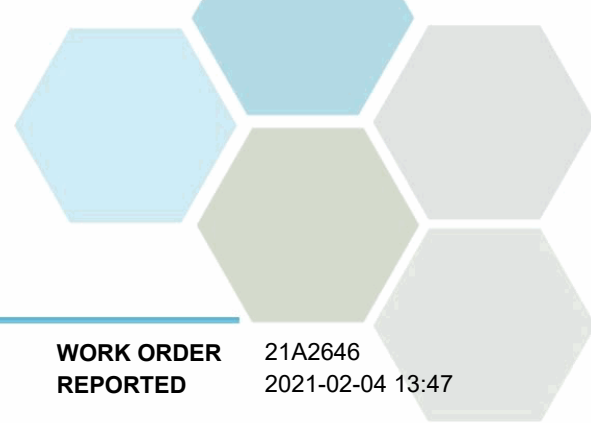


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A2646
2021-02-04 13:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21A2646-01) Matrix: Fresh Water Sampled: 2021-01-27 12:45					
<i>Anions</i>					
Nitrate (as N)	2.36	0.010	mg/L	2021-01-28	
Nitrite (as N)	0.010	0.010	mg/L	2021-01-28	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-01-28	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.080	0.050	mg/L	2021-02-01	
Chemical Oxygen Demand	31	20	mg/L	2021-02-03	
Phosphorus, Total (as P)	0.152	0.0050	mg/L	2021-02-01	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-02-02	
UV Transmittance @ 254nm	72.0	0.10	% T	2021-01-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21A2646
2021-02-04 13:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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% T	Percent Transmittance
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mg/L	Milligrams per litre
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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21B0469

RECEIVED / TEMP 2021-02-04 08:30 / 3°C

REPORTED 2021-02-08 10:51

COC NUMBER B104519

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

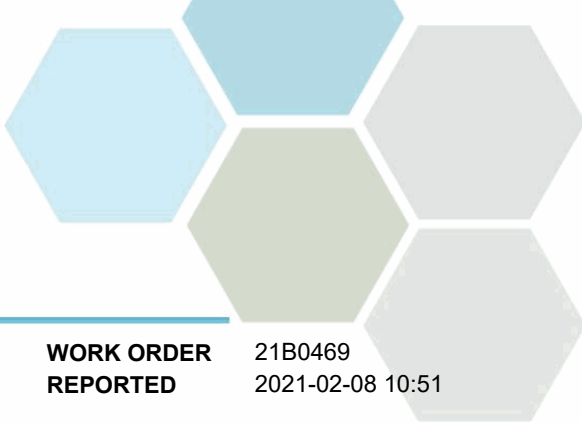
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Authorized By:

Alana Crump
Team Lead, Client Service

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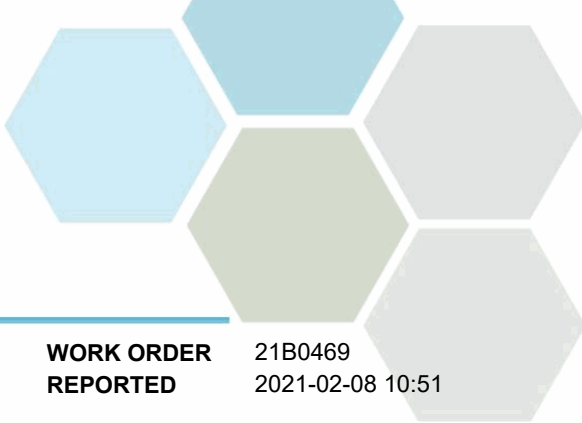


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B0469
2021-02-08 10:51

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21B0469-01) Matrix: Water Sampled: 2021-02-03 10:53					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-02-04	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-02-04	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B0469
2021-02-08 10:51

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21B0471

RECEIVED / TEMP 2021-02-04 08:30 / 3°C

REPORTED 2021-02-11 09:13

COC NUMBER B104519

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

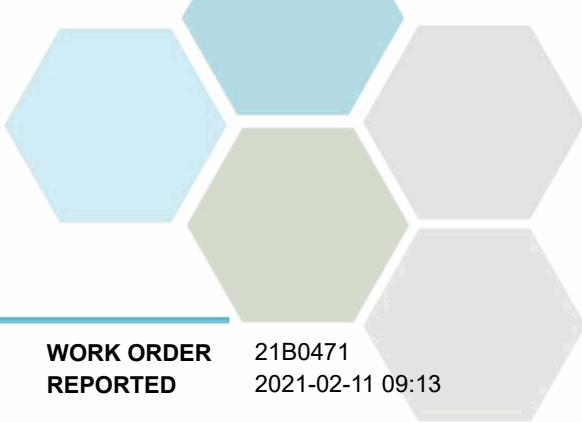
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Authorized By:

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Team Lead, Client Service

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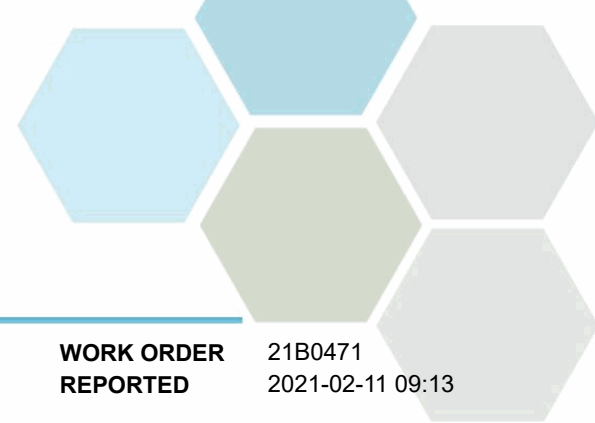


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B0471
2021-02-11 09:13

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21B0471-01) Matrix: Fresh Water Sampled: 2021-02-03 10:53					
<i>Anions</i>					
Nitrate (as N)	3.14	0.010	mg/L	2021-02-04	
Nitrite (as N)	0.016	0.010	mg/L	2021-02-04	
Phosphate (as P)	0.0185	0.0050	mg/L	2021-02-04	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.125	0.050	mg/L	2021-02-04	
Chemical Oxygen Demand	34	20	mg/L	2021-02-11	
Phosphorus, Total (as P)	0.157	0.0050	mg/L	2021-02-05	
Solids, Total Suspended	3.4	2.0	mg/L	2021-02-05	
UV Transmittance @ 254nm	67.1	0.10	% T	2021-02-06	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B0471
2021-02-11 09:13

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21B1126

RECEIVED / TEMP 2021-02-10 12:05 / 6°C

REPORTED 2021-02-12 12:55

COC NUMBER B104520

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.

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Work Order Comments:

Custody Seals Intact: YES

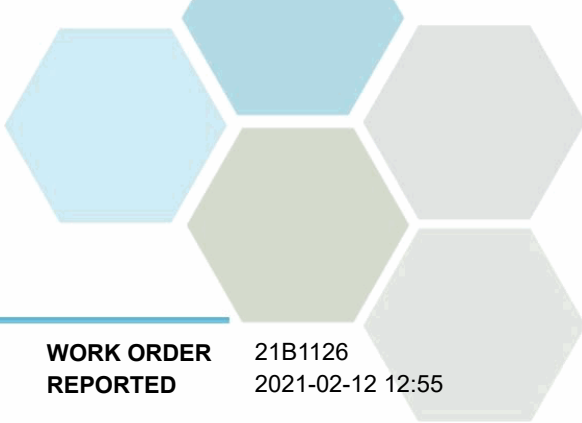
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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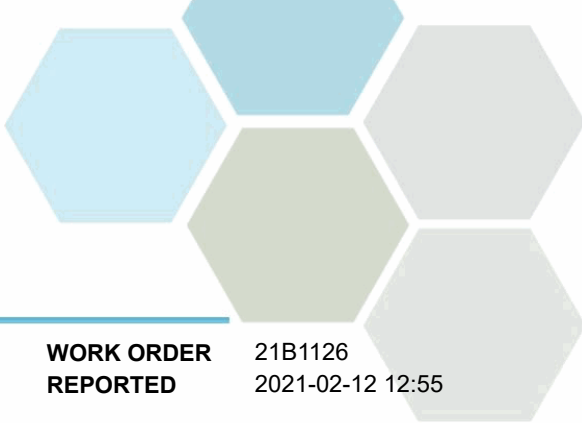


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B1126
2021-02-12 12:55

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21B1126-01) Matrix: Water Sampled: 2021-02-09 10:40					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-02-10	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-02-10	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B1126
2021-02-12 12:55

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21B1127

RECEIVED / TEMP 2021-02-10 12:05 / 6°C

REPORTED 2021-02-18 10:45

COC NUMBER B104520

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

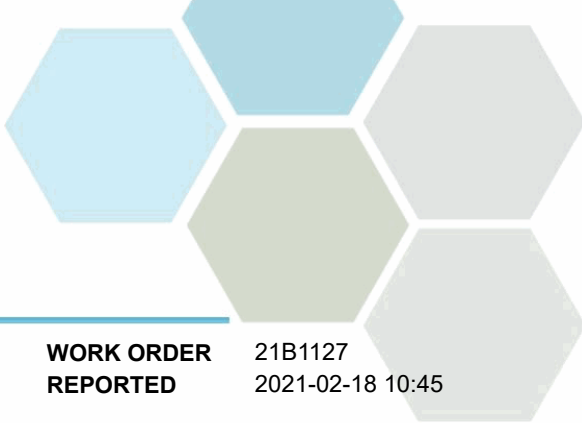
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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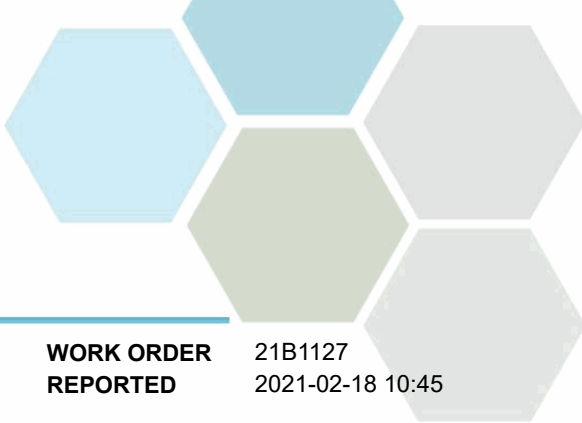


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B1127
2021-02-18 10:45

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21B1127-01) Matrix: Fresh Water Sampled: 2021-02-09 10:40					
<i>Anions</i>					
Nitrate (as N)	4.11	0.010	mg/L	2021-02-10	
Nitrite (as N)	0.045	0.010	mg/L	2021-02-10	
Phosphate (as P)	0.0283	0.0050	mg/L	2021-02-10	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.179	0.050	mg/L	2021-02-11	
Chemical Oxygen Demand	31	20	mg/L	2021-02-17	
Phosphorus, Total (as P)	0.117	0.0050	mg/L	2021-02-12	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-02-12	
UV Transmittance @ 254nm	70.1	0.10	% T	2021-02-11	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B1127
2021-02-18 10:45

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCE

PROJECT INFO

WORK ORDER 21B1885

RECEIVED / TEMP 2021-02-18 12:00 / 2°C

REPORTED 2021-02-19 13:41

COC NUMBER B104521

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.

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Work Order Comments:

Custody Seals Intact: YES

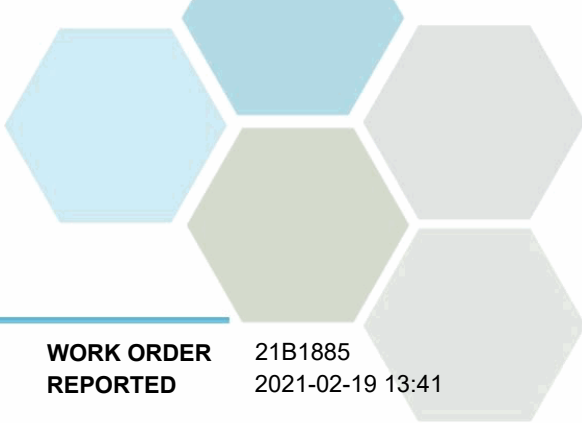
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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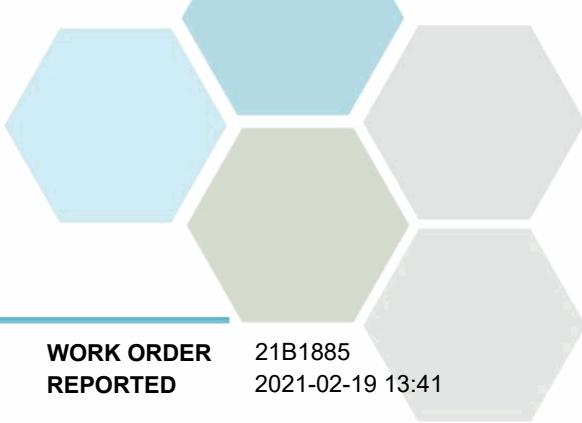


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21B1885
2021-02-19 13:41

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE Bacterial (21B1885-01) Matrix: Water Sampled: 2021-02-17 10:30					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-02-18	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-02-18	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21B1885
2021-02-19 13:41

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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MPN/100 mL	Most Probable Number per 100 millilitres
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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCE

PROJECT INFO

WORK ORDER 21B1886

RECEIVED / TEMP 2021-02-18 12:00 / 2°C

REPORTED 2021-02-25 15:02

COC NUMBER B104521

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

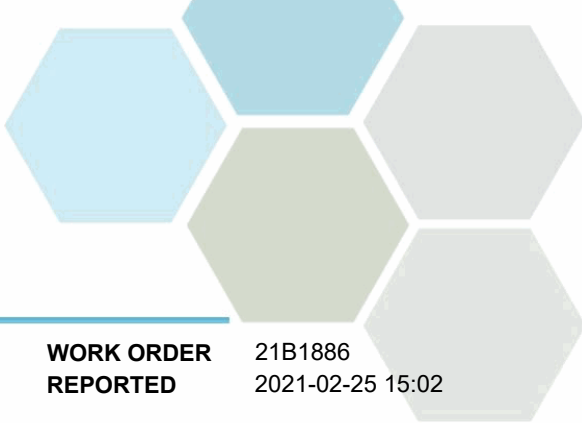
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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TEST RESULTS

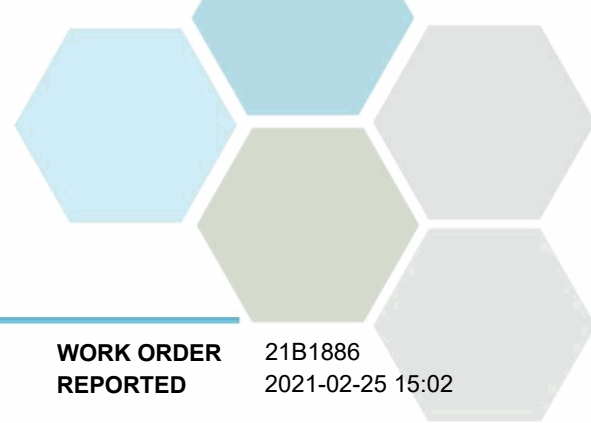
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21B1886
2021-02-25 15:02

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE (21B1886-01) Matrix: Water Sampled: 2021-02-17 10:30					FILT, PRES
Anions					
Nitrate (as N)	3.35	0.010	mg/L	2021-02-19	
Nitrite (as N)	0.062	0.010	mg/L	2021-02-19	
Phosphate (as P)	0.0071	0.0050	mg/L	2021-02-19	
Calculated Parameters					
Nitrate+Nitrite (as N)	3.41	0.0100	mg/L	N/A	
Nitrogen, Total	5.67	0.0500	mg/L	N/A	
Nitrogen, Organic	1.68	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	0.578	0.050	mg/L	2021-02-19	
BOD, 5-day	6.1	2.0	mg/L	2021-02-24	
BOD, 5-day Carbonaceous	6.3	2.0	mg/L	2021-02-24	
Chemical Oxygen Demand	35	20	mg/L	2021-02-25	
Nitrogen, Total Kjeldahl	2.26	0.050	mg/L	2021-02-23	
pH	7.75	0.10	pH units	2021-02-22	HT2
Phosphorus, Total (as P)	0.148	0.0050	mg/L	2021-02-19	
Phosphorus, Total Dissolved	0.0722	0.0050	mg/L	2021-02-19	
Solids, Total Suspended	2.6	2.0	mg/L	2021-02-20	
UV Transmittance @ 254nm	67.4	0.10	% T	2021-02-19	

Sample Qualifiers:

- FILT The sample has been filtered for DP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for DP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21B1886
2021-02-25 15:02

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21B2540

RECEIVED / TEMP 2021-02-24 08:30 / 2°C

REPORTED 2021-02-26 10:57

COC NUMBER B104522

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.

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Work Order Comments:

Custody Seals Intact: YES

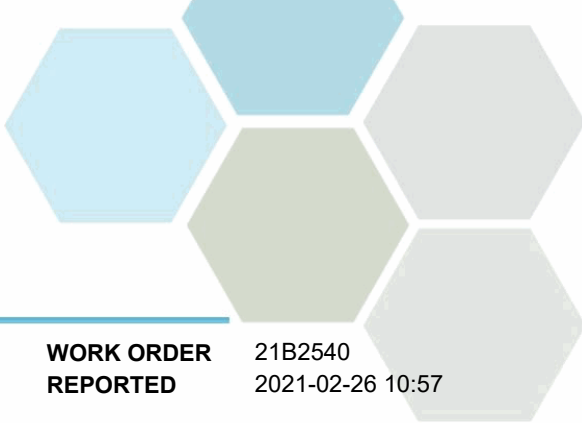
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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TEST RESULTS

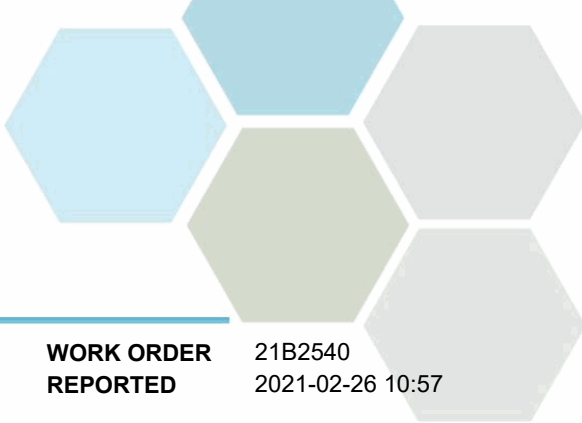
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B2540
2021-02-26 10:57

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21B2540-01) Matrix: Water Sampled: 2021-02-23 09:50					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-02-24	HT3
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-02-24	HT3

Sample Qualifiers:

HT3 Microbiological analysis was initiated beyond the maximum holding time of 30 hours. Results may not be valid.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B2540
2021-02-26 10:57

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21B2541

RECEIVED / TEMP 2021-02-24 08:30 / 2°C

REPORTED 2021-03-02 13:33

COC NUMBER B104522

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



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Work Order Comments:

Custody Seals Intact: YES

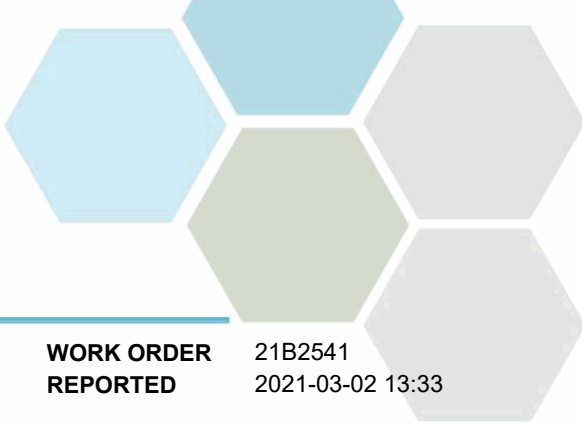
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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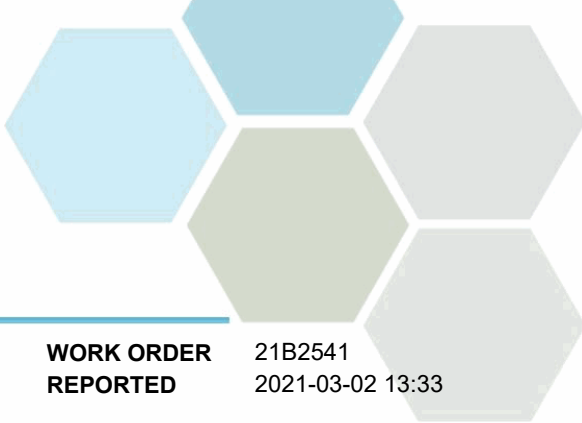


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B2541
2021-03-02 13:33

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21B2541-01) Matrix: Fresh Water Sampled: 2021-02-23 09:50					
<i>Anions</i>					
Nitrate (as N)	3.22	0.010	mg/L	2021-02-24	
Nitrite (as N)	0.070	0.010	mg/L	2021-02-24	
Phosphate (as P)	0.0191	0.0050	mg/L	2021-02-24	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.360	0.050	mg/L	2021-02-25	
Chemical Oxygen Demand	40	20	mg/L	2021-02-25	
Phosphorus, Total (as P)	0.169	0.0050	mg/L	2021-03-01	
Solids, Total Suspended	2.0	2.0	mg/L	2021-02-26	
UV Transmittance @ 254nm	67.0	0.10	% T	2021-02-25	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21B2541
2021-03-02 13:33

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21C0597

RECEIVED / TEMP 2021-03-04 08:30 / 3°C

REPORTED 2021-03-08 10:46

COC NUMBER B104523

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.

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Work Order Comments:

Custody Seals Intact: YES

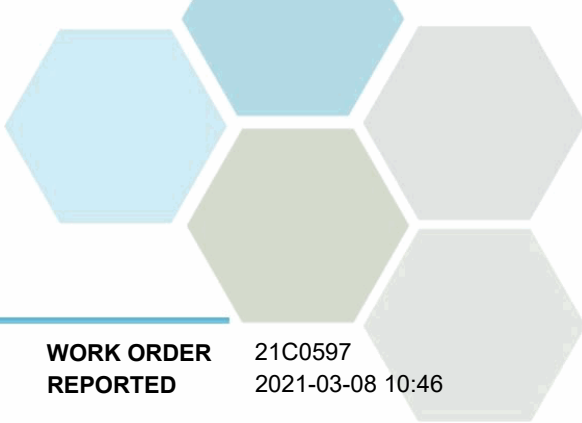
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Authorized By:

Alana Crump
Team Lead, Client Service

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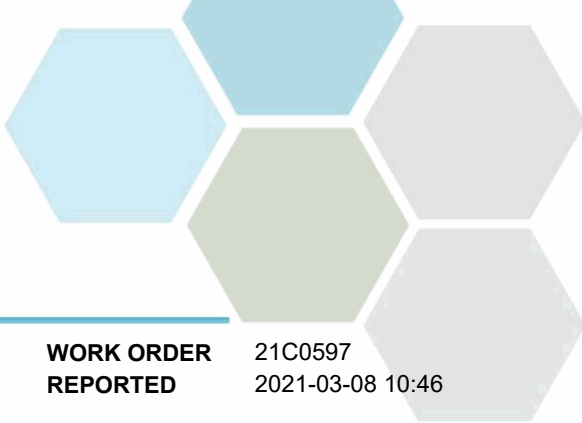


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C0597
2021-03-08 10:46

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21C0597-01) Matrix: Water Sampled: 2021-03-03 10:43					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-03-04	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-03-04	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C0597
2021-03-08 10:46

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21C0600

RECEIVED / TEMP 2021-03-04 08:30 / 3°C

REPORTED 2021-03-10 13:07

COC NUMBER B104523

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.

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Work Order Comments:

Custody Seals Intact: YES

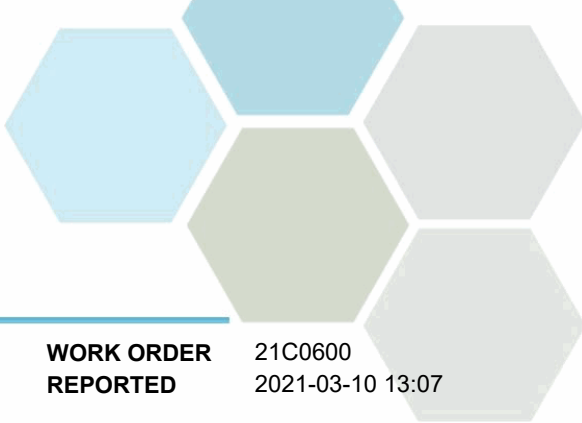
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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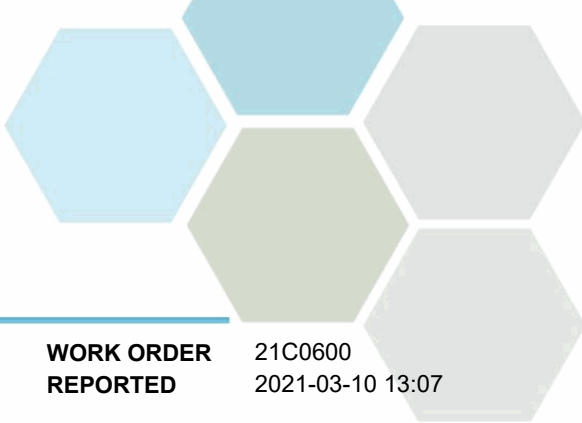


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C0600
2021-03-10 13:07

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21C0600-01) Matrix: Fresh Water Sampled: 2021-03-03 10:43					
<i>Anions</i>					
Nitrate (as N)	2.88	0.010	mg/L	2021-03-04	
Nitrite (as N)	0.132	0.010	mg/L	2021-03-04	
Phosphate (as P)	0.0399	0.0050	mg/L	2021-03-04	
<i>General Parameters</i>					
Ammonia, Total (as N)	1.41	0.050	mg/L	2021-03-04	
Chemical Oxygen Demand	48	20	mg/L	2021-03-09	
Phosphorus, Total (as P)	0.279	0.0050	mg/L	2021-03-08	
Solids, Total Suspended	3.4	2.0	mg/L	2021-03-09	
UV Transmittance @ 254nm	67.0	0.10	% T	2021-03-04	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C0600
2021-03-10 13:07

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21C1446

RECEIVED / TEMP 2021-03-10 08:30 / 4°C

REPORTED 2021-03-12 09:51

COC NUMBER B104524

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.

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Work Order Comments:

Custody Seals Intact: YES

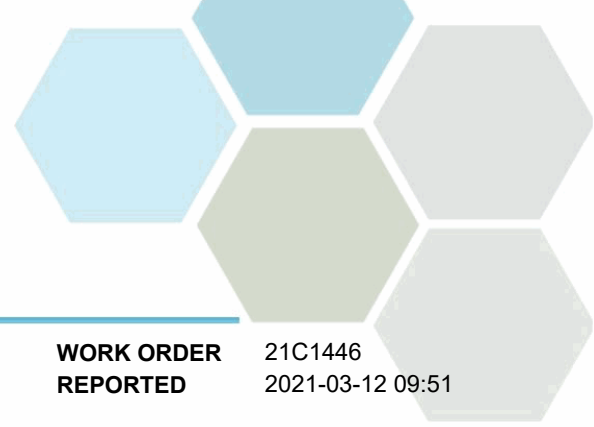
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Authorized By:

Alana Crump
Team Lead, Client Service

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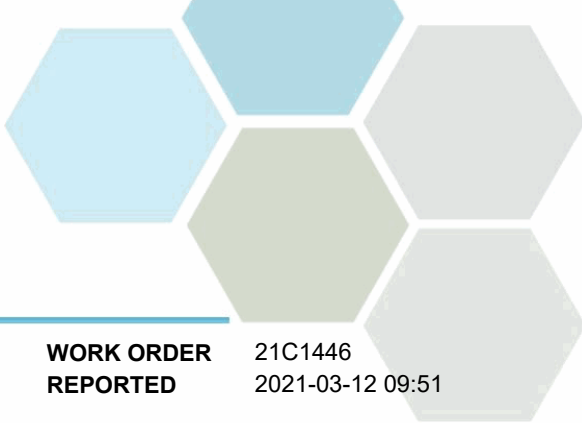


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C1446
2021-03-12 09:51

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21C1446-01) Matrix: Water Sampled: 2021-03-09 10:55					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	6	1	MPN/100 mL	2021-03-10	
E. coli (Q-Tray)	6	1	MPN/100 mL	2021-03-10	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C1446
2021-03-12 09:51

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21C1447

RECEIVED / TEMP 2021-03-10 08:30 / 4°C

REPORTED 2021-03-17 16:42

COC NUMBER B104524

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

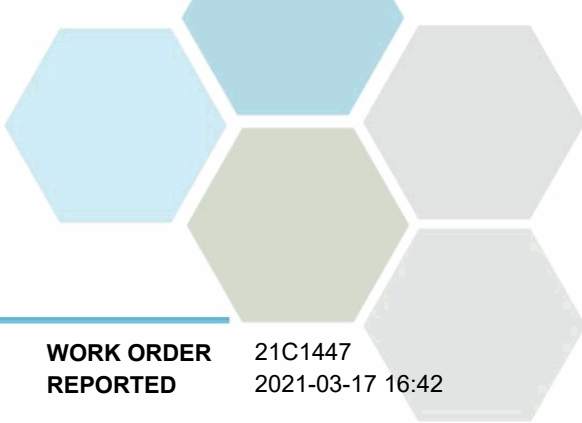
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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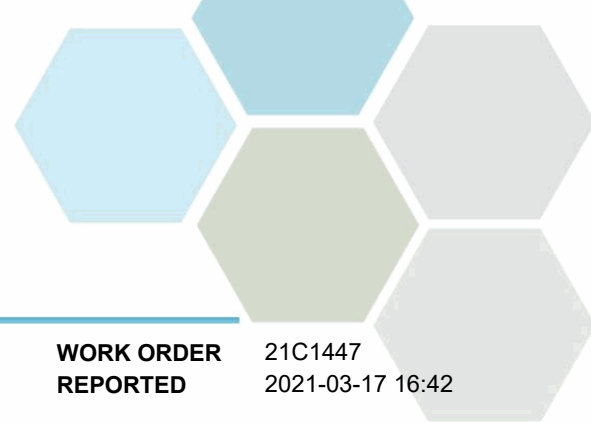


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C1447
2021-03-17 16:42

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21C1447-01) Matrix: Fresh Water Sampled: 2021-03-09 10:55					
<i>Anions</i>					
Nitrate (as N)	1.33	0.010	mg/L	2021-03-11	
Nitrite (as N)	0.043	0.010	mg/L	2021-03-11	
Phosphate (as P)	0.0111	0.0050	mg/L	2021-03-11	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.338	0.050	mg/L	2021-03-10	
Chemical Oxygen Demand	52	20	mg/L	2021-03-17	
Phosphorus, Total (as P)	0.288	0.0050	mg/L	2021-03-15	
Solids, Total Suspended	4.0	2.0	mg/L	2021-03-13	
UV Transmittance @ 254nm	66.0	0.10	% T	2021-03-12	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C1447
2021-03-17 16:42

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21C2368

RECEIVED / TEMP 2021-03-17 11:40 / 4°C

REPORTED 2021-03-25 11:58

COC NUMBER B104525

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.

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Work Order Comments:

Custody Seals Intact: YES

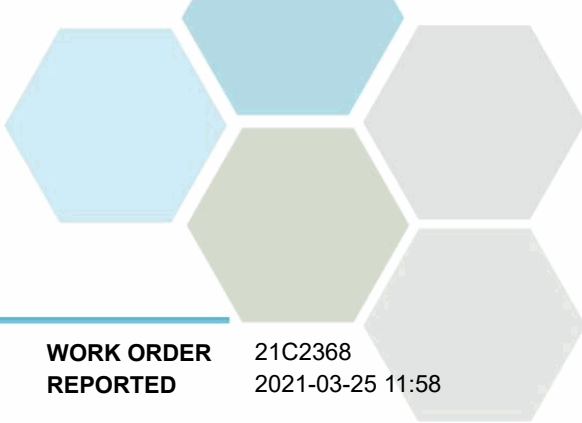
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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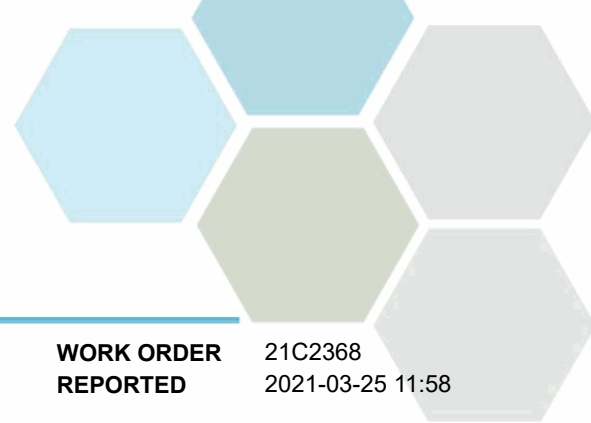


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C2368
2021-03-25 11:58

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21C2368-01) Matrix: Fresh Water Sampled: 2021-03-16 10:43					
<i>Anions</i>					
Nitrate (as N)	1.05	0.010	mg/L	2021-03-18	
Nitrite (as N)	0.039	0.010	mg/L	2021-03-18	
Phosphate (as P)	0.0541	0.0050	mg/L	2021-03-18	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.219	0.050	mg/L	2021-03-18	
Chemical Oxygen Demand	34	20	mg/L	2021-03-25	
Phosphorus, Total (as P)	0.201	0.0050	mg/L	2021-03-23	
Solids, Total Suspended	2.0	2.0	mg/L	2021-03-19	
UV Transmittance @ 254nm	71.9	0.10	% T	2021-03-19	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C2368
2021-03-25 11:58

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21C2370

RECEIVED / TEMP 2021-03-17 11:40 / 4°C

REPORTED 2021-03-19 11:43

COC NUMBER B104525

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.

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Work Order Comments:

Custody Seals Intact: YES

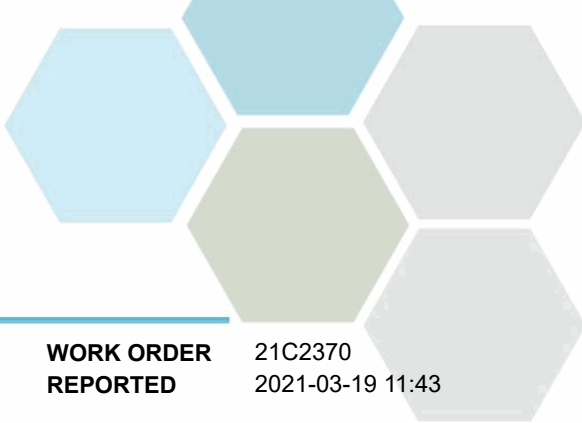
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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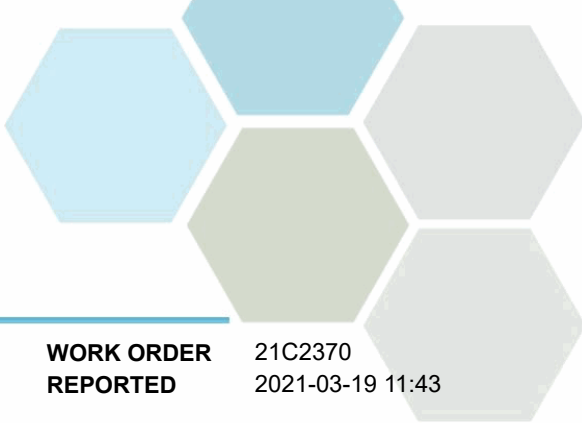


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C2370
2021-03-19 11:43

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21C2370-01) Matrix: Water Sampled: 2021-03-16 10:43					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-03-17	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-03-17	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C2370
2021-03-19 11:43

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCE

PROJECT INFO

WORK ORDER 21C3465

RECEIVED / TEMP 2021-03-25 12:30 / 6°C

REPORTED 2021-03-29 10:49

COC NUMBER B104527

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.

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Work Order Comments:

Custody Seals Intact: YES

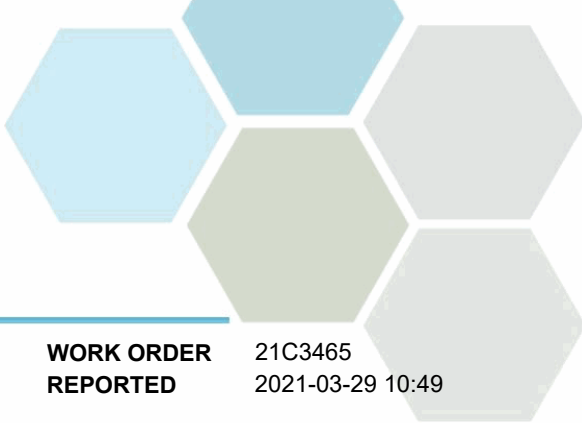
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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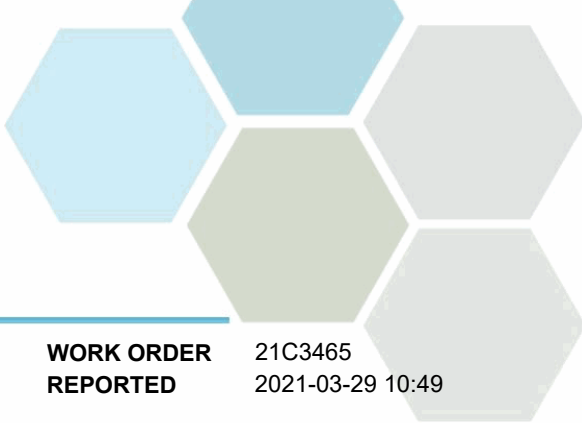


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21C3465
2021-03-29 10:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE Bacterial (21C3465-01) Matrix: Water Sampled: 2021-03-24 10:30					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-03-25	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-03-25	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21C3465
2021-03-29 10:49

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCE

PROJECT INFO

WORK ORDER 21C3466

RECEIVED / TEMP 2021-03-25 12:30 / 6°C

REPORTED 2021-04-01 13:47

COC NUMBER B104527

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

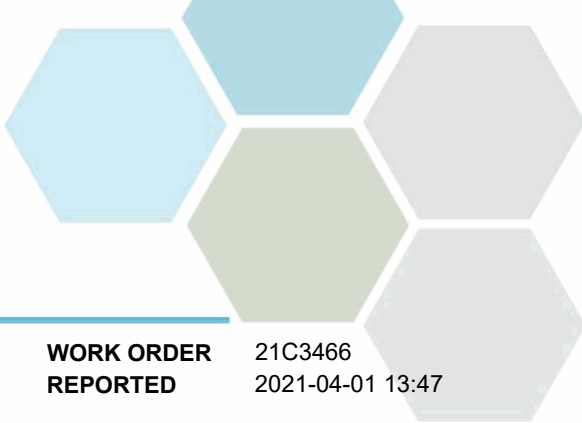
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Authorized By:

Alana Crump
Team Lead, Client Service

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TEST RESULTS

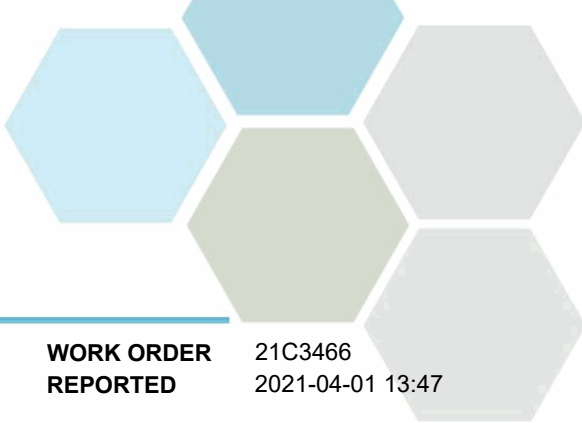
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21C3466
2021-04-01 13:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE (21C3466-01) Matrix: Water Sampled: 2021-03-24 10:30					FILT, PRES
Anions					
Nitrate (as N)	0.721	0.010	mg/L	2021-03-26	
Nitrite (as N)	0.018	0.010	mg/L	2021-03-26	
Phosphate (as P)	0.0107	0.0050	mg/L	2021-03-26	
Calculated Parameters					
Nitrate+Nitrite (as N)	0.739	0.0100	mg/L	N/A	
Nitrogen, Total	2.27	0.0500	mg/L	N/A	
Nitrogen, Organic	1.42	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	0.109	0.050	mg/L	2021-03-26	
BOD, 5-day	1.8	2.0	mg/L	2021-03-31	
BOD, 5-day Carbonaceous	1.7	2.0	mg/L	2021-03-31	
Chemical Oxygen Demand	35	20	mg/L	2021-04-01	
Nitrogen, Total Kjeldahl	1.53	0.050	mg/L	2021-03-31	
pH	7.70	0.10	pH units	2021-03-31	HT2
Phosphorus, Total (as P)	0.147	0.0050	mg/L	2021-03-30	
Phosphorus, Total Dissolved	0.0729	0.0050	mg/L	2021-03-30	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-03-30	
UV Transmittance @ 254nm	71.8	0.10	% T	2021-03-27	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

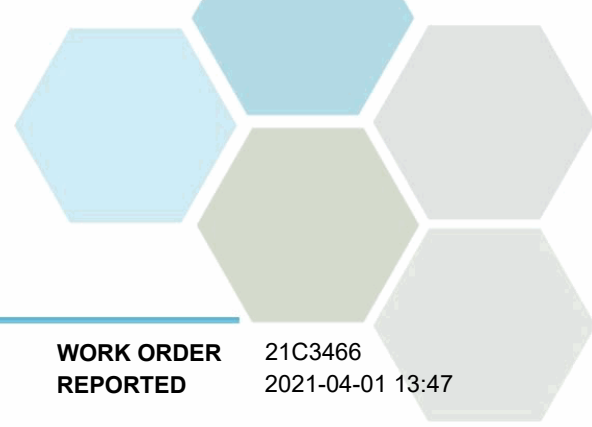
WORK ORDER REPORTED 21C3466
2021-04-01 13:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21C3466
2021-04-01 13:47

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21C4044

RECEIVED / TEMP 2021-03-31 09:00 / 3°C

REPORTED 2021-04-06 13:51

COC NUMBER B104528

Introduction:

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Big Picture Sidekicks



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Work Order Comments:

Custody Seals Intact: YES

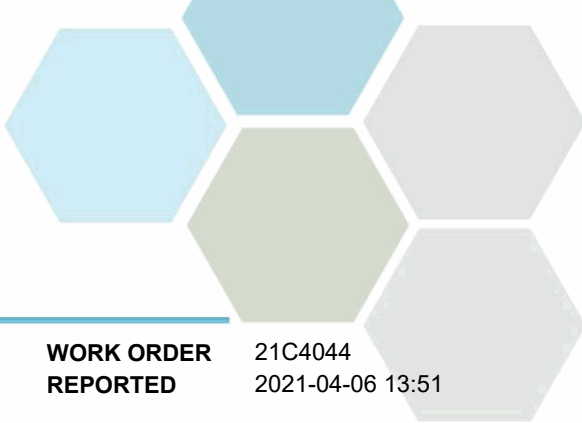
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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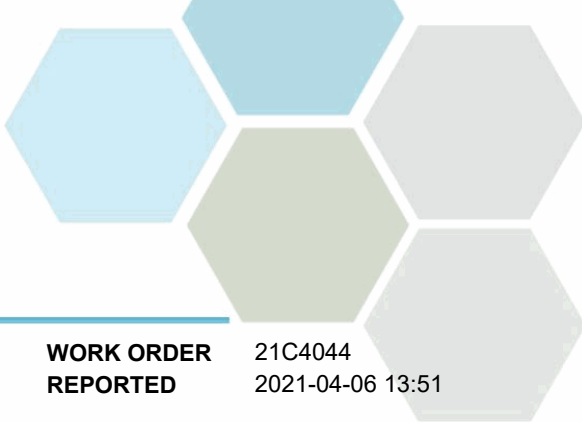


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C4044
2021-04-06 13:51

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21C4044-01) Matrix: Water Sampled: 2021-03-30 11:33					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-03-31	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-03-31	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C4044
2021-04-06 13:51

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21C4049

RECEIVED / TEMP 2021-03-31 09:00 / 3°C

REPORTED 2021-04-09 12:52

COC NUMBER B104528

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.

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Work Order Comments:

Custody Seals Intact: YES

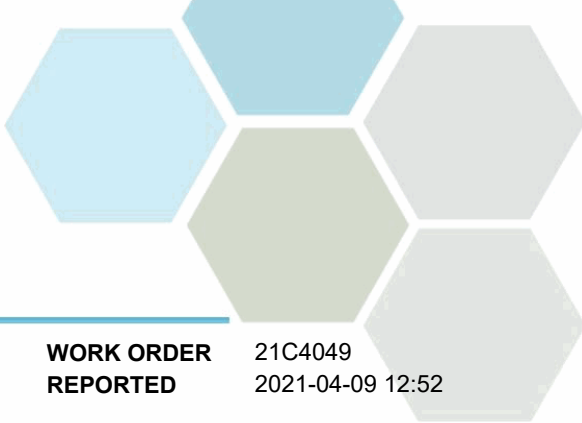
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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TEST RESULTS

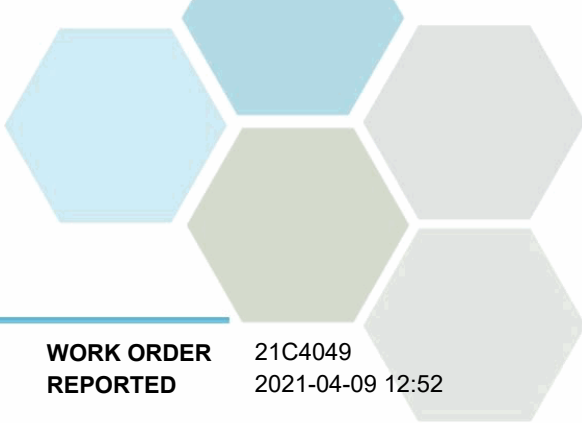
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C4049
2021-04-09 12:52

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21C4049-01) Matrix: Fresh Water Sampled: 2021-03-30 11:33					PRES
Anions					
Nitrate (as N)	0.384	0.010	mg/L	2021-04-01	
Nitrite (as N)	0.014	0.010	mg/L	2021-04-01	
Phosphate (as P)	0.0223	0.0050	mg/L	2021-04-01	
General Parameters					
Ammonia, Total (as N)	0.109	0.050	mg/L	2021-04-01	
Chemical Oxygen Demand	31	20	mg/L	2021-04-09	
Phosphorus, Total (as P)	0.157	0.0050	mg/L	2021-04-06	
Solids, Total Suspended	2.0	2.0	mg/L	2021-04-06	
UV Transmittance @ 254nm	61.1	0.10	% T	2021-04-02	

Sample Qualifiers:

PRES Sample has been preserved for NH3, TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21C4049
2021-04-09 12:52

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21D0533

RECEIVED / TEMP 2021-04-07 11:40 / 8°C

REPORTED 2021-04-09 11:52

COC NUMBER B104529

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

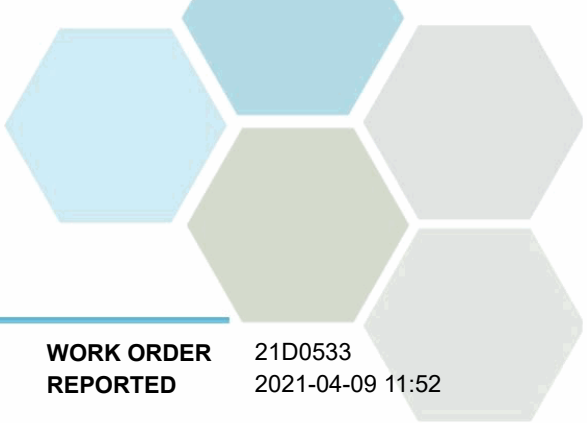
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Authorized By:

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Team Lead, Client Service

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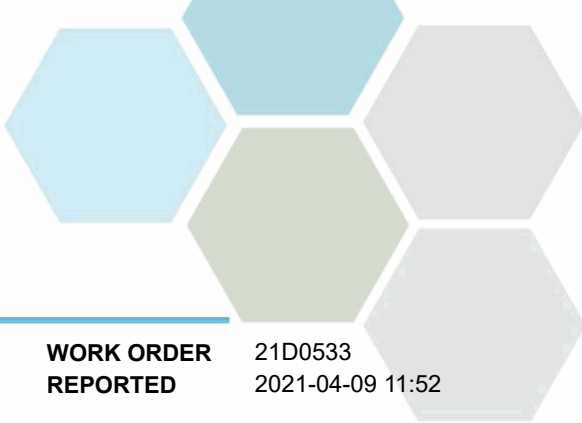


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D0533
2021-04-09 11:52

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21D0533-01) Matrix: Water Sampled: 2021-04-06 11:25					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-04-07	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-04-07	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D0533
2021-04-09 11:52

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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MPN/100 mL	Most Probable Number per 100 millilitres
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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21D0545

RECEIVED / TEMP 2021-04-07 11:40 / 8°C

REPORTED 2021-04-12 13:49

COC NUMBER B104529

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

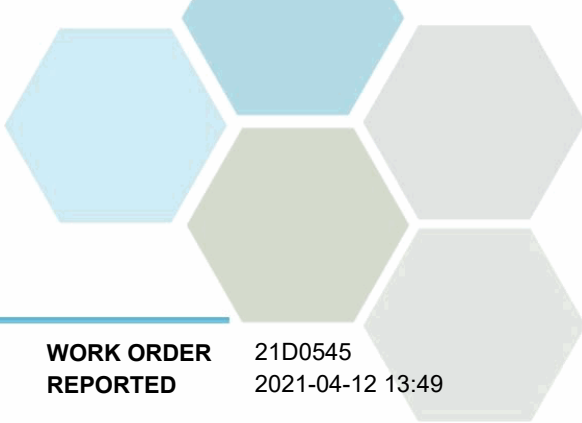
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Authorized By:

Alana Crump
Team Lead, Client Service

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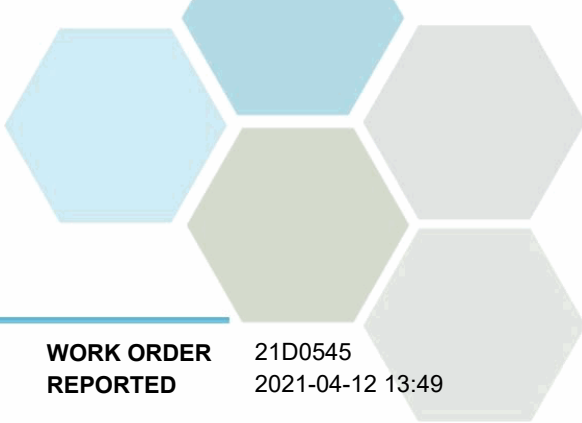


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D0545
2021-04-12 13:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21D0545-01) Matrix: Fresh Water Sampled: 2021-04-06 11:25					
<i>Anions</i>					
Nitrate (as N)	0.058	0.010	mg/L	2021-04-08	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-08	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-08	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.098	0.050	mg/L	2021-04-08	
Chemical Oxygen Demand	48	20	mg/L	2021-04-09	
Phosphorus, Total (as P)	0.160	0.0050	mg/L	2021-04-09	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-04-09	
UV Transmittance @ 254nm	71.0	0.10	% T	2021-04-08	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D0545
2021-04-12 13:49

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21D1597

RECEIVED / TEMP 2021-04-15 13:20 / 6°C

REPORTED 2021-04-19 15:48

COC NUMBER B104530

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

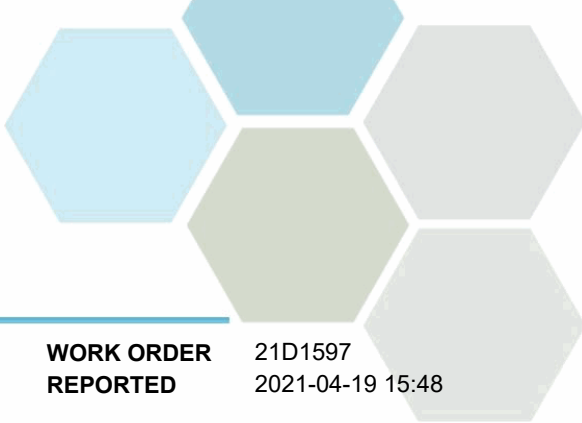
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Authorized By:

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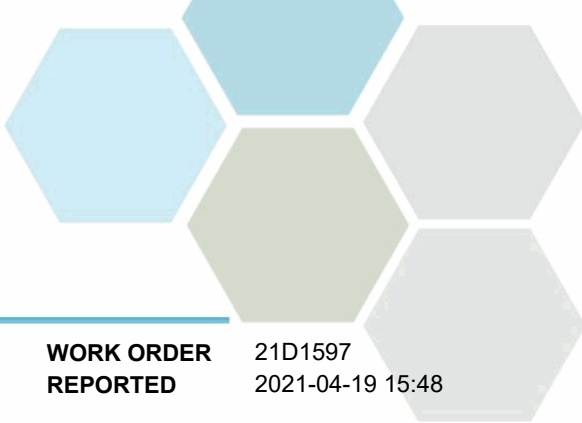


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D1597
2021-04-19 15:48

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21D1597-01) Matrix: Water Sampled: 2021-04-14 10:37					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-04-15	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-04-15	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D1597
2021-04-19 15:48

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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MPN/100 mL	Most Probable Number per 100 millilitres
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21D1599
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-04-15 13:20 / 6°C 2021-04-21 13:46
PO NUMBER	OK Falls WW	COC NUMBER	B104530
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

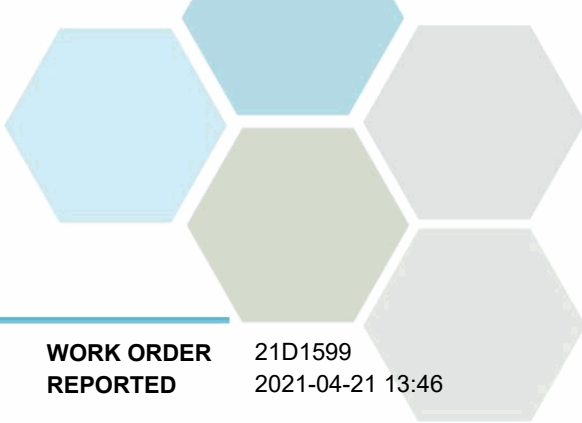
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Team Lead, Client Service

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#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

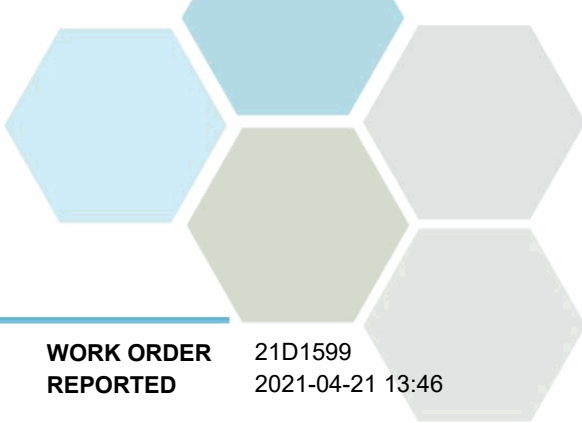


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D1599
2021-04-21 13:46

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21D1599-01) Matrix: Fresh Water Sampled: 2021-04-14 10:37					
<i>Anions</i>					
Nitrate (as N)	0.180	0.010	mg/L	2021-04-15	
Nitrite (as N)	0.019	0.010	mg/L	2021-04-15	
Phosphate (as P)	0.0054	0.0050	mg/L	2021-04-15	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.212	0.050	mg/L	2021-04-19	
Chemical Oxygen Demand	28	20	mg/L	2021-04-21	
Phosphorus, Total (as P)	0.137	0.0050	mg/L	2021-04-19	
Solids, Total Suspended	2.0	2.0	mg/L	2021-04-20	
UV Transmittance @ 254nm	71.5	0.10	% T	2021-04-17	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D1599
2021-04-21 13:46

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.

CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QCE

PROJECT INFO

WORK ORDER 21D2205

RECEIVED / TEMP 2021-04-21 13:56 / 8°C

REPORTED 2021-04-23 09:46

COC NUMBER B104532

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.

Work Order Comments:

Custody Seals Intact: YES

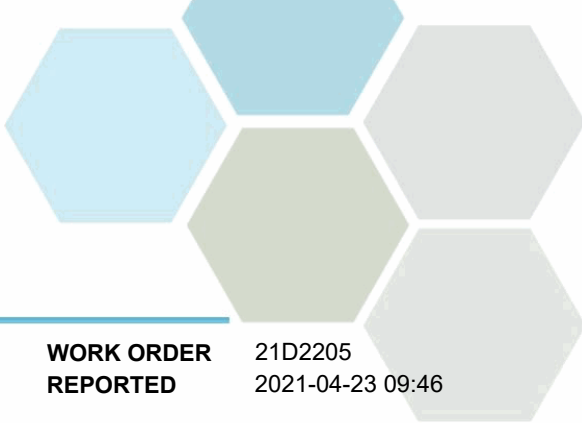
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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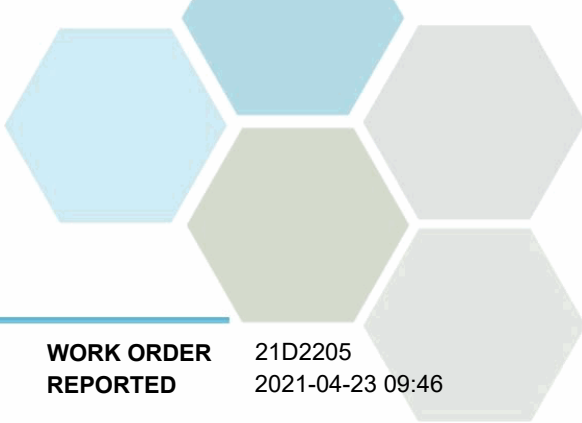


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21D2205
2021-04-23 09:46

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21D2205-01) Matrix: Water Sampled: 2021-04-20 11:30					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-04-21	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-04-21	
Field Blank - Effluent (21D2205-02) Matrix: Water Sampled: 2021-04-20 11:35					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-04-21	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-04-21	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21D2205
2021-04-23 09:46

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QCE

PROJECT INFO

WORK ORDER 21D2207

RECEIVED / TEMP 2021-04-21 12:40 / 8°C

REPORTED 2021-04-28 12:59

COC NUMBER B104532

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

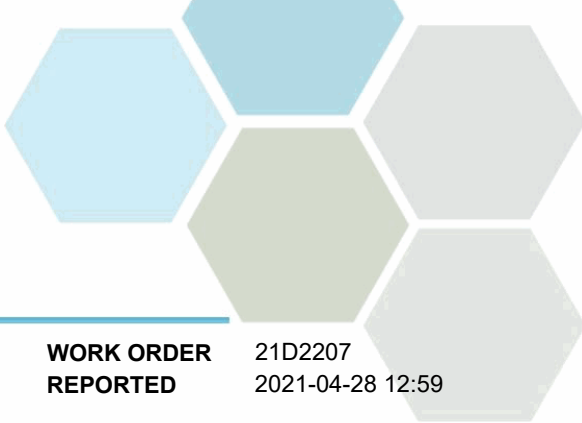
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21D2207
2021-04-28 12:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21D2207-01) Matrix: Water Sampled: 2021-04-20 11:30					FILT, PRES

Anions

Chloride	115	0.10	mg/L	2021-04-22	
Fluoride	0.17	0.10	mg/L	2021-04-22	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-22	
Phosphate (as P)	0.0068	0.0050	mg/L	2021-04-22	
Sulfate	47.9	1.0	mg/L	2021-04-22	

Calculated Parameters

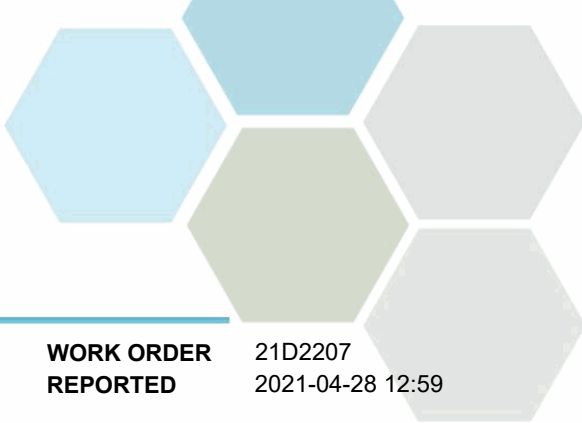
Hardness, Total (as CaCO3)	218	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	1.47	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	256	1.0	mg/L	2021-04-27	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Bicarbonate (as CaCO3)	256	1.0	mg/L	2021-04-27	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Ammonia, Total (as N)	0.100	0.050	mg/L	2021-04-22	
BOD, 5-day	2.0	2.0	mg/L	2021-04-27	
BOD, 5-day Carbonaceous	1.5	2.0	mg/L	2021-04-27	
Chemical Oxygen Demand	27	20	mg/L	2021-04-22	
Conductivity (EC)	935	2.0	µS/cm	2021-04-27	
Nitrogen, Total Kjeldahl	1.47	0.050	mg/L	2021-04-26	
pH	7.71	0.10	pH units	2021-04-27	HT2
Phosphorus, Total (as P)	0.120	0.0050	mg/L	2021-04-26	
Phosphorus, Total Dissolved	0.0659	0.0050	mg/L	2021-04-26	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-04-25	
UV Transmittance @ 254nm	68.5	0.10	% T	2021-04-23	

Total Metals

Aluminum, total	0.0475	0.0050	mg/L	2021-04-24	
Antimony, total	< 0.00020	0.00020	mg/L	2021-04-24	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-04-24	
Barium, total	0.0456	0.0050	mg/L	2021-04-24	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Bismuth, total	0.00012	0.00010	mg/L	2021-04-24	
Boron, total	0.158	0.0500	mg/L	2021-04-24	
Cadmium, total	0.000011	0.000010	mg/L	2021-04-24	
Calcium, total	65.1	0.20	mg/L	2021-04-24	
Chromium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Cobalt, total	0.00016	0.00010	mg/L	2021-04-24	
Copper, total	0.00379	0.00040	mg/L	2021-04-24	
Iron, total	0.053	0.010	mg/L	2021-04-24	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21D2207
2021-04-28 12:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21D2207-01) Matrix: Water Sampled: 2021-04-20 11:30, Continued					FILT, PRES

Total Metals, Continued

Lead, total	0.00032	0.00020	mg/L	2021-04-24	
Lithium, total	0.00691	0.00010	mg/L	2021-04-24	
Magnesium, total	13.6	0.010	mg/L	2021-04-24	
Manganese, total	0.0522	0.00020	mg/L	2021-04-24	
Mercury, total	< 0.000010	0.000010	mg/L	2021-04-24	
Molybdenum, total	0.00163	0.00010	mg/L	2021-04-24	
Nickel, total	0.00172	0.00040	mg/L	2021-04-24	
Phosphorus, total	0.112	0.050	mg/L	2021-04-24	
Potassium, total	17.8	0.10	mg/L	2021-04-24	
Selenium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Silicon, total	9.8	1.0	mg/L	2021-04-24	
Silver, total	< 0.000050	0.000050	mg/L	2021-04-24	
Sodium, total	95.4	0.10	mg/L	2021-04-24	
Strontium, total	0.572	0.0010	mg/L	2021-04-24	
Sulfur, total	18.4	3.0	mg/L	2021-04-24	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Thallium, total	0.000055	0.000020	mg/L	2021-04-24	
Thorium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Tin, total	0.00033	0.00020	mg/L	2021-04-24	
Titanium, total	< 0.0050	0.0050	mg/L	2021-04-24	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-04-24	
Uranium, total	0.00276	0.000020	mg/L	2021-04-24	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-04-24	
Zinc, total	0.0194	0.0040	mg/L	2021-04-24	
Zirconium, total	0.00011	0.00010	mg/L	2021-04-24	

Field Blank - Effluent (21D2207-02) | Matrix: Water | Sampled: 2021-04-20 11:35

FILT, PRES

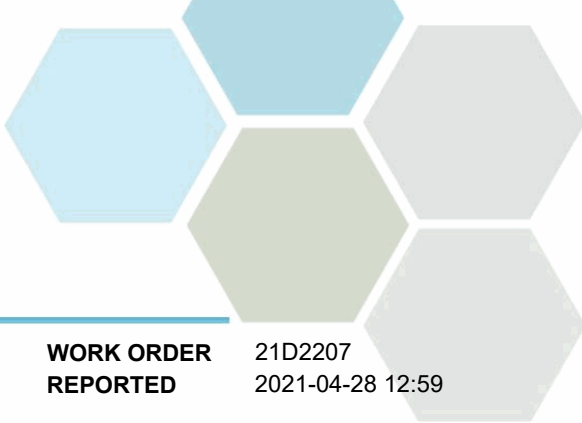
Anions

Chloride	< 0.10	0.10	mg/L	2021-04-22	
Fluoride	< 0.10	0.10	mg/L	2021-04-22	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-22	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-22	
Sulfate	< 1.0	1.0	mg/L	2021-04-22	

Calculated Parameters

Hardness, Total (as CaCO3)	< 0.500	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	

General Parameters



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21D2207
2021-04-28 12:59

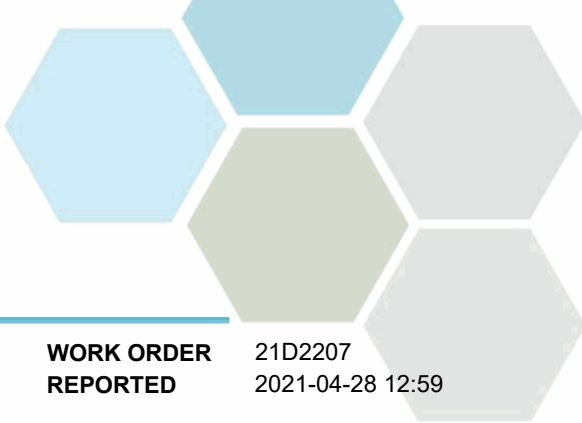
Analyte	Result	RL	Units	Analyzed	Qualifier
Field Blank - Effluent (21D2207-02) Matrix: Water Sampled: 2021-04-20 11:35, Continued					FILT, PRES

General Parameters, Continued

Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-04-22	
BOD, 5-day	< 1.3	2.0	mg/L	2021-04-27	
BOD, 5-day Carbonaceous	< 1.3	2.0	mg/L	2021-04-27	
Chemical Oxygen Demand	< 20	20	mg/L	2021-04-22	
Conductivity (EC)	< 2.0	2.0	µS/cm	2021-04-27	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-04-26	
pH	5.50	0.10	pH units	2021-04-27	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-04-26	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-04-26	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-04-25	
UV Transmittance @ 254nm	100	0.10	% T	2021-04-23	

Total Metals

Aluminum, total	< 0.0050	0.0050	mg/L	2021-04-24	
Antimony, total	< 0.00020	0.00020	mg/L	2021-04-24	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-04-24	
Barium, total	< 0.0050	0.0050	mg/L	2021-04-24	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-04-24	
Boron, total	< 0.0500	0.0500	mg/L	2021-04-24	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-04-24	
Calcium, total	< 0.20	0.20	mg/L	2021-04-24	
Chromium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-04-24	
Copper, total	0.00055	0.00040	mg/L	2021-04-24	
Iron, total	< 0.010	0.010	mg/L	2021-04-24	
Lead, total	< 0.00020	0.00020	mg/L	2021-04-24	
Lithium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Magnesium, total	< 0.010	0.010	mg/L	2021-04-24	
Manganese, total	< 0.00020	0.00020	mg/L	2021-04-24	
Mercury, total	< 0.000010	0.000010	mg/L	2021-04-24	
Molybdenum, total	< 0.00010	0.00010	mg/L	2021-04-24	
Nickel, total	< 0.00040	0.00040	mg/L	2021-04-24	
Phosphorus, total	< 0.050	0.050	mg/L	2021-04-24	
Potassium, total	< 0.10	0.10	mg/L	2021-04-24	
Selenium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Silicon, total	< 1.0	1.0	mg/L	2021-04-24	
Silver, total	< 0.000050	0.000050	mg/L	2021-04-24	



TEST RESULTS

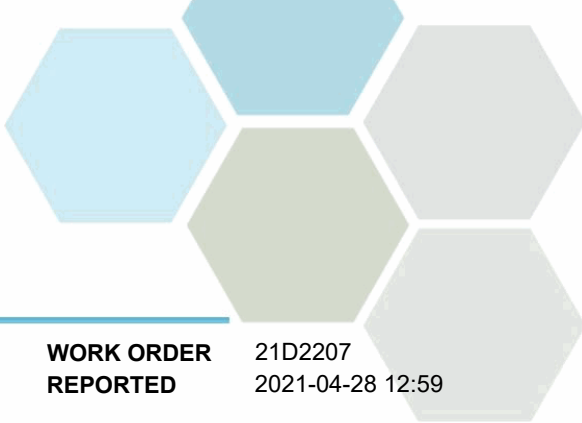
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21D2207
2021-04-28 12:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Field Blank - Effluent (21D2207-02) Matrix: Water Sampled: 2021-04-20 11:35, Continued					FILT, PRES
<i>Total Metals, Continued</i>					
Sodium, total	< 0.10	0.10	mg/L	2021-04-24	
Strontium, total	< 0.0010	0.0010	mg/L	2021-04-24	
Sulfur, total	< 3.0	3.0	mg/L	2021-04-24	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Thallium, total	< 0.000020	0.000020	mg/L	2021-04-24	
Thorium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Tin, total	< 0.00020	0.00020	mg/L	2021-04-24	
Titanium, total	< 0.0050	0.0050	mg/L	2021-04-24	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-04-24	
Uranium, total	< 0.000020	0.000020	mg/L	2021-04-24	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-04-24	
Zinc, total	< 0.0040	0.0040	mg/L	2021-04-24	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-04-24	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

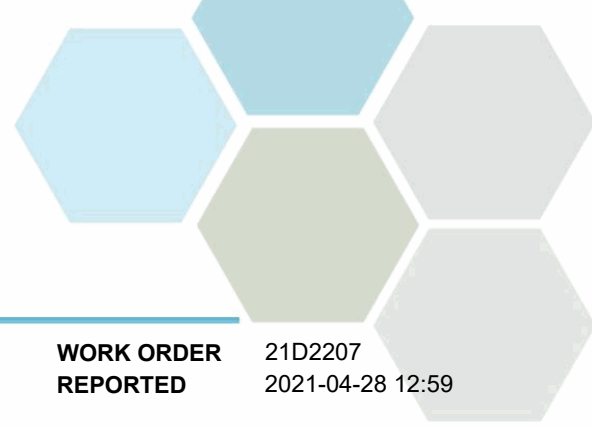
WORK ORDER REPORTED 21D2207
2021-04-28 12:59

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21D2207
2021-04-28 12:59

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21D3229
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-04-29 13:20 / 3°C 2021-05-04 14:56
PO NUMBER	OK Falls WW	COC NUMBER	B104533
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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Work Order Comments:

Custody Seals Intact: YES

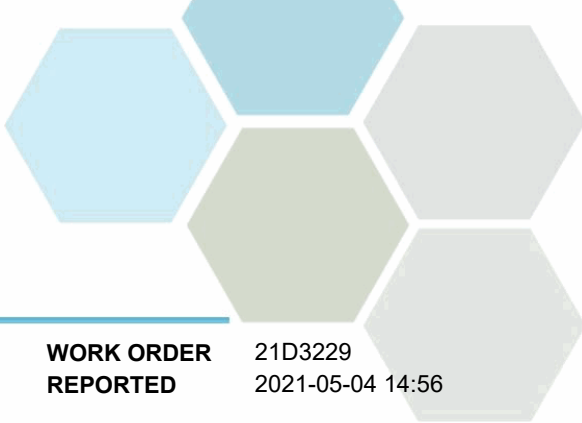
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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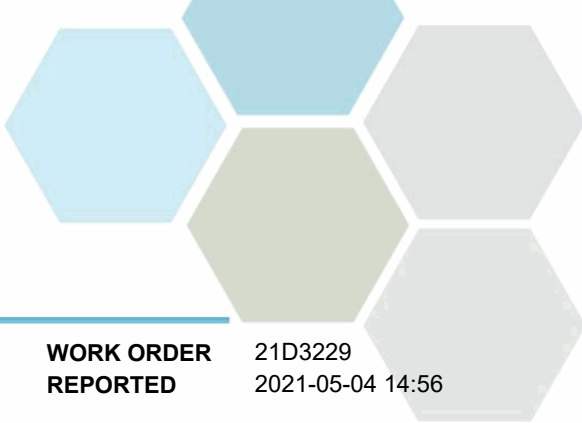


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D3229
2021-05-04 14:56

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21D3229-01) Matrix: Water Sampled: 2021-04-28 12:35					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-04-29	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-04-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D3229
2021-05-04 14:56

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21D3230
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-04-29 13:20 / 3°C
PO NUMBER	OK Falls WW	REPORTED	2021-05-06 11:56
PROJECT	OK Falls WWTP WAE	COC NUMBER	B104533
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

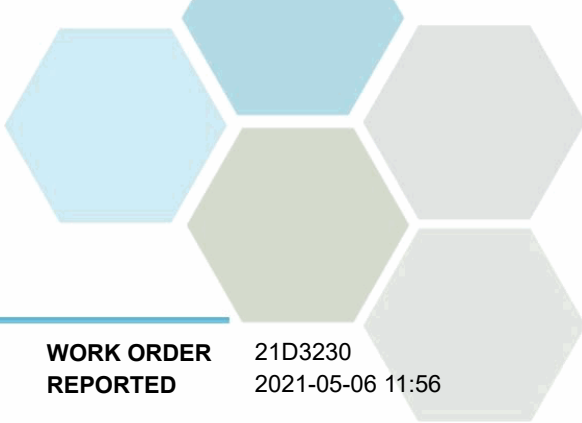
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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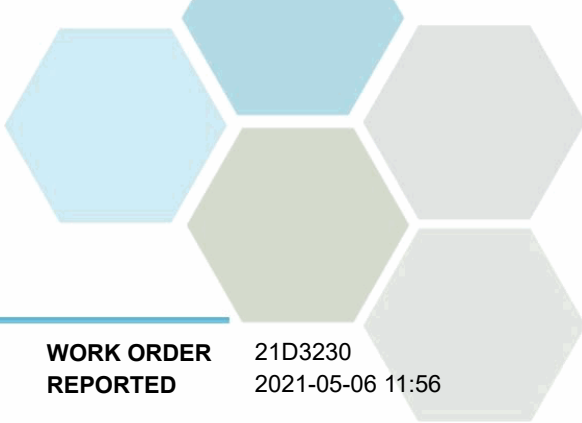


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D3230
2021-05-06 11:56

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21D3230-01) Matrix: Fresh Water Sampled: 2021-04-28 12:35					
<i>Anions</i>					
Nitrate (as N)	0.113	0.010	mg/L	2021-04-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-30	
Phosphate (as P)	0.0066	0.0050	mg/L	2021-04-30	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.122	0.050	mg/L	2021-04-30	
Chemical Oxygen Demand	35	20	mg/L	2021-05-05	
Phosphorus, Total (as P)	0.121	0.0050	mg/L	2021-05-03	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-05-05	
UV Transmittance @ 254nm	69.1	0.10	% T	2021-04-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21D3230
2021-05-06 11:56

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21E0635

RECEIVED / TEMP 2021-05-06 10:50 / 7°C

REPORTED 2021-05-10 11:01

COC NUMBER B104534

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

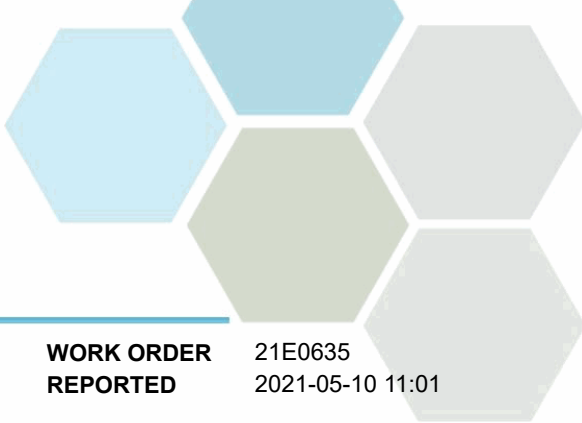
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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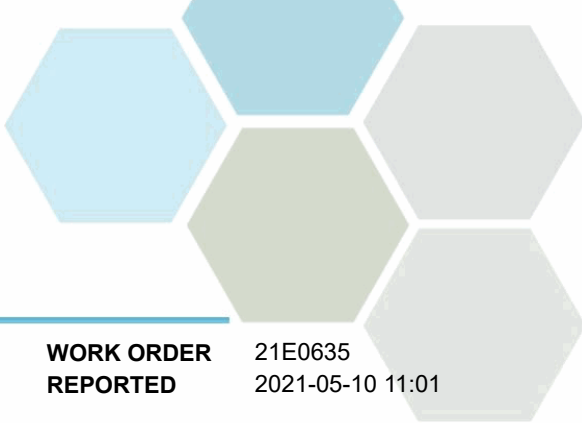


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E0635
2021-05-10 11:01

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21E0635-01) Matrix: Water Sampled: 2021-05-05 13:03					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-05-06	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-05-06	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E0635
2021-05-10 11:01

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
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SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21E0636

RECEIVED / TEMP 2021-05-06 10:50 / 7°C

REPORTED 2021-05-12 16:08

COC NUMBER B104534

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

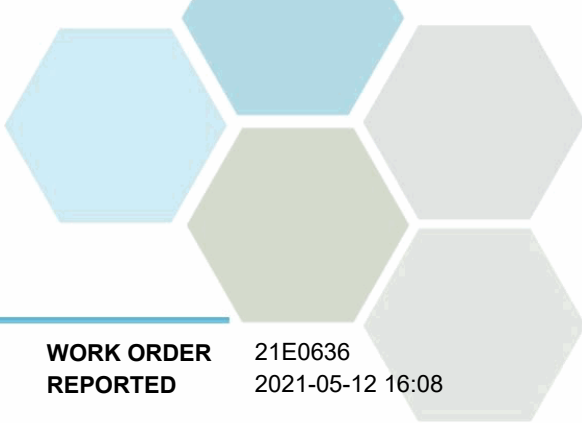
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

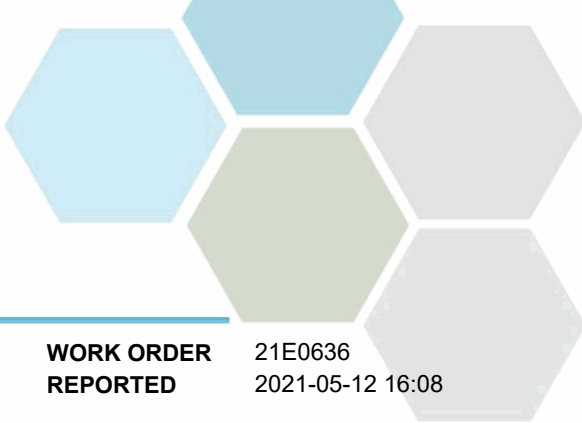
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E0636
2021-05-12 16:08

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21E0636-01) Matrix: Fresh Water Sampled: 2021-05-05 13:03					
Anions					
Nitrate (as N)	0.020	0.010	mg/L	2021-05-08	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-08	
Phosphate (as P)	0.0144	0.0050	mg/L	2021-05-08	
General Parameters					
Ammonia, Total (as N)	0.166	0.050	mg/L	2021-05-11	
Chemical Oxygen Demand	43	20	mg/L	2021-05-12	
Phosphorus, Total (as P)	0.145	0.0050	mg/L	2021-05-11	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-05-11	
UV Transmittance @ 254nm	67.9	0.10	% T	2021-05-12	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E0636
2021-05-12 16:08

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21E1322

RECEIVED / TEMP 2021-05-12 15:30 / 5°C

REPORTED 2021-05-14 16:25

COC NUMBER B099123

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

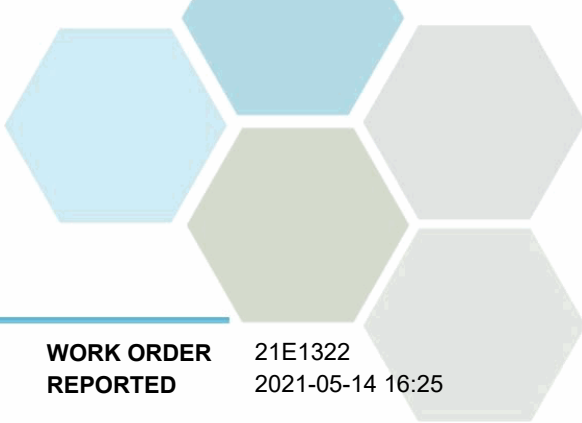
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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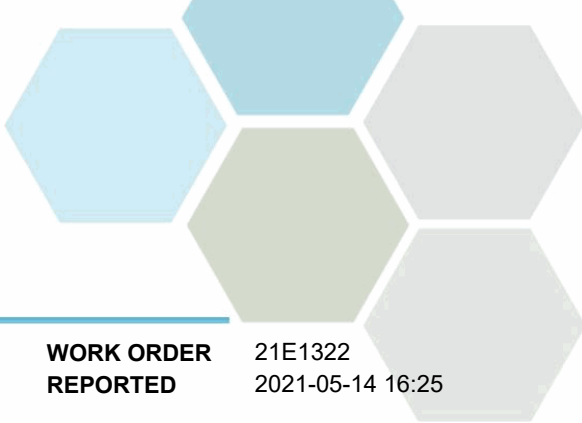


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E1322
2021-05-14 16:25

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21E1322-01) Matrix: Water Sampled: 2021-05-11 11:52					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-05-12	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-05-12	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E1322
2021-05-14 16:25

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E1323
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-12 15:30 / 5°C
PO NUMBER	OK Falls WW	COC NUMBER	B099123
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

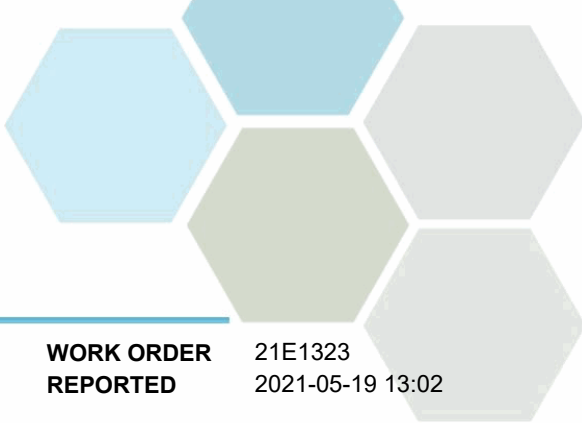
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

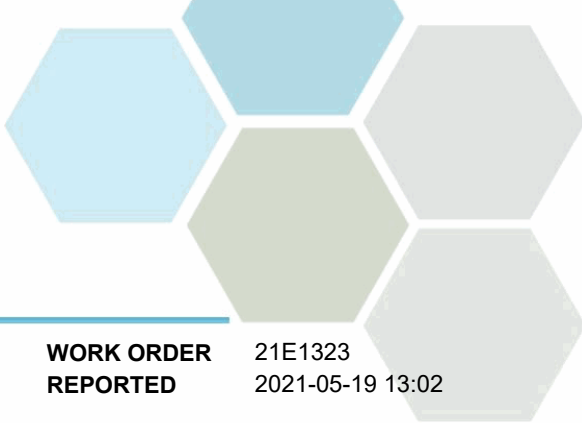
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E1323
2021-05-19 13:02

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21E1323-01) Matrix: Fresh Water Sampled: 2021-05-11 11:52					
Anions					
Nitrate (as N)	0.021	0.010	mg/L	2021-05-14	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-14	
Phosphate (as P)	0.0252	0.0050	mg/L	2021-05-14	
General Parameters					
Ammonia, Total (as N)	0.216	0.050	mg/L	2021-05-17	
Chemical Oxygen Demand	34	20	mg/L	2021-05-19	
Phosphorus, Total (as P)	0.167	0.0050	mg/L	2021-05-18	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-05-19	HT1
UV Transmittance @ 254nm	66.2	0.10	% T	2021-05-17	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E1323
2021-05-19 13:02

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E2187
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-19 12:40 / 7.0°C
PO NUMBER	OK Falls WW	REPORTED	2021-05-21 10:06
PROJECT	OK Falls WWTP MCE	COC NUMBER	B099124
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

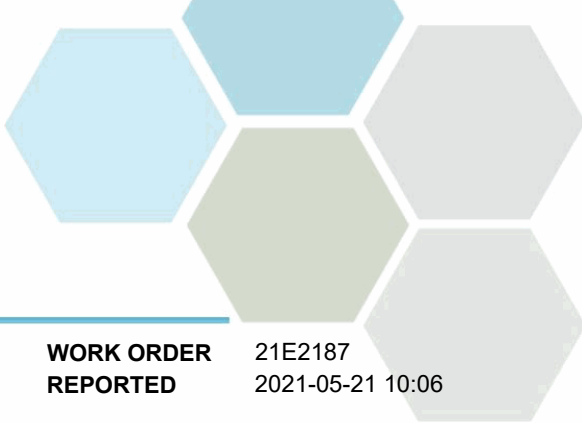
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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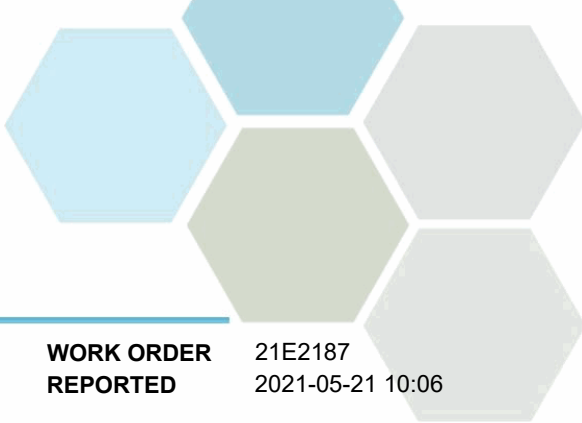


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21E2187
2021-05-21 10:06

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE Bacterial (21E2187-01) Matrix: Water Sampled: 2021-05-18 11:20					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-05-19	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-05-19	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21E2187
2021-05-21 10:06

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E2192
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-19 12:40 / 7.0°C
PO NUMBER	OK Falls WW	COC NUMBER	B099124
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

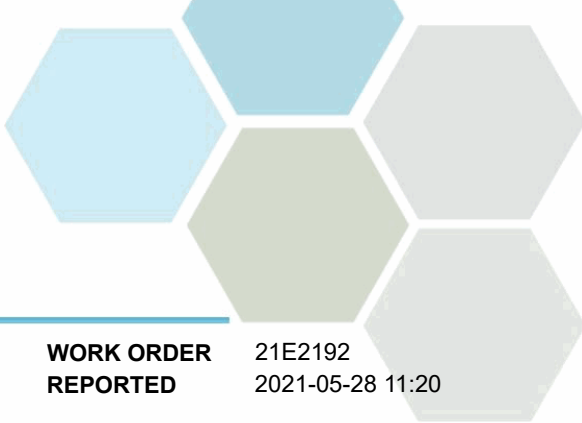
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21E2192
2021-05-28 11:20

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE (21E2192-01) Matrix: Water Sampled: 2021-05-18					FILT, PRES
Anions					
Nitrate (as N)	0.031	0.010	mg/L	2021-05-21	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-21	
Phosphate (as P)	0.0135	0.0050	mg/L	2021-05-21	
Calculated Parameters					
Nitrate+Nitrite (as N)	0.0309	0.0100	mg/L	N/A	
Nitrogen, Total	1.64	0.0500	mg/L	N/A	
Nitrogen, Organic	1.36	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	0.255	0.050	mg/L	2021-05-25	
BOD, 5-day	2.5	2.0	mg/L	2021-05-26	
BOD, 5-day Carbonaceous	2.0	2.0	mg/L	2021-05-26	
Chemical Oxygen Demand	33	20	mg/L	2021-05-27	
Nitrogen, Total Kjeldahl	1.61	0.050	mg/L	2021-05-27	
pH	7.10	0.10	pH units	2021-05-25	HT2
Phosphorus, Total (as P)	0.134	0.0050	mg/L	2021-05-25	
Phosphorus, Total Dissolved	0.0886	0.0050	mg/L	2021-05-25	
Solids, Total Suspended	3.1	2.0	mg/L	2021-05-25	
UV Transmittance @ 254nm	66.7	0.10	% T	2021-05-26	HT1

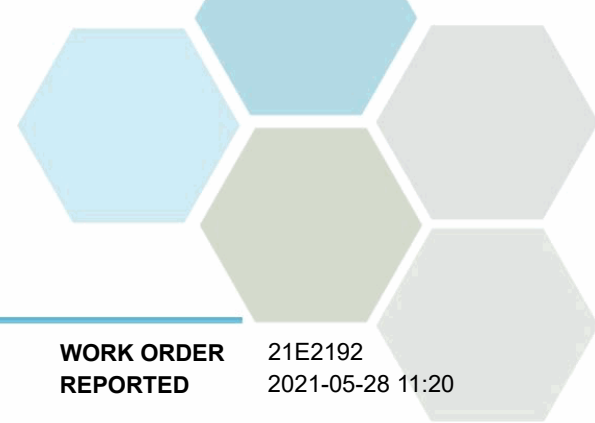
Sample Qualifiers:

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.

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.

PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

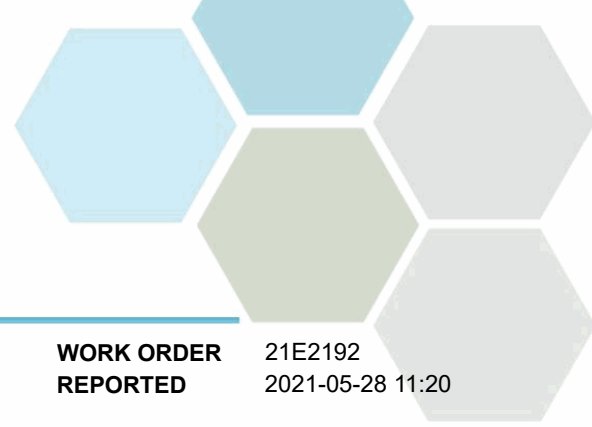
WORK ORDER REPORTED 21E2192
2021-05-28 11:20

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21E2192
2021-05-28 11:20

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E3064
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-27 12:40 / 8.4°C
PO NUMBER	OK Falls WW	REPORTED	2021-05-31 11:10
PROJECT	OK Falls WWTP WAE	COC NUMBER	B099127
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

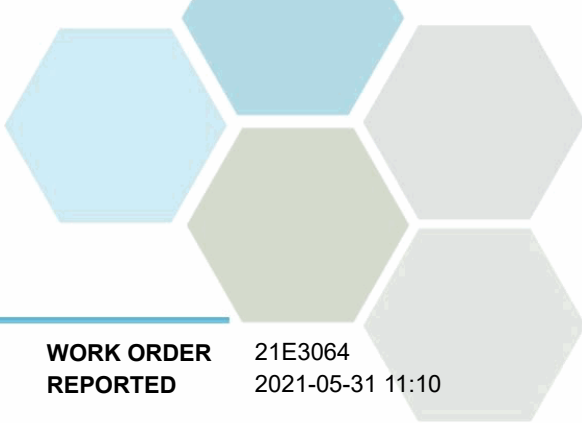
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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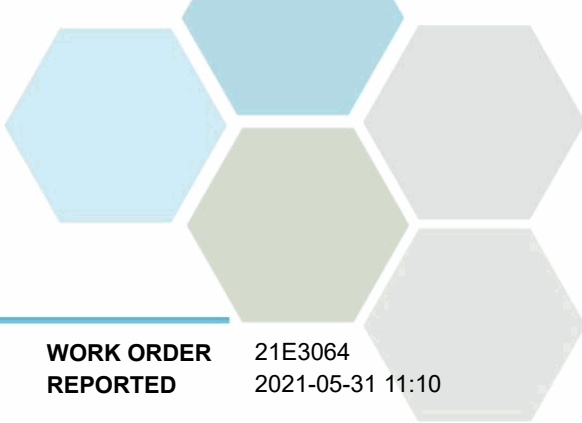


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E3064
2021-05-31 11:10

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21E3064-01) Matrix: Water Sampled: 2021-05-26 10:22					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-05-27	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-05-27	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E3064
2021-05-31 11:10

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E3065
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-27 12:40 / 8.4°C
PO NUMBER	OK Falls WW	REPORTED	2021-06-03 10:55
PROJECT	OK Falls WWTP WAE	COC NUMBER	B099127
PROJECT INFO			

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Ahead of the Curve



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Work Order Comments:

Custody Seals Intact: YES

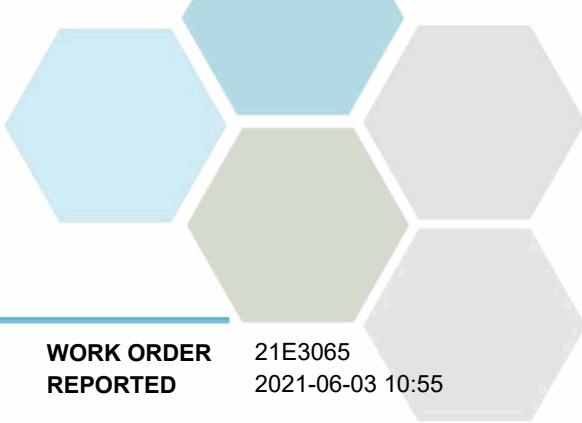
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

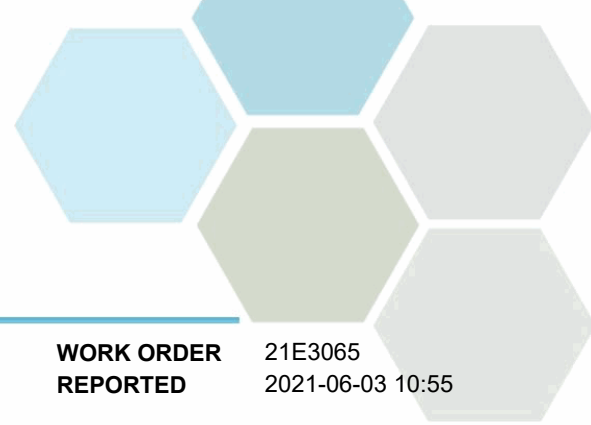
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E3065
2021-06-03 10:55

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21E3065-01) Matrix: Fresh Water Sampled: 2021-05-26 10:22					
Anions					
Nitrate (as N)	0.132	0.010	mg/L	2021-05-28	
Nitrite (as N)	0.138	0.010	mg/L	2021-05-28	
Phosphate (as P)	0.0166	0.0050	mg/L	2021-05-28	
General Parameters					
Ammonia, Total (as N)	0.265	0.050	mg/L	2021-05-28	
Chemical Oxygen Demand	29	20	mg/L	2021-06-02	
Phosphorus, Total (as P)	0.119	0.0050	mg/L	2021-06-01	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-03	HT1
UV Transmittance @ 254nm	64.7	0.10	% T	2021-05-28	

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21E3065
2021-06-03 10:55

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F0503
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-03 09:50 / 8.3°C
PO NUMBER	OK Falls WW	REPORTED	2021-06-04 15:47
PROJECT	OK Falls WWTP WAE	COC NUMBER	B099113
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

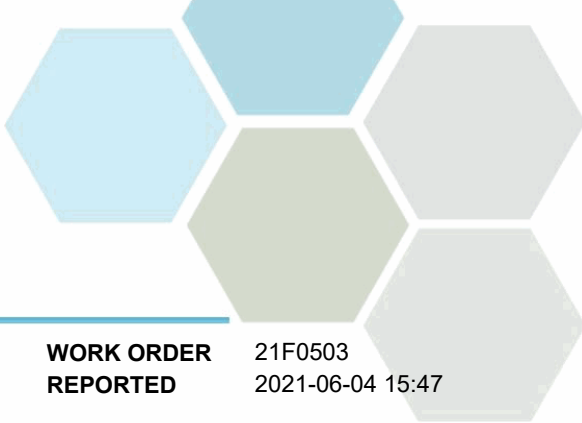
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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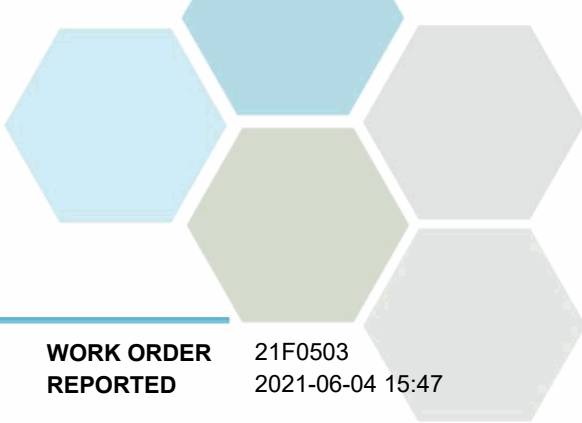


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F0503
2021-06-04 15:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21F0503-01) Matrix: Water Sampled: 2021-06-02 10:23					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-06-03	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-06-03	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F0503
2021-06-04 15:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F0508
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-03 09:50 / 8.3°C 2021-06-09 13:26
PO NUMBER	OK Falls WW	COC NUMBER	B099113
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

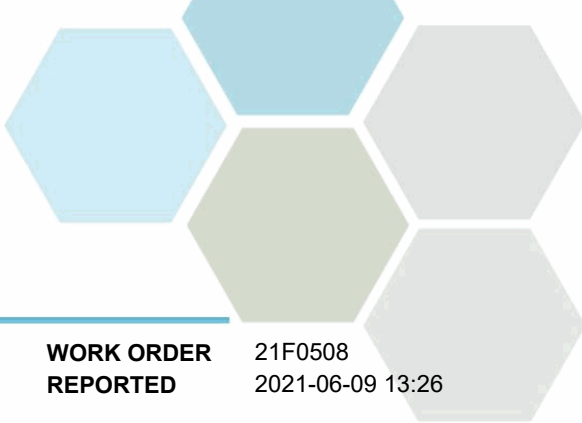
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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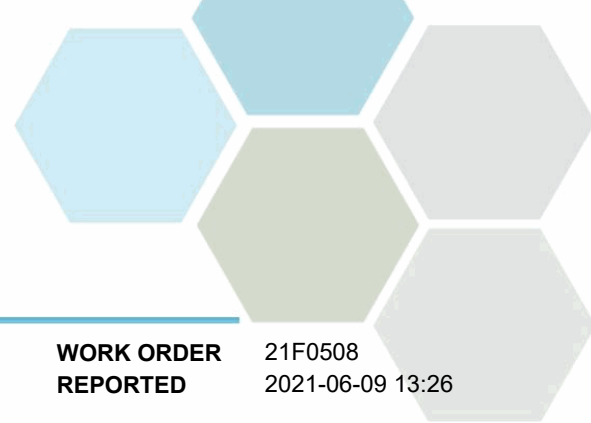


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F0508
2021-06-09 13:26

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21F0508-01) Matrix: Fresh Water Sampled: 2021-06-02 10:23					
<i>Anions</i>					
Nitrate (as N)	0.278	0.010	mg/L	2021-06-03	
Nitrite (as N)	0.071	0.010	mg/L	2021-06-03	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-06-03	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.301	0.050	mg/L	2021-06-07	
Chemical Oxygen Demand	35	20	mg/L	2021-06-08	
Phosphorus, Total (as P)	0.117	0.0050	mg/L	2021-06-08	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-08	
UV Transmittance @ 254nm	67.2	0.10	% T	2021-06-04	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F0508
2021-06-09 13:26

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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mg/L	Milligrams per litre
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F1462
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-10 13:20 / 3.8°C 2021-06-14 14:20
PO NUMBER	OK Falls WW	COC NUMBER	B099128
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

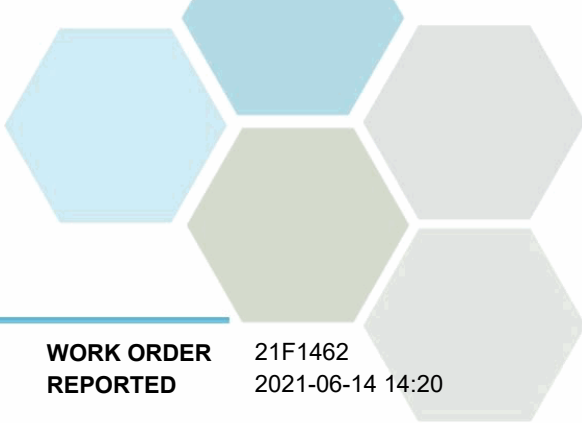
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

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Client Scientist - Team Lead

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TEST RESULTS

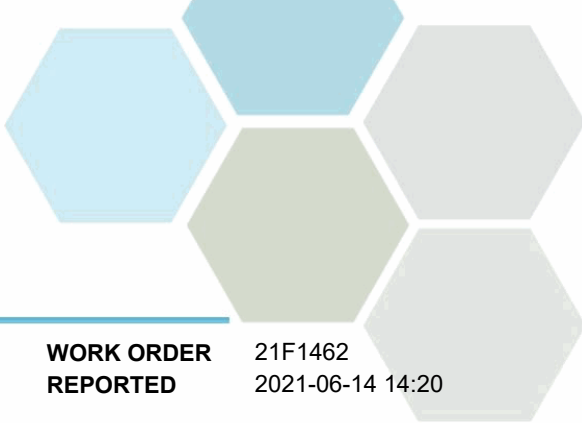
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F1462
2021-06-14 14:20

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21F1462-01) Matrix: Water Sampled: 2021-06-09 10:20					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-06-10	HT1
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-06-10	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F1462
2021-06-14 14:20

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F1469
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-10 13:20 / 3.8°C 2021-06-17 15:45
PO NUMBER	OK Falls WW	COC NUMBER	B099128
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

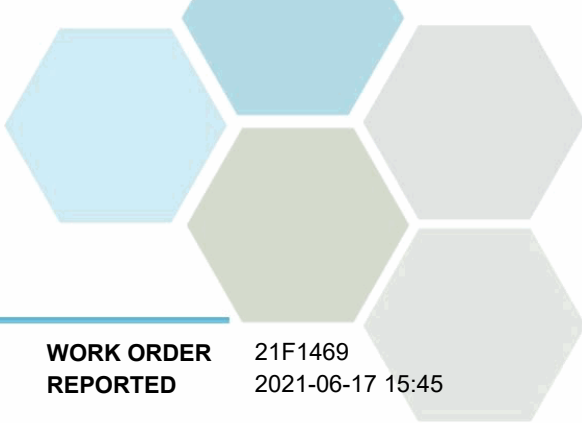
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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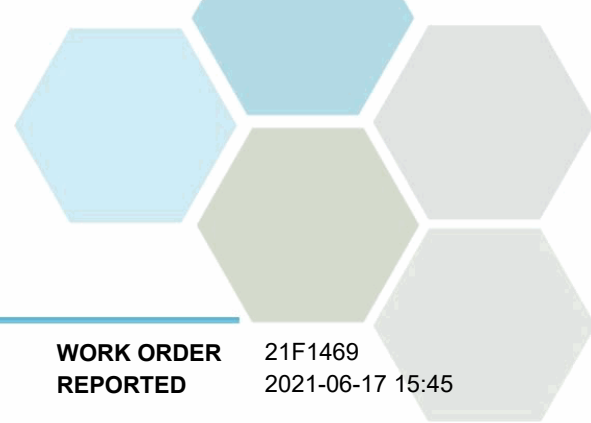


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F1469
2021-06-17 15:45

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21F1469-01) Matrix: Fresh Water Sampled: 2021-06-09 10:20					
<i>Anions</i>					
Nitrate (as N)	0.982	0.010	mg/L	2021-06-12	
Nitrite (as N)	0.133	0.010	mg/L	2021-06-12	
Phosphate (as P)	0.0050	0.0050	mg/L	2021-06-12	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.185	0.050	mg/L	2021-06-14	
Chemical Oxygen Demand	33	20	mg/L	2021-06-16	
Phosphorus, Total (as P)	0.111	0.0050	mg/L	2021-06-16	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-15	
UV Transmittance @ 254nm	69.7	0.10	% T	2021-06-11	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F1469
2021-06-17 15:45

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F2424
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-17 12:10 / 5.4°C
PO NUMBER	OK Falls WW	COC NUMBER	B099114
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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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.

Work Order Comments:

Custody Seals Intact: YES

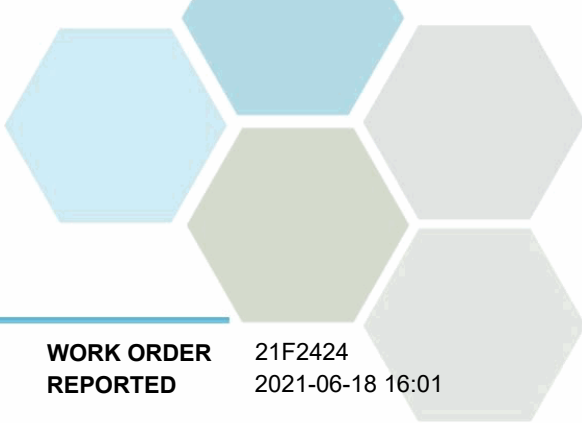
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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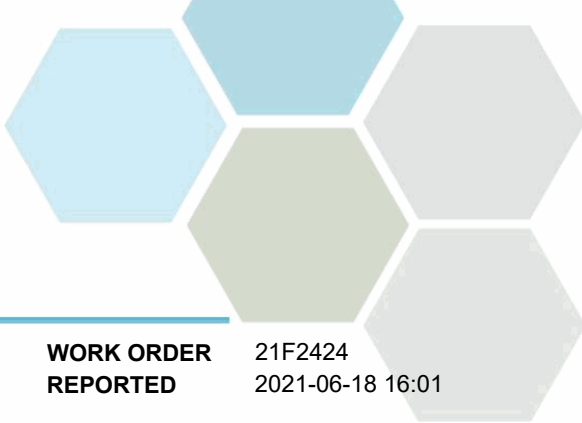


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21F2424
2021-06-18 16:01

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE Bacterial (21F2424-01) Matrix: Water Sampled: 2021-06-16 10:18					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-06-17	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-06-17	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21F2424
2021-06-18 16:01

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCE

PROJECT INFO

WORK ORDER 21F2434

RECEIVED / TEMP 2021-06-17 12:10 / 5.4°C

REPORTED 2021-06-24 11:45

COC NUMBER B099114

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

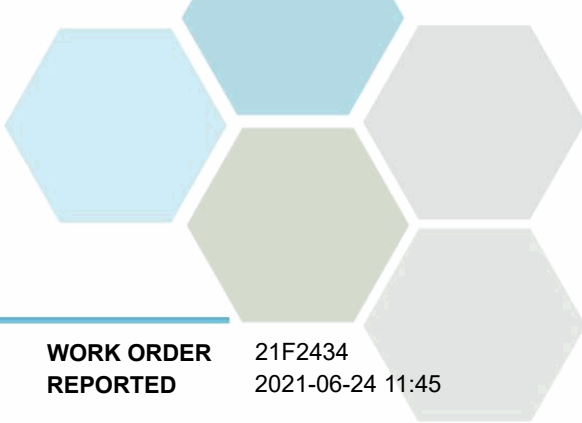
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Authorized By:

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TEST RESULTS

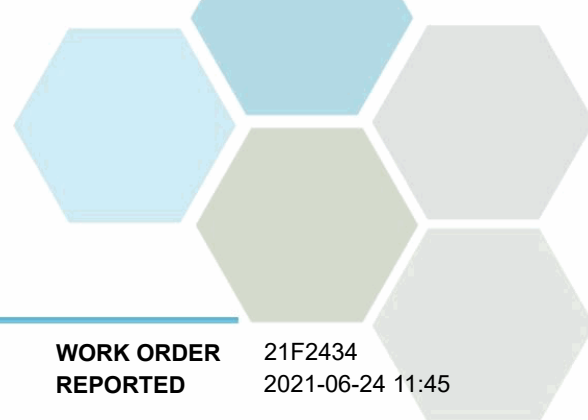
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21F2434
2021-06-24 11:45

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE (21F2434-01) Matrix: Water Sampled: 2021-06-16 10:18					FILT, PRES
Anions					
Nitrate (as N)	1.78	0.010	mg/L	2021-06-19	
Nitrite (as N)	0.130	0.010	mg/L	2021-06-19	
Phosphate (as P)	0.0585	0.0050	mg/L	2021-06-19	
Calculated Parameters					
Nitrate+Nitrite (as N)	1.91	0.0100	mg/L	N/A	
Nitrogen, Total	3.30	0.0500	mg/L	N/A	
Nitrogen, Organic	1.23	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	0.156	0.050	mg/L	2021-06-18	
BOD, 5-day	2.4	2.0	mg/L	2021-06-23	
Chemical Oxygen Demand	20	20	mg/L	2021-06-22	
Nitrogen, Total Kjeldahl	1.38	0.050	mg/L	2021-06-23	
pH	7.97	0.10	pH units	2021-06-23	HT2
Phosphorus, Total (as P)	0.124	0.0050	mg/L	2021-06-23	
Phosphorus, Total Dissolved	0.0940	0.0050	mg/L	2021-06-23	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-20	
UV Transmittance @ 254nm	67.8	0.10	% T	2021-06-18	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21F2434
2021-06-24 11:45

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F3138
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-23 08:00 / 3.1°C
PO NUMBER	OK Falls WW	COC NUMBER	B099116
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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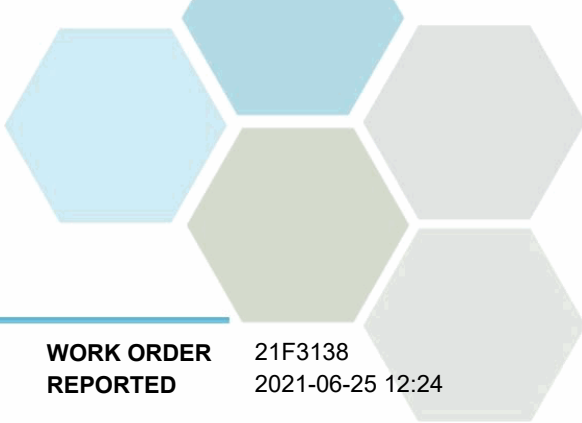
<p><i>Big Picture Sidekicks</i></p>  <p>You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.</p>	<p><i>We've Got Chemistry</i></p>  <p>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.</p>	<p><i>Ahead of the Curve</i></p>  <p>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.</p>
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Work Order Comments: Custody Seals Intact: YES

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

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

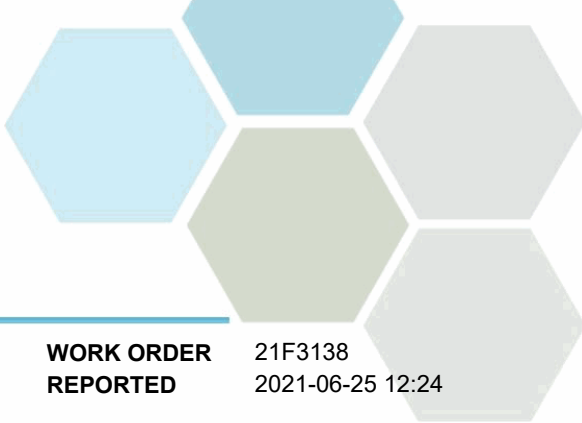


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F3138
2021-06-25 12:24

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21F3138-01) Matrix: Water Sampled: 2021-06-22 10:10					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-06-23	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-06-23	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F3138
2021-06-25 12:24

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F3140
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-23 08:00 / 3.1°C
PO NUMBER	OK Falls WW	COC NUMBER	B099116
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

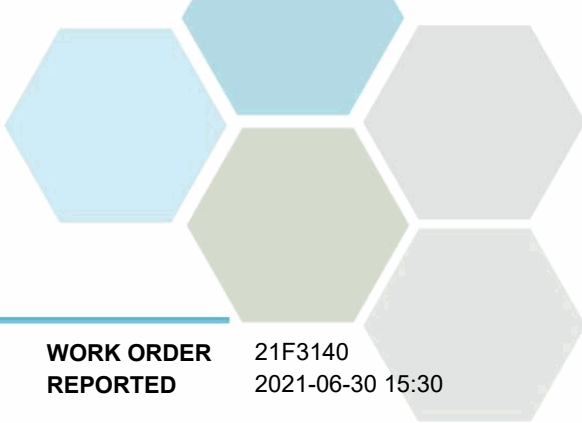
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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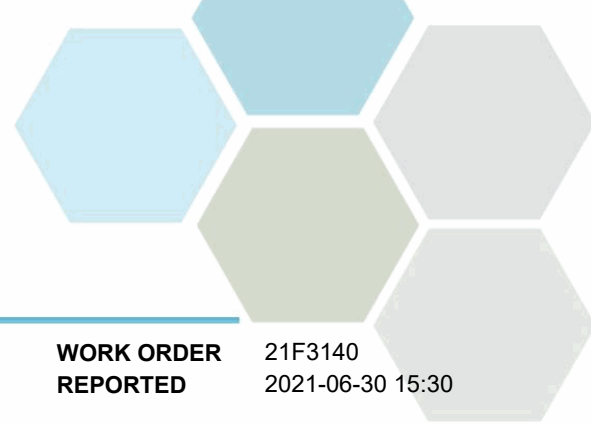


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F3140
2021-06-30 15:30

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21F3140-01) Matrix: Fresh Water Sampled: 2021-06-22 10:10					
<i>Anions</i>					
Nitrate (as N)	0.388	0.010	mg/L	2021-06-25	
Nitrite (as N)	0.111	0.010	mg/L	2021-06-25	
Phosphate (as P)	0.0200	0.0050	mg/L	2021-06-25	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.373	0.050	mg/L	2021-06-24	
Chemical Oxygen Demand	30	20	mg/L	2021-06-30	
Phosphorus, Total (as P)	0.151	0.0050	mg/L	2021-06-28	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-26	
UV Transmittance @ 254nm	72.6	0.10	% T	2021-06-25	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F3140
2021-06-30 15:30

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21F3804

RECEIVED / TEMP 2021-06-29 12:14 / 4.1°C

REPORTED 2021-06-30 15:25

COC NUMBER B099119

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

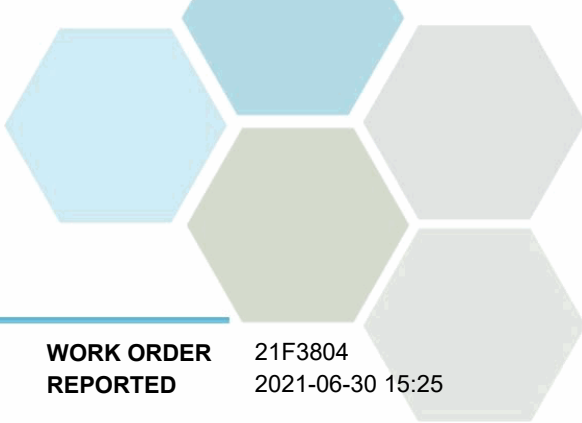
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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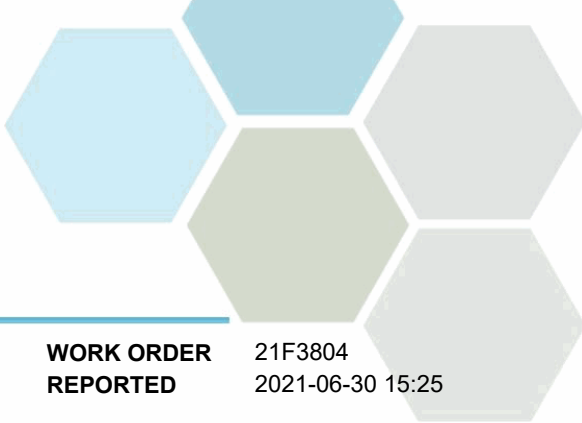


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F3804
2021-06-30 15:25

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21F3804-01) Matrix: Water Sampled: 2021-06-28 12:53					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-06-29	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-06-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F3804
2021-06-30 15:25

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F3816
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-29 12:14 / 4.1°C
PO NUMBER	OK Falls WW	REPORTED	2021-07-07 10:45
PROJECT	OK Falls WWTP WAE	COC NUMBER	B099119
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

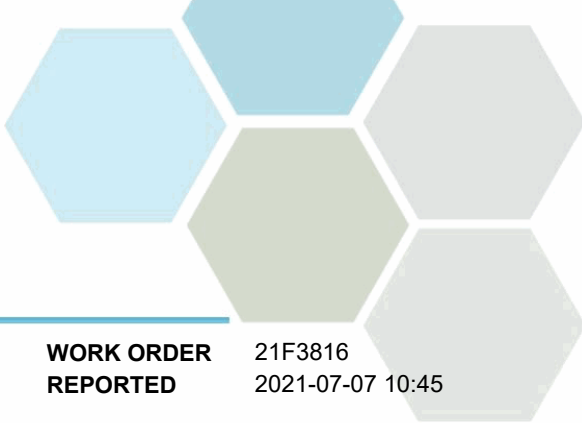
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

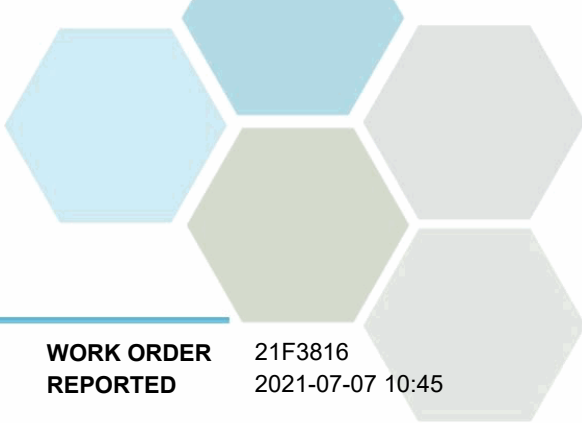
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F3816
2021-07-07 10:45

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21F3816-01) Matrix: Fresh Water Sampled: 2021-06-28					
Anions					
Nitrate (as N)	3.36	0.010	mg/L	2021-07-01	
Nitrite (as N)	0.040	0.010	mg/L	2021-07-01	
Phosphate (as P)	0.124	0.0050	mg/L	2021-07-01	
General Parameters					
Ammonia, Total (as N)	0.147	0.050	mg/L	2021-07-03	
Chemical Oxygen Demand	29	20	mg/L	2021-07-07	
Phosphorus, Total (as P)	0.155	0.0050	mg/L	2021-07-06	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-05	
UV Transmittance @ 254nm	73.4	0.10	% T	2021-07-05	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21F3816
2021-07-07 10:45

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G0675
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-07 09:50 / 9.5°C 2021-07-09 10:47
PO NUMBER	OK Falls WW	COC NUMBER	B099112
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

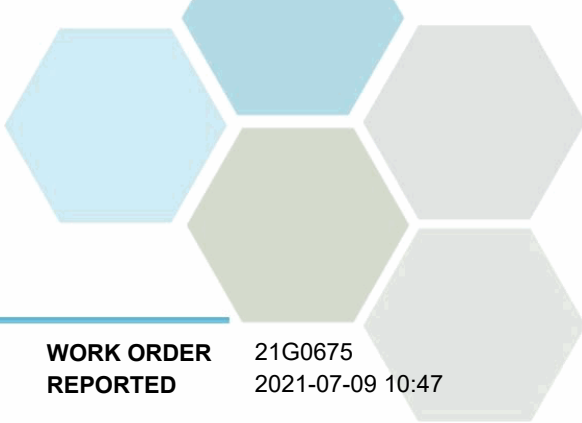
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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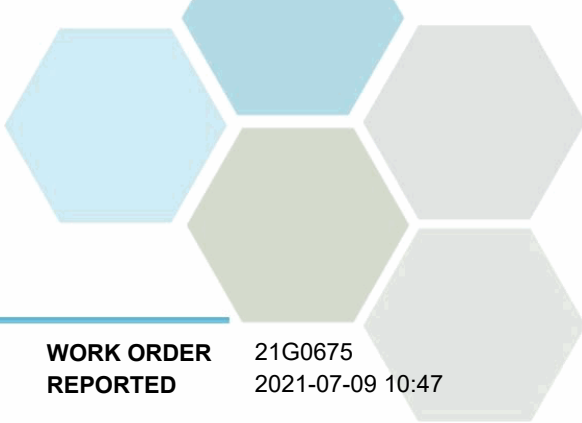


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G0675
2021-07-09 10:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21G0675-01) Matrix: Water Sampled: 2021-07-06 11:43					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-07-07	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-07-07	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G0675
2021-07-09 10:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G0676
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-07 09:50 / 9.5°C 2021-07-14 09:46
PO NUMBER	OK Falls WW	COC NUMBER	B099112
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

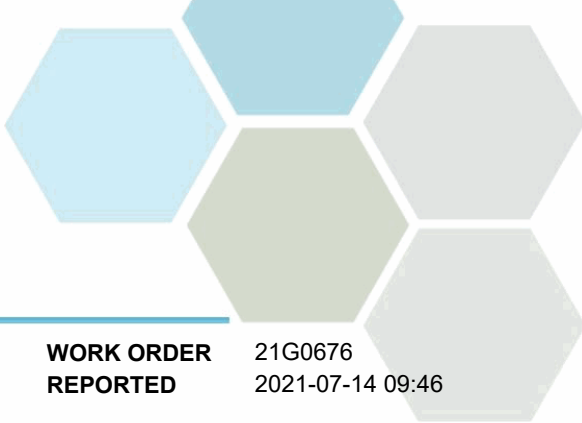
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

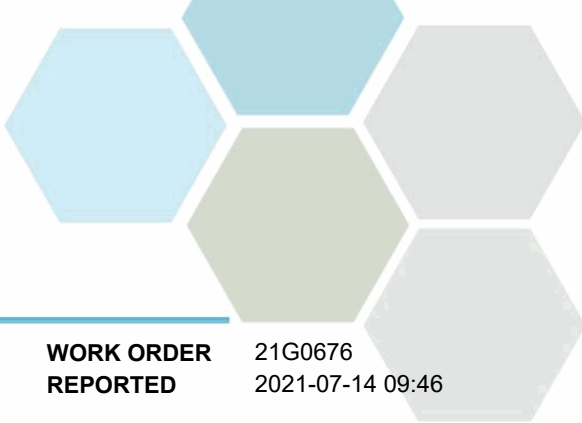
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G0676
2021-07-14 09:46

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G0676-01) Matrix: Fresh Water Sampled: 2021-07-06 11:43					PRES
Anions					
Nitrate (as N)	2.88	0.010	mg/L	2021-07-08	
Nitrite (as N)	0.062	0.010	mg/L	2021-07-08	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-07-08	
General Parameters					
Ammonia, Total (as N)	0.278	0.050	mg/L	2021-07-08	
Chemical Oxygen Demand	42	20	mg/L	2021-07-12	
Phosphorus, Total (as P)	0.0867	0.0050	mg/L	2021-07-13	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-13	
UV Transmittance @ 254nm	70.2	0.10	% T	2021-07-08	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G0676
2021-07-14 09:46

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G1380
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-13 12:05 / 8.6°C 2021-07-14 16:28
PO NUMBER	OK Falls WW	COC NUMBER	B099110
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

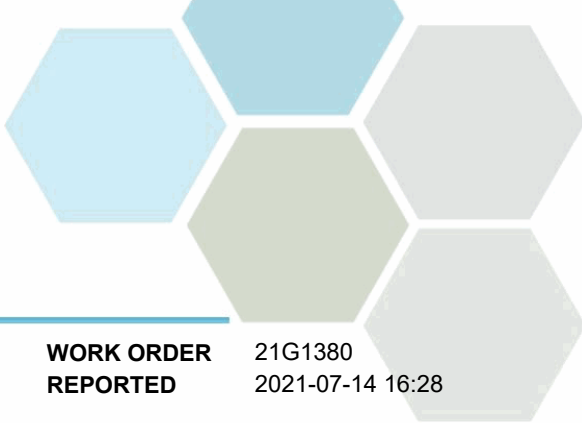
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Authorized By:

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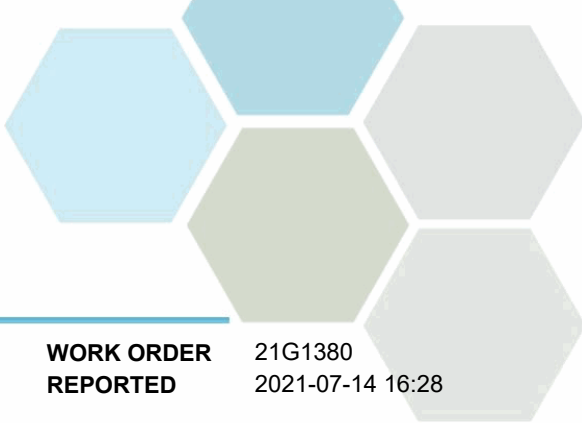


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G1380
2021-07-14 16:28

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21G1380-01) Matrix: Water Sampled: 2021-07-12 10:38					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-07-13	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-07-13	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G1380
2021-07-14 16:28

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G1386
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-13 12:05 / 8.6°C 2021-07-19 16:10
PO NUMBER	OK Falls WW	COC NUMBER	B099110
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

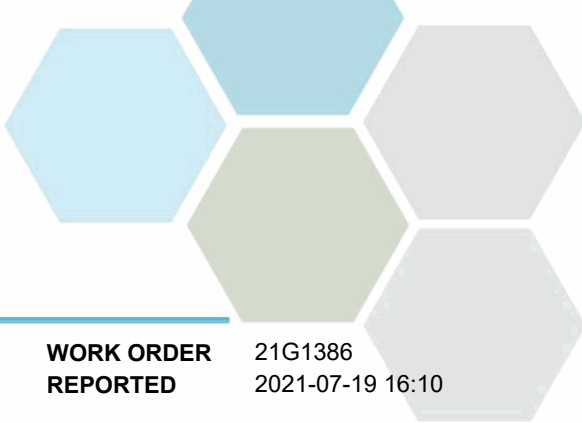
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

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TEST RESULTS

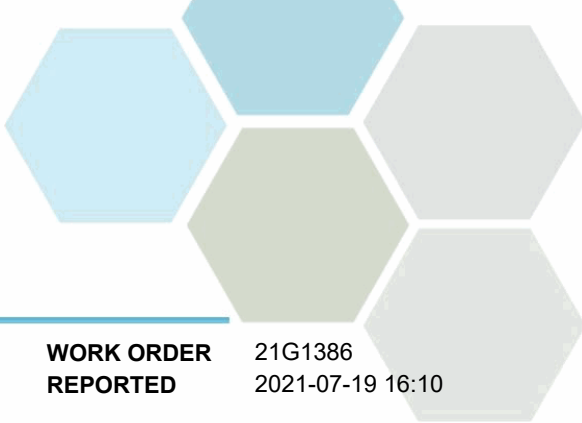
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G1386
2021-07-19 16:10

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G1386-01) Matrix: Fresh Water Sampled: 2021-07-12					PRES
Anions					
Nitrate (as N)	3.51	0.010	mg/L	2021-07-14	
Nitrite (as N)	0.052	0.010	mg/L	2021-07-14	
Phosphate (as P)	0.0323	0.0050	mg/L	2021-07-14	
General Parameters					
Ammonia, Total (as N)	0.232	0.050	mg/L	2021-07-14	
Chemical Oxygen Demand	15	20	mg/L	2021-07-19	
Phosphorus, Total (as P)	0.106	0.0050	mg/L	2021-07-16	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-16	
UV Transmittance @ 254nm	68.8	0.10	% T	2021-07-14	

Sample Qualifiers:

PRES Sample has been preserved for COD, NH3, TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G1386
2021-07-19 16:10

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2722
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-22 12:30 / 10.7°C 2021-07-23 13:33
PO NUMBER	OK Falls WW	COC NUMBER	B095371
PROJECT	OK Falls WWTP QCE		
PROJECT INFO			

Introduction:

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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.

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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.

Work Order Comments:

Custody Seals Intact: YES

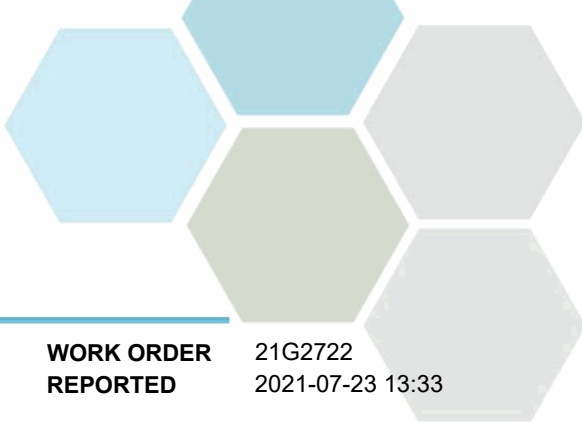
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

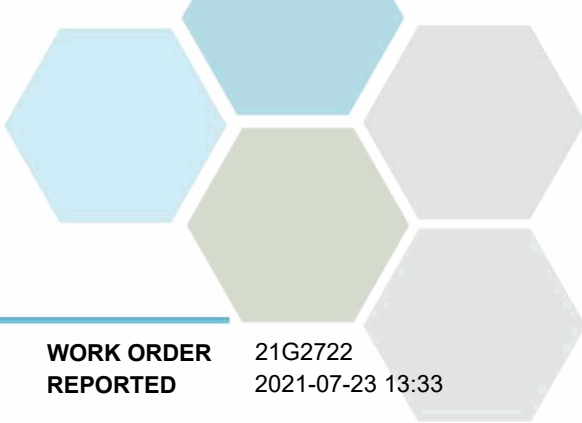


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2722
2021-07-23 13:33

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21G2722-01) Matrix: Water Sampled: 2021-07-21 10:10					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-07-22	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-07-22	
Rep 2 Effluent Grab - Bacteria (21G2722-02) Matrix: Water Sampled: 2021-07-21 10:10					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-07-22	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-07-22	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2722
2021-07-23 13:33

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2724
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-22 12:30 / 10.7°C
PO NUMBER	OK Falls WW	COC NUMBER	B095371
PROJECT	OK Falls WWTP QCE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

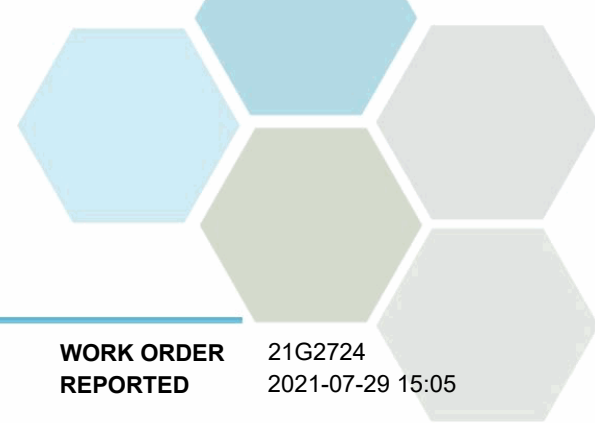
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2724
2021-07-29 15:05

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G2724-01) Matrix: Water Sampled: 2021-07-21 10:10					FILT, PRES

Anions

Chloride	122	0.10	mg/L	2021-07-23	
Fluoride	0.14	0.10	mg/L	2021-07-23	
Nitrate (as N)	2.27	0.010	mg/L	2021-07-23	
Nitrite (as N)	0.025	0.010	mg/L	2021-07-23	
Phosphate (as P)	0.0406	0.0050	mg/L	2021-07-23	
Sulfate	49.4	1.0	mg/L	2021-07-23	

Calculated Parameters

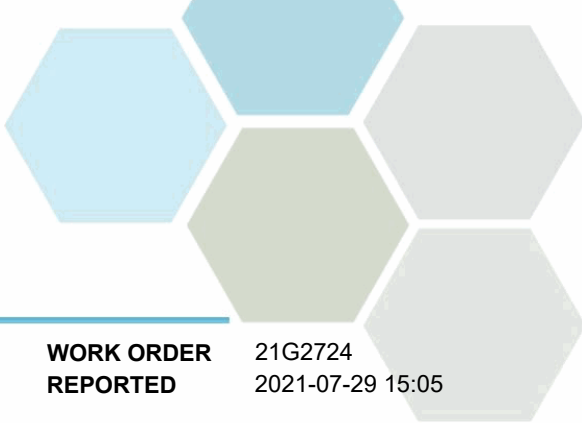
Hardness, Total (as CaCO3)	245	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	2.29	0.0100	mg/L	N/A	
Nitrogen, Total	3.36	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	248	1.0	mg/L	2021-07-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Bicarbonate (as CaCO3)	248	1.0	mg/L	2021-07-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Ammonia, Total (as N)	0.149	0.050	mg/L	2021-07-26	
BOD, 5-day	< 1.0	2.0	mg/L	2021-07-28	
BOD, 5-day Carbonaceous	< 1.0	2.0	mg/L	2021-07-28	
Chemical Oxygen Demand	21	20	mg/L	2021-07-26	
Conductivity (EC)	918	2.0	µS/cm	2021-07-25	
Nitrogen, Total Kjeldahl	1.07	0.050	mg/L	2021-07-27	
pH	7.89	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.149	0.0050	mg/L	2021-07-27	
Phosphorus, Total Dissolved	0.140	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-28	
UV Transmittance @ 254nm	70.9	0.10	% T	2021-07-23	

Total Metals

Aluminum, total	0.0288	0.0050	mg/L	2021-07-29	
Antimony, total	0.00026	0.00020	mg/L	2021-07-29	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-07-29	
Barium, total	0.0540	0.0050	mg/L	2021-07-29	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-07-29	
Boron, total	0.176	0.0500	mg/L	2021-07-29	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-07-29	
Calcium, total	74.4	0.20	mg/L	2021-07-29	
Chromium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Cobalt, total	0.00020	0.00010	mg/L	2021-07-29	
Copper, total	0.00133	0.00040	mg/L	2021-07-29	
Iron, total	0.034	0.010	mg/L	2021-07-29	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2724
2021-07-29 15:05

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G2724-01) Matrix: Water Sampled: 2021-07-21 10:10, Continued					FILT, PRES

Total Metals, Continued

Lead, total	< 0.00020	0.00020	mg/L	2021-07-29	
Lithium, total	0.00769	0.00010	mg/L	2021-07-29	
Magnesium, total	14.3	0.010	mg/L	2021-07-29	
Manganese, total	0.0389	0.00020	mg/L	2021-07-29	
Mercury, total	< 0.000010	0.000010	mg/L	2021-07-28	
Molybdenum, total	0.00097	0.00010	mg/L	2021-07-29	
Nickel, total	0.00202	0.00040	mg/L	2021-07-29	
Phosphorus, total	0.135	0.050	mg/L	2021-07-29	
Potassium, total	19.3	0.10	mg/L	2021-07-29	
Selenium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Silicon, total	10.8	1.0	mg/L	2021-07-29	
Silver, total	< 0.000050	0.000050	mg/L	2021-07-29	
Sodium, total	93.5	0.10	mg/L	2021-07-29	
Strontium, total	0.613	0.0010	mg/L	2021-07-29	
Sulfur, total	17.7	3.0	mg/L	2021-07-29	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Thallium, total	< 0.000020	0.000020	mg/L	2021-07-29	
Thorium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Tin, total	< 0.00020	0.00020	mg/L	2021-07-29	
Titanium, total	< 0.0050	0.0050	mg/L	2021-07-29	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-07-29	
Uranium, total	0.00301	0.000020	mg/L	2021-07-29	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-07-29	
Zinc, total	0.0299	0.0040	mg/L	2021-07-29	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-07-29	

Effluent Grab (21G2724-02) | Matrix: Water | Sampled: 2021-07-21 10:10

FILT, PRES

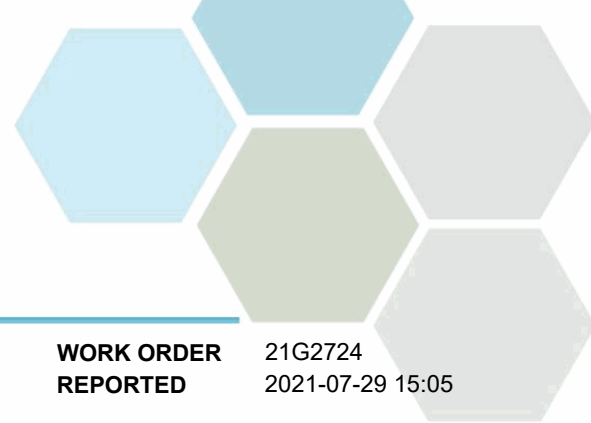
Anions

Chloride	122	0.10	mg/L	2021-07-23	
Fluoride	0.14	0.10	mg/L	2021-07-23	
Nitrate (as N)	2.28	0.010	mg/L	2021-07-23	
Nitrite (as N)	0.025	0.010	mg/L	2021-07-23	
Phosphate (as P)	0.0436	0.0050	mg/L	2021-07-23	
Sulfate	46.6	1.0	mg/L	2021-07-23	

Calculated Parameters

Hardness, Total (as CaCO3)	257	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	2.30	0.0100	mg/L	N/A	
Nitrogen, Total	3.42	0.0500	mg/L	N/A	

General Parameters



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2724
2021-07-29 15:05

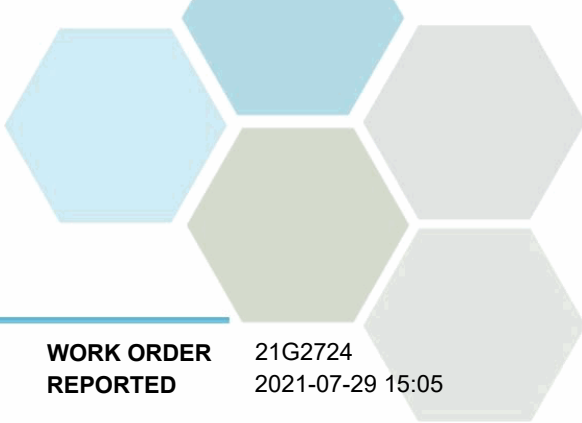
Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G2724-02) Matrix: Water Sampled: 2021-07-21 10:10, Continued					FILT, PRES

General Parameters, Continued

Alkalinity, Total (as CaCO3)	249	1.0	mg/L	2021-07-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Bicarbonate (as CaCO3)	249	1.0	mg/L	2021-07-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Ammonia, Total (as N)	0.167	0.050	mg/L	2021-07-26	
BOD, 5-day	< 1.0	2.0	mg/L	2021-07-28	
BOD, 5-day Carbonaceous	< 1.0	2.0	mg/L	2021-07-28	
Chemical Oxygen Demand	21	20	mg/L	2021-07-26	
Conductivity (EC)	919	2.0	µS/cm	2021-07-25	
Nitrogen, Total Kjeldahl	1.12	0.050	mg/L	2021-07-27	
pH	7.87	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.152	0.0050	mg/L	2021-07-27	
Phosphorus, Total Dissolved	0.138	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-28	
UV Transmittance @ 254nm	71.0	0.10	% T	2021-07-23	

Total Metals

Aluminum, total	0.0272	0.0050	mg/L	2021-07-28	
Antimony, total	< 0.00020	0.00020	mg/L	2021-07-28	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-07-28	
Barium, total	0.0511	0.0050	mg/L	2021-07-28	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-07-28	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-07-28	
Boron, total	0.169	0.0500	mg/L	2021-07-28	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-07-28	
Calcium, total	78.8	0.20	mg/L	2021-07-28	
Chromium, total	< 0.00050	0.00050	mg/L	2021-07-28	
Cobalt, total	0.00017	0.00010	mg/L	2021-07-28	
Copper, total	0.00113	0.00040	mg/L	2021-07-28	
Iron, total	0.033	0.010	mg/L	2021-07-28	
Lead, total	< 0.00020	0.00020	mg/L	2021-07-28	
Lithium, total	0.00714	0.00010	mg/L	2021-07-28	
Magnesium, total	14.6	0.010	mg/L	2021-07-28	
Manganese, total	0.0401	0.00020	mg/L	2021-07-28	
Mercury, total	< 0.000010	0.000010	mg/L	2021-07-28	
Molybdenum, total	0.00113	0.00010	mg/L	2021-07-28	
Nickel, total	0.00146	0.00040	mg/L	2021-07-28	
Phosphorus, total	0.162	0.050	mg/L	2021-07-28	
Potassium, total	19.9	0.10	mg/L	2021-07-28	
Selenium, total	< 0.00050	0.00050	mg/L	2021-07-28	
Silicon, total	10.4	1.0	mg/L	2021-07-28	
Silver, total	< 0.000050	0.000050	mg/L	2021-07-28	



TEST RESULTS

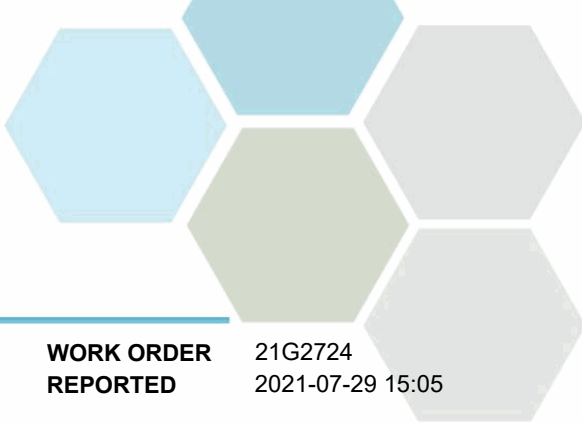
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2724
2021-07-29 15:05

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G2724-02) Matrix: Water Sampled: 2021-07-21 10:10, Continued					FILT, PRES
<i>Total Metals, Continued</i>					
Sodium, total	88.4	0.10	mg/L	2021-07-28	
Strontium, total	0.605	0.0010	mg/L	2021-07-28	
Sulfur, total	17.4	3.0	mg/L	2021-07-28	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-07-28	
Thallium, total	< 0.000020	0.000020	mg/L	2021-07-28	
Thorium, total	< 0.00010	0.00010	mg/L	2021-07-28	
Tin, total	< 0.00020	0.00020	mg/L	2021-07-28	
Titanium, total	< 0.0050	0.0050	mg/L	2021-07-28	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-07-28	
Uranium, total	0.00290	0.000020	mg/L	2021-07-28	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-07-28	
Zinc, total	0.0324	0.0040	mg/L	2021-07-28	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-07-28	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

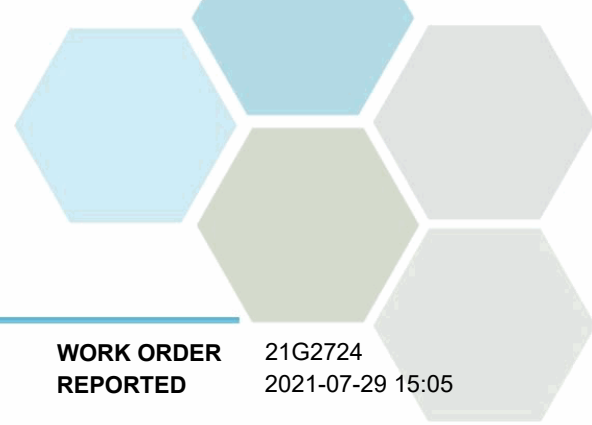
WORK ORDER REPORTED 21G2724
2021-07-29 15:05

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2724
2021-07-29 15:05

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2731
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-22 12:30 / 10.8°C
PO NUMBER	OK Falls WW	COC NUMBER	B095372
PROJECT	OK Falls WWTP QCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

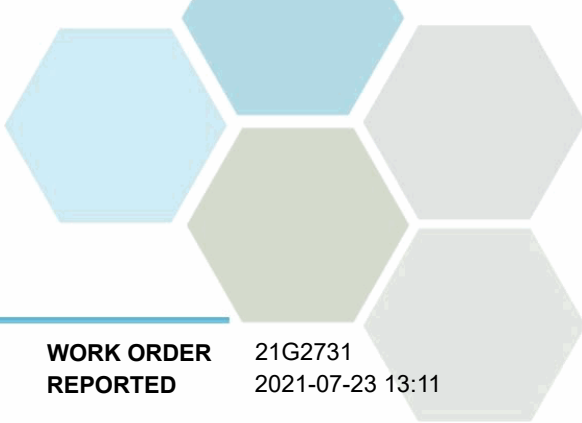
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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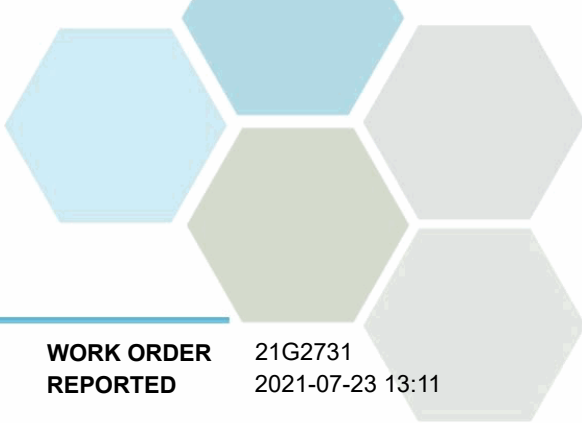


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2731
2021-07-23 13:11

Analyte	Result	RL	Units	Analyzed	Qualifier
Rep 1 Effluent Grab - Bacteria (21G2731-01) Matrix: Water Sampled: 2021-07-21 10:10					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-07-22	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-07-22	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2731
2021-07-23 13:11

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2733
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-22 12:30 / 10.8°C
PO NUMBER	OK Falls WW	COC NUMBER	B095372
PROJECT	OK Falls WWTP QCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

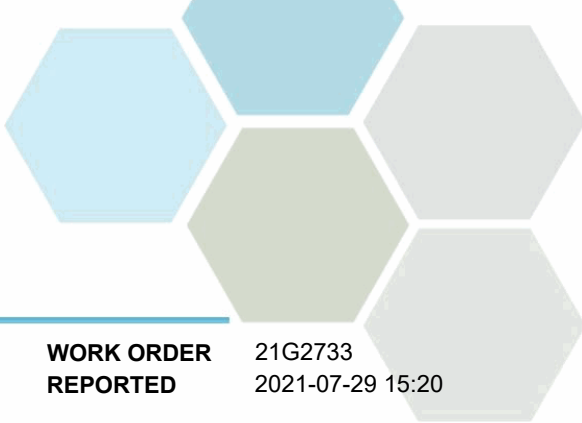
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Authorized By:

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2733
2021-07-29 15:20

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G2733-01) Matrix: Water Sampled: 2021-07-21 10:10					FILT, PRES

Anions

Chloride	118	0.10	mg/L	2021-07-23	
Fluoride	0.16	0.10	mg/L	2021-07-23	
Nitrate (as N)	2.28	0.010	mg/L	2021-07-23	
Nitrite (as N)	0.026	0.010	mg/L	2021-07-23	
Phosphate (as P)	0.0500	0.0050	mg/L	2021-07-23	
Sulfate	46.7	1.0	mg/L	2021-07-23	

Calculated Parameters

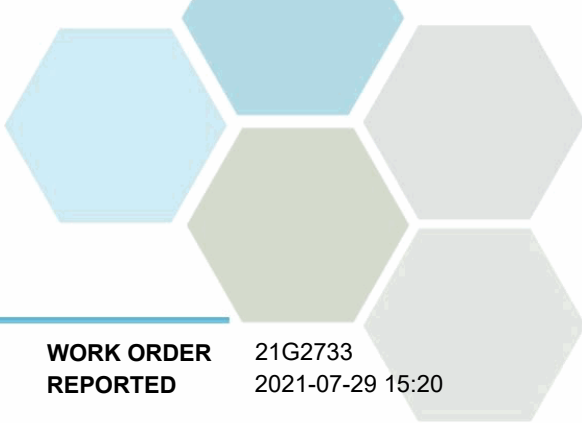
Hardness, Total (as CaCO3)	253	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	2.30	0.0100	mg/L	N/A	
Nitrogen, Total	3.39	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	246	1.0	mg/L	2021-07-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Bicarbonate (as CaCO3)	246	1.0	mg/L	2021-07-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Ammonia, Total (as N)	0.167	0.050	mg/L	2021-07-26	
BOD, 5-day	< 1.0	2.0	mg/L	2021-07-28	
BOD, 5-day Carbonaceous	< 5.3	2.0	mg/L	2021-07-28	
Chemical Oxygen Demand	22	20	mg/L	2021-07-26	
Conductivity (EC)	925	2.0	µS/cm	2021-07-25	
Nitrogen, Total Kjeldahl	1.08	0.050	mg/L	2021-07-27	
pH	7.97	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.152	0.0050	mg/L	2021-07-27	
Phosphorus, Total Dissolved	0.135	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 4.0	2.0	mg/L	2021-07-28	
UV Transmittance @ 254nm	71.1	0.10	% T	2021-07-23	

Total Metals

Aluminum, total	0.0651	0.0050	mg/L	2021-07-28	
Antimony, total	< 0.00020	0.00020	mg/L	2021-07-28	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-07-28	
Barium, total	0.0507	0.0050	mg/L	2021-07-28	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-07-28	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-07-28	
Boron, total	0.166	0.0500	mg/L	2021-07-28	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-07-28	
Calcium, total	77.4	0.20	mg/L	2021-07-28	
Chromium, total	< 0.00050	0.00050	mg/L	2021-07-28	
Cobalt, total	0.00018	0.00010	mg/L	2021-07-28	
Copper, total	0.00127	0.00040	mg/L	2021-07-28	
Iron, total	0.032	0.010	mg/L	2021-07-28	



TEST RESULTS

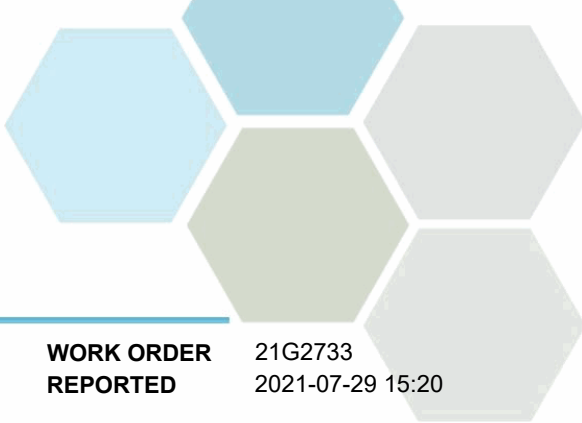
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2733
2021-07-29 15:20

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G2733-01) Matrix: Water Sampled: 2021-07-21 10:10, Continued					FILT, PRES
<i>Total Metals, Continued</i>					
Lead, total	< 0.00020	0.00020	mg/L	2021-07-28	
Lithium, total	0.00673	0.00010	mg/L	2021-07-28	
Magnesium, total	14.4	0.010	mg/L	2021-07-28	
Manganese, total	0.0375	0.00020	mg/L	2021-07-28	
Mercury, total	< 0.000010	0.000010	mg/L	2021-07-28	
Molybdenum, total	0.00104	0.00010	mg/L	2021-07-28	
Nickel, total	0.00168	0.00040	mg/L	2021-07-28	
Phosphorus, total	0.197	0.050	mg/L	2021-07-28	
Potassium, total	19.4	0.10	mg/L	2021-07-28	
Selenium, total	< 0.00050	0.00050	mg/L	2021-07-28	
Silicon, total	10.3	1.0	mg/L	2021-07-28	
Silver, total	< 0.000050	0.000050	mg/L	2021-07-28	
Sodium, total	87.2	0.10	mg/L	2021-07-28	
Strontium, total	0.589	0.0010	mg/L	2021-07-28	
Sulfur, total	17.6	3.0	mg/L	2021-07-28	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-07-28	
Thallium, total	< 0.000020	0.000020	mg/L	2021-07-28	
Thorium, total	< 0.00010	0.00010	mg/L	2021-07-28	
Tin, total	< 0.00020	0.00020	mg/L	2021-07-28	
Titanium, total	< 0.0050	0.0050	mg/L	2021-07-28	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-07-28	
Uranium, total	0.00277	0.000020	mg/L	2021-07-28	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-07-28	
Zinc, total	0.0322	0.0040	mg/L	2021-07-28	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-07-28	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

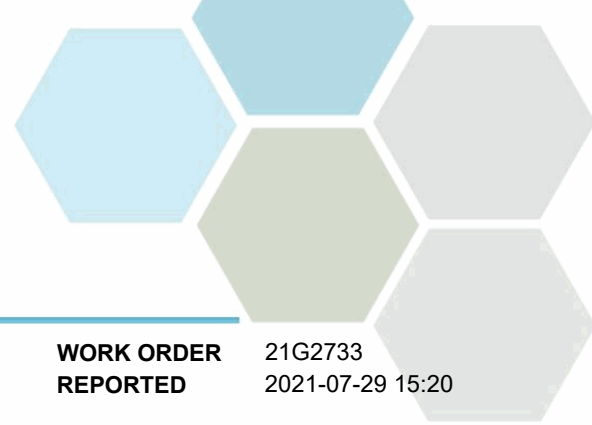
WORK ORDER REPORTED 21G2733
2021-07-29 15:20

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21G2733
2021-07-29 15:20

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G3452
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-28 08:00 / 4.8°C
PO NUMBER	OK Falls WW	COC NUMBER	B095374
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

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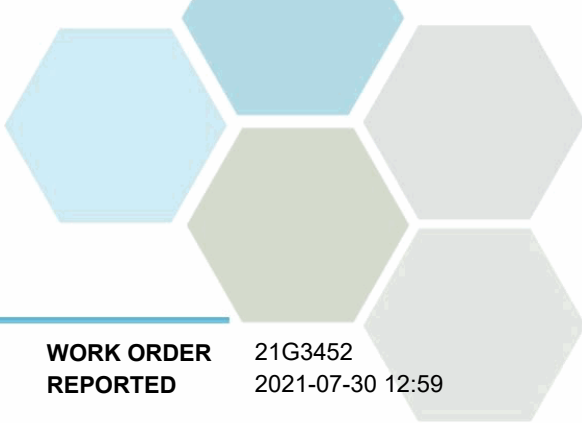
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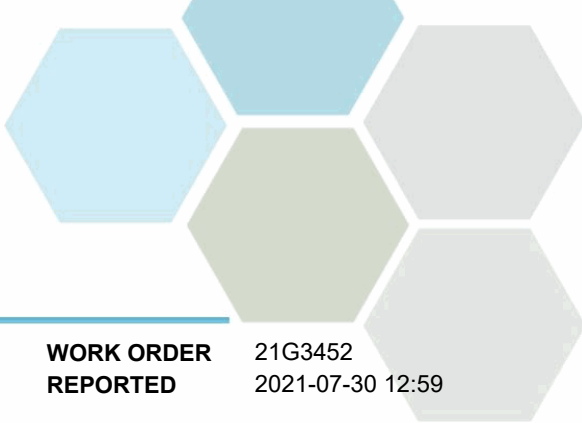


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G3452
2021-07-30 12:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21G3452-01) Matrix: Water Sampled: 2021-07-27 11:07					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-07-28	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-07-28	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G3452
2021-07-30 12:59

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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MPN/100 mL	Most Probable Number per 100 millilitres
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CERTIFICATE OF ANALYSIS

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ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-28 08:00 / 4.8°C
PO NUMBER	OK Falls WW	COC NUMBER	B095374
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

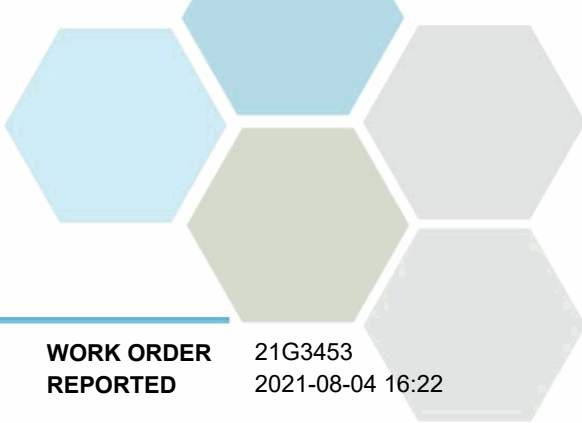
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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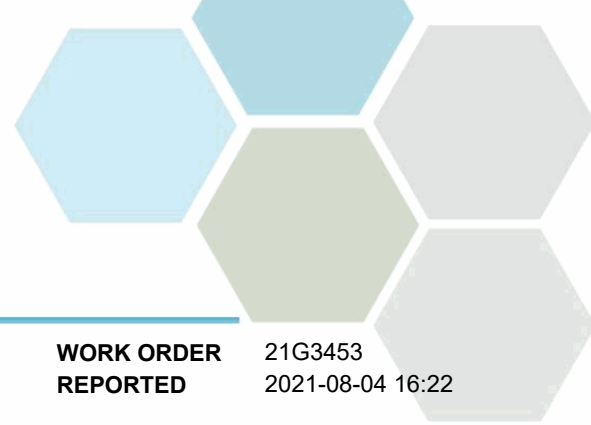


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G3453
2021-08-04 16:22

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21G3453-01) Matrix: Fresh Water Sampled: 2021-07-27 11:07					
<i>Anions</i>					
Nitrate (as N)	1.53	0.010	mg/L	2021-07-29	
Nitrite (as N)	0.033	0.010	mg/L	2021-07-29	
Phosphate (as P)	0.0416	0.0050	mg/L	2021-07-29	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.150	0.050	mg/L	2021-07-29	
Chemical Oxygen Demand	13	20	mg/L	2021-08-03	
Phosphorus, Total (as P)	0.105	0.0050	mg/L	2021-08-04	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-31	
UV Transmittance @ 254nm	73.4	0.10	% T	2021-07-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21G3453
2021-08-04 16:22

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H0504
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-05 13:57 / 8.9°C 2021-08-06 16:11
PO NUMBER	OK Falls WW	COC NUMBER	B095375
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

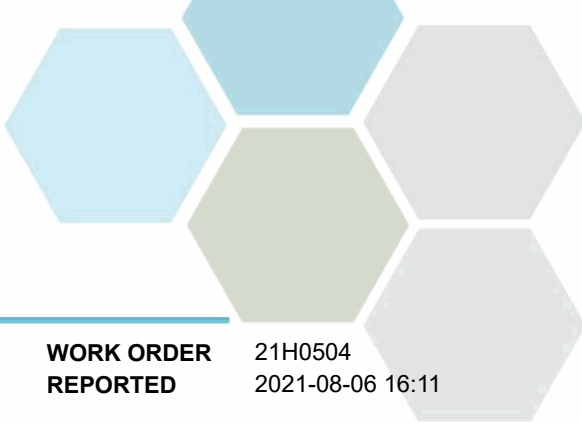
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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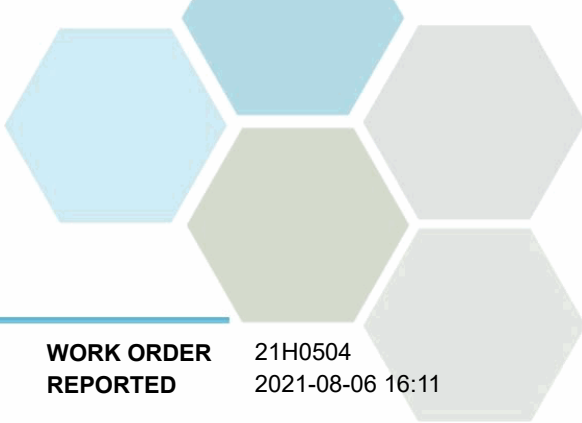


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H0504
2021-08-06 16:11

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21H0504-01) Matrix: Water Sampled: 2021-08-04 10:30					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	2	1	MPN/100 mL	2021-08-05	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-08-05	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H0504
2021-08-06 16:11

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H0506
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-05 13:57 / 8.9°C 2021-08-12 16:24
PO NUMBER	OK Falls WW	COC NUMBER	B095375
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

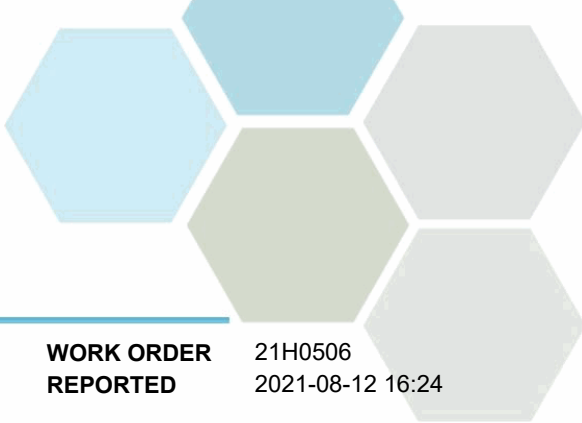
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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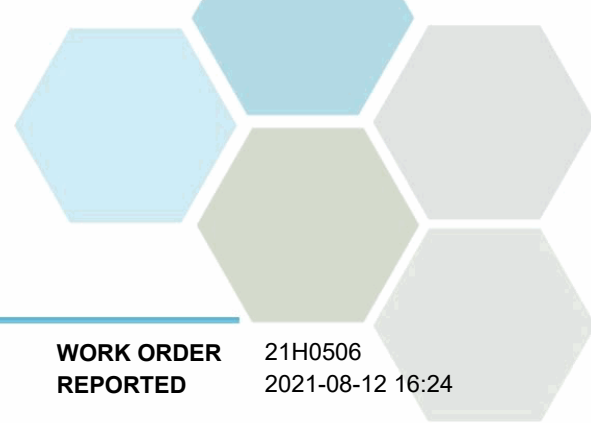


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H0506
2021-08-12 16:24

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21H0506-01) Matrix: Fresh Water Sampled: 2021-08-04 10:30					
<i>Anions</i>					
Nitrate (as N)	2.53	0.010	mg/L	2021-08-06	
Nitrite (as N)	0.021	0.010	mg/L	2021-08-06	
Phosphate (as P)	0.0729	0.0050	mg/L	2021-08-06	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.156	0.050	mg/L	2021-08-09	
Chemical Oxygen Demand	24	20	mg/L	2021-08-12	
Phosphorus, Total (as P)	0.160	0.0050	mg/L	2021-08-10	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-08-09	
UV Transmittance @ 254nm	72.8	0.10	% T	2021-08-06	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H0506
2021-08-12 16:24

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H1182
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-11 13:00 / 10.0°C 2021-08-12 16:06
PO NUMBER	OK Falls WW	COC NUMBER	B095376
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

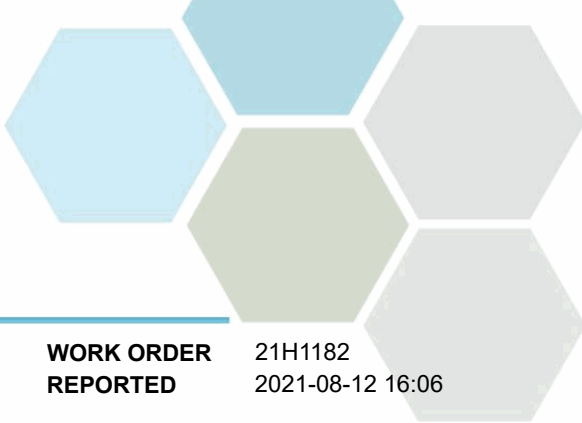
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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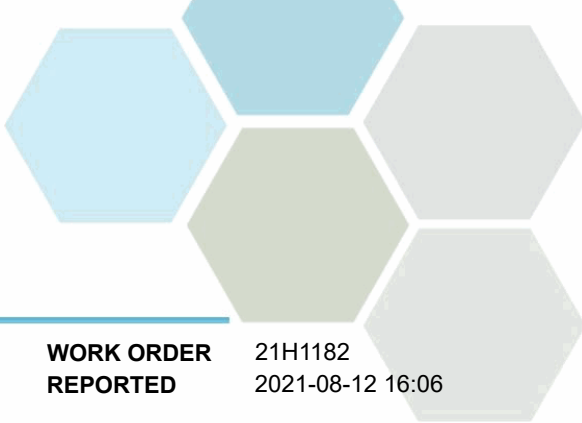


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21H1182
2021-08-12 16:06

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE Bacterial (21H1182-01) Matrix: Water Sampled: 2021-08-10 11:58					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-08-11	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-08-11	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21H1182
2021-08-12 16:06

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H1192
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-11 13:00 / 10.0°C 2021-08-18 09:38
PO NUMBER	OK Falls WW	COC NUMBER	B095376
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

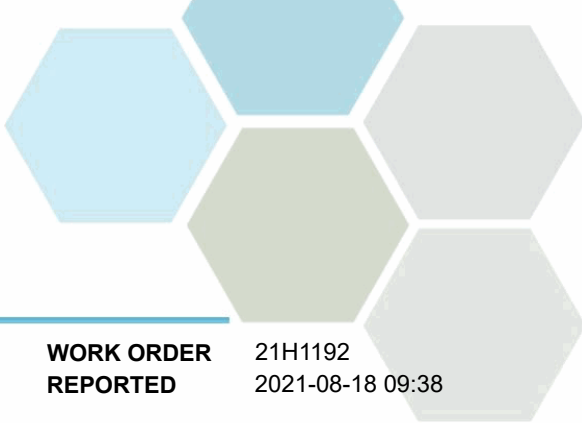
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

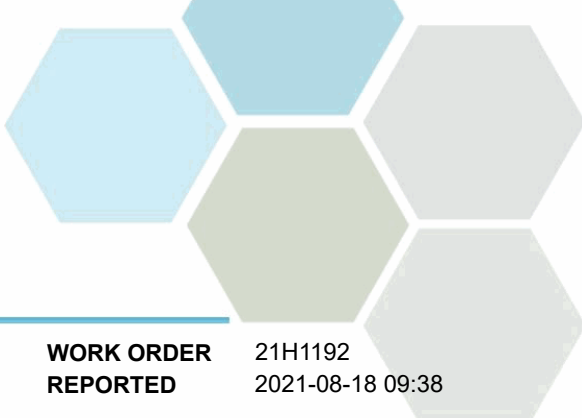
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21H1192
2021-08-18 09:38

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE (21H1192-01) Matrix: Water Sampled: 2021-08-10 11:50					FILT, PRES
Anions					
Nitrate (as N)	1.52	0.010	mg/L	2021-08-13	
Nitrite (as N)	0.052	0.010	mg/L	2021-08-13	
Phosphate (as P)	0.0111	0.0050	mg/L	2021-08-13	
Calculated Parameters					
Nitrate+Nitrite (as N)	1.57	0.0100	mg/L	N/A	
Nitrogen, Total	2.73	0.0500	mg/L	N/A	
Nitrogen, Organic	1.01	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	0.141	0.050	mg/L	2021-08-12	
BOD, 5-day	1.3	2.0	mg/L	2021-08-17	
Chemical Oxygen Demand	28	20	mg/L	2021-08-12	
Nitrogen, Total Kjeldahl	1.16	0.050	mg/L	2021-08-17	
pH	7.79	0.10	pH units	2021-08-12	HT2
Phosphorus, Total (as P)	0.0889	0.0050	mg/L	2021-08-17	
Phosphorus, Total Dissolved	0.0648	0.0050	mg/L	2021-08-17	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-08-16	
UV Transmittance @ 254nm	63.0	0.10	% T	2021-08-13	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21H1192
2021-08-18 09:38

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

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mg/L	Milligrams per litre
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H2287
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-19 13:30 / 5.0°C
PO NUMBER	OK Falls WW	COC NUMBER	B095377
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

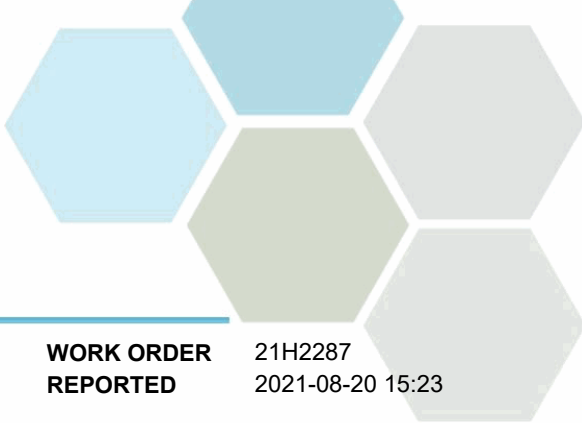
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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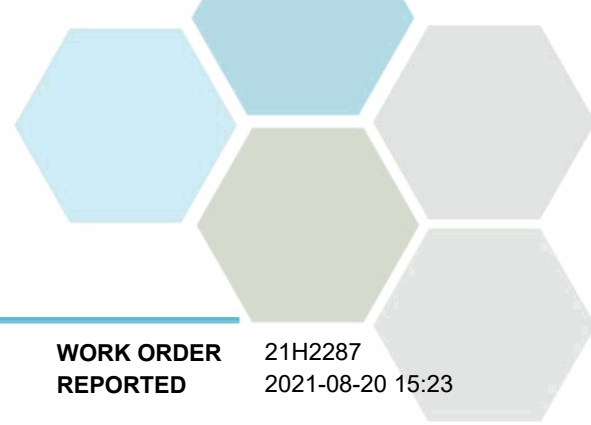


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H2287
2021-08-20 15:23

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21H2287-01) Matrix: Water Sampled: 2021-08-18 12:02					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-08-19	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-08-19	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H2287
2021-08-20 15:23

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21H2289

RECEIVED / TEMP 2021-08-19 13:30 / 5.0°C

REPORTED 2021-08-25 15:17

COC NUMBER B095377

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



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Work Order Comments:

Custody Seals Intact: YES

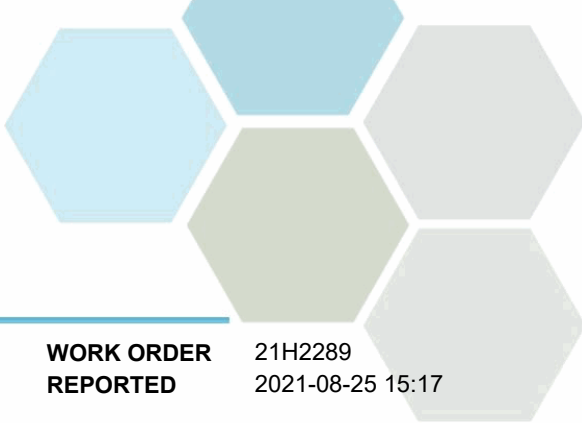
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

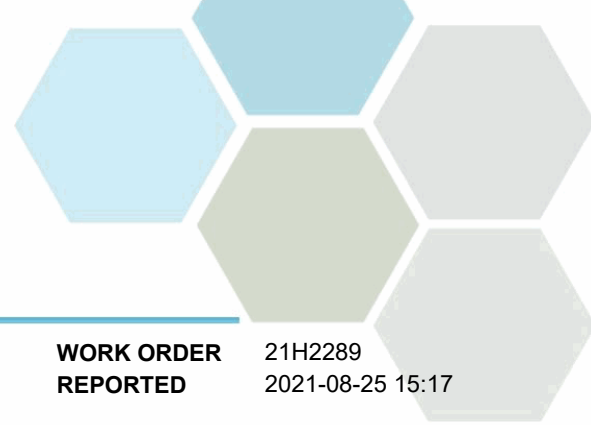


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H2289
2021-08-25 15:17

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21H2289-01) Matrix: Fresh Water Sampled: 2021-08-18 12:02					
<i>Anions</i>					
Nitrate (as N)	3.07	0.010	mg/L	2021-08-21	
Nitrite (as N)	0.039	0.010	mg/L	2021-08-21	
Phosphate (as P)	0.0442	0.0050	mg/L	2021-08-21	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.217	0.050	mg/L	2021-08-20	
Chemical Oxygen Demand	15	20	mg/L	2021-08-25	
Phosphorus, Total (as P)	0.101	0.0050	mg/L	2021-08-25	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-08-23	
UV Transmittance @ 254nm	72.9	0.10	% T	2021-08-20	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H2289
2021-08-25 15:17

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H3412
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-27 15:05 / 12.6°C 2021-08-30 13:39
PO NUMBER	OK Falls WW	COC NUMBER	B095855
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

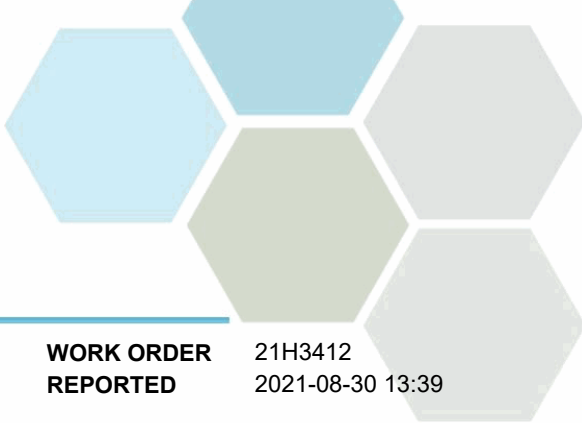
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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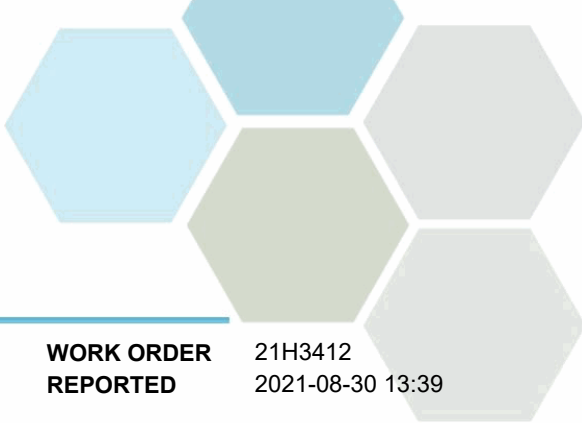


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H3412
2021-08-30 13:39

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21H3412-01) Matrix: Water Sampled: 2021-08-27 13:40					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-08-27	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-08-27	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H3412
2021-08-30 13:39

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H3425
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-27 08:15 / 9.6°C
PO NUMBER	OK Falls WW	REPORTED	2021-09-03 08:50
PROJECT	OK Falls WWTP WAE	COC NUMBER	B095378
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

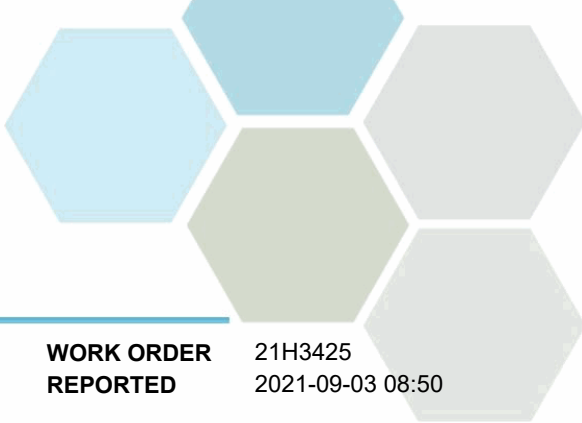
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

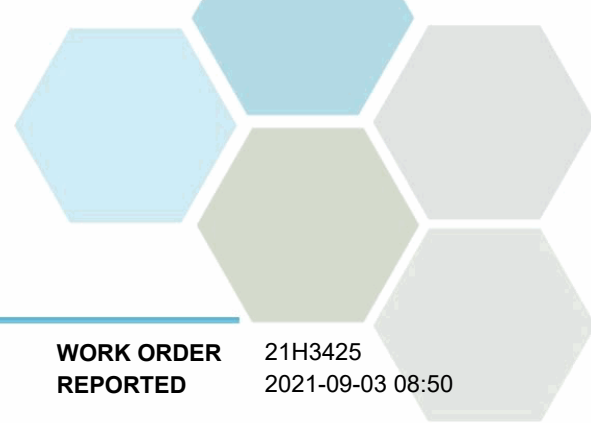
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H3425
2021-09-03 08:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21H3425-01) Matrix: Fresh Water Sampled: 2021-08-25 11:25					
Anions					
Nitrate (as N)	2.37	0.010	mg/L	2021-08-29	HT1
Nitrite (as N)	0.033	0.010	mg/L	2021-08-29	HT1
Phosphate (as P)	0.0254	0.0050	mg/L	2021-08-29	HT1
General Parameters					
Ammonia, Total (as N)	0.250	0.050	mg/L	2021-08-31	
Chemical Oxygen Demand	22	20	mg/L	2021-09-02	
Phosphorus, Total (as P)	0.130	0.0050	mg/L	2021-08-31	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-02	HT1
UV Transmittance @ 254nm	71.4	0.10	% T	2021-09-01	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21H3425
2021-09-03 08:50

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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% T	Percent Transmittance
<	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
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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 2110155

RECEIVED / TEMP 2021-09-01 14:00 / 12.1°C

REPORTED 2021-09-02 17:31

COC NUMBER B095379

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.

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Work Order Comments:

Custody Seals Intact: YES

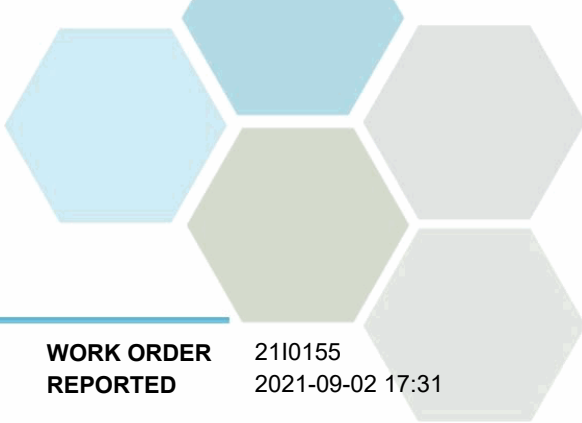
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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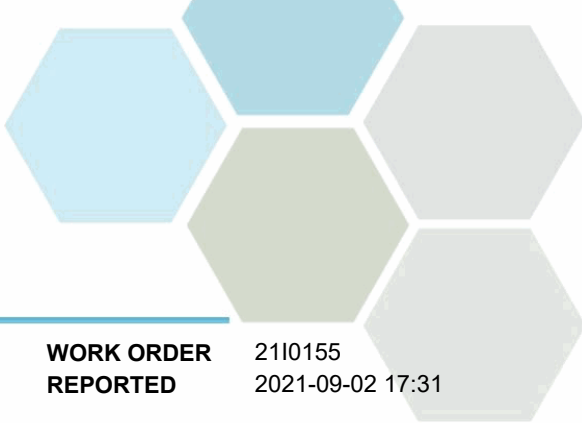


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2110155
2021-09-02 17:31

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (2110155-01) Matrix: Water Sampled: 2021-08-31 11:50					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-09-01	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-09-01	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2110155
2021-09-02 17:31

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2110156
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-01 14:00 / 12.1°C 2021-09-08 13:39
PO NUMBER	OK Falls WW	COC NUMBER	B095379
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

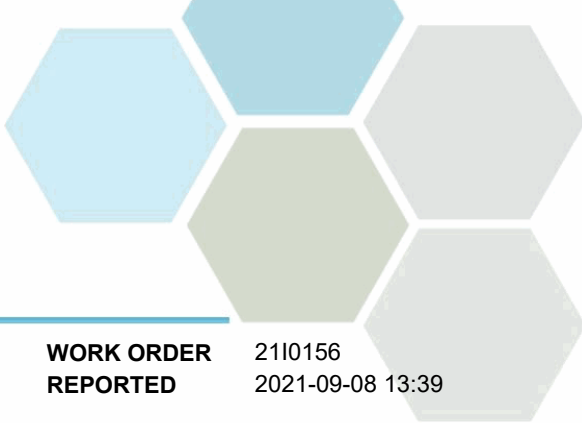
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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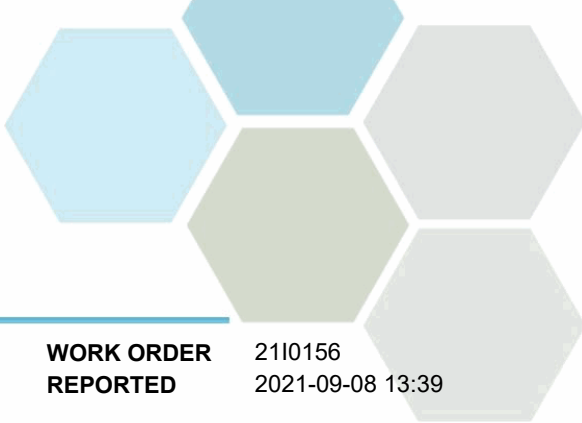


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2110156
2021-09-08 13:39

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (2110156-01) Matrix: Fresh Water Sampled: 2021-08-31 11:50					
<i>Anions</i>					
Nitrate (as N)	1.77	0.010	mg/L	2021-09-02	
Nitrite (as N)	0.027	0.010	mg/L	2021-09-02	
Phosphate (as P)	0.0747	0.0050	mg/L	2021-09-02	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.197	0.050	mg/L	2021-09-03	
Chemical Oxygen Demand	20	20	mg/L	2021-09-02	
Phosphorus, Total (as P)	0.174	0.0050	mg/L	2021-09-03	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-03	
UV Transmittance @ 254nm	73.3	0.10	% T	2021-09-01	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2110156
2021-09-08 13:39

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

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% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2111002
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-08 12:35 / 7.3°C
PO NUMBER	OK Falls WW	REPORTED	2021-09-10 16:04
PROJECT	OK Falls WWTP WAE	COC NUMBER	B095380
PROJECT INFO			

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.

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Ahead of the Curve



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Work Order Comments:

Custody Seals Intact: YES

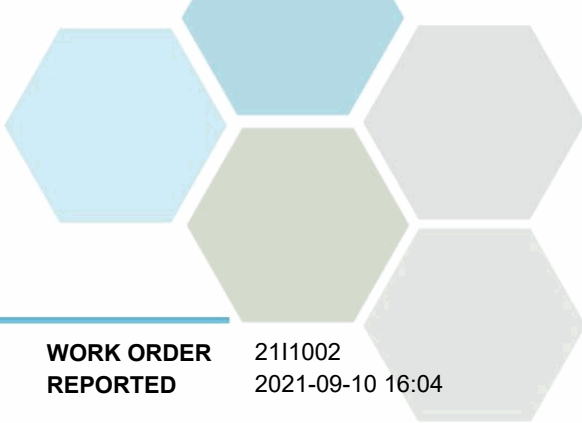
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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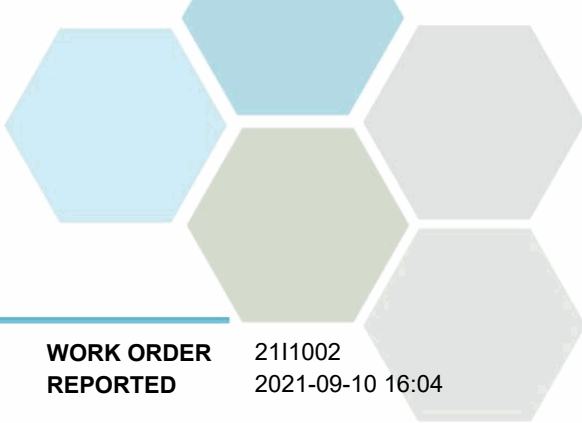


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2111002
2021-09-10 16:04

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (2111002-01) Matrix: Water Sampled: 2021-09-07 13:25					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-09-08	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-09-08	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2111002
2021-09-10 16:04

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2111030
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-08 12:35 / 7.3°C 2021-09-14 16:14
PO NUMBER	OK Falls WW	COC NUMBER	B095380
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

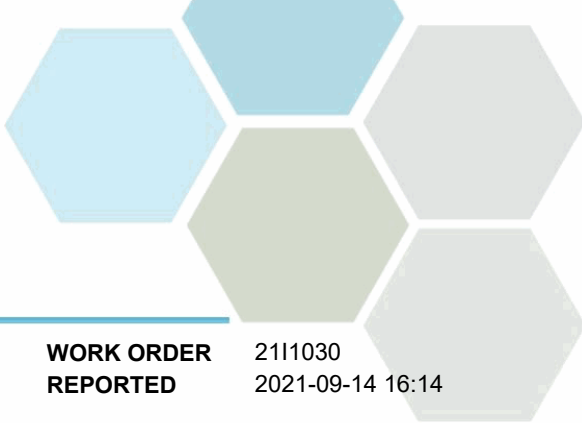
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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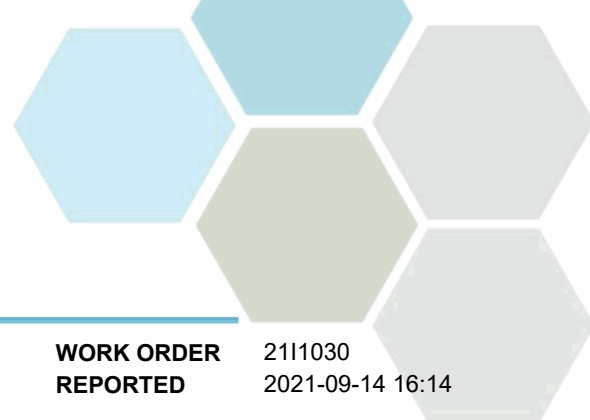


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2111030
2021-09-14 16:14

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (2111030-01) Matrix: Fresh Water Sampled: 2021-09-07 13:25					
<i>Anions</i>					
Nitrate (as N)	2.02	0.010	mg/L	2021-09-09	
Nitrite (as N)	0.050	0.010	mg/L	2021-09-09	
Phosphate (as P)	0.0766	0.0050	mg/L	2021-09-09	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.163	0.050	mg/L	2021-09-10	
Chemical Oxygen Demand	24	20	mg/L	2021-09-14	
Phosphorus, Total (as P)	0.175	0.0050	mg/L	2021-09-13	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-12	
UV Transmittance @ 254nm	71.9	0.10	% T	2021-09-09	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2111030
2021-09-14 16:14

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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% T	Percent Transmittance
<	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
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2111684
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-14 11:55 / 7.8°C
PO NUMBER	OK Falls WW	COC NUMBER	B095381
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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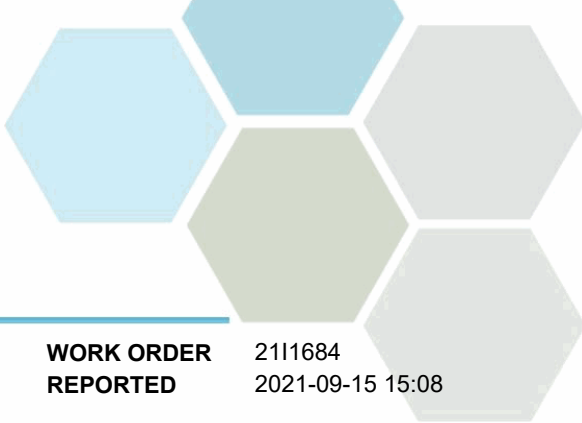
<p><i>Big Picture Sidekicks</i></p>  <p>You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.</p>	<p><i>We've Got Chemistry</i></p>  <p>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.</p>	<p><i>Ahead of the Curve</i></p>  <p>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.</p>
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Work Order Comments: Custody Seals Intact: YES

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

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

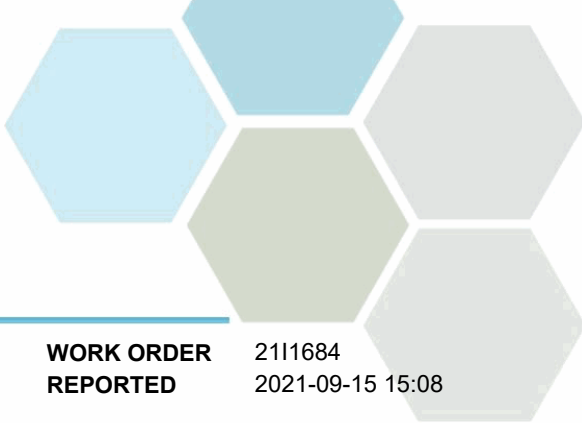


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2111684
2021-09-15 15:08

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (2111684-01) Matrix: Water Sampled: 2021-09-13 12:05					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-09-14	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-09-14	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2111684
2021-09-15 15:08

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2111686
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-14 11:55 / 7.8°C 2021-09-22 14:17
PO NUMBER	OK Falls WW	COC NUMBER	B095381
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

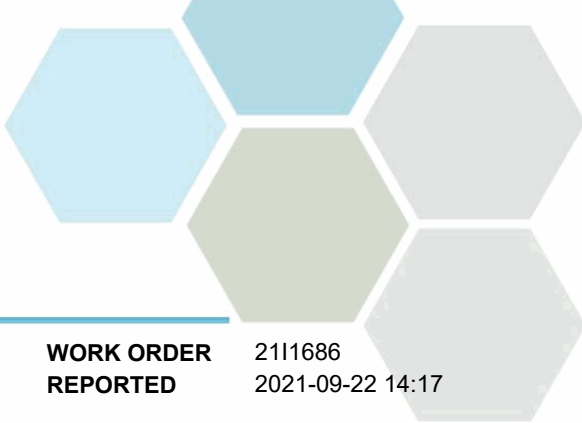
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

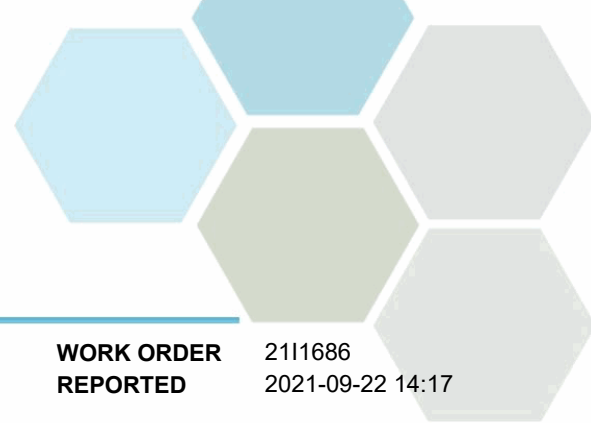
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2111686
2021-09-22 14:17

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (2111686-01) Matrix: Fresh Water Sampled: 2021-09-13 12:05					
Anions					
Nitrate (as N)	2.26	0.010	mg/L	2021-09-15	
Nitrite (as N)	0.062	0.010	mg/L	2021-09-15	
Phosphate (as P)	0.0253	0.0050	mg/L	2021-09-15	
General Parameters					
Ammonia, Total (as N)	0.209	0.050	mg/L	2021-09-16	
Chemical Oxygen Demand	24	20	mg/L	2021-09-22	
Phosphorus, Total (as P)	0.124	0.0050	mg/L	2021-09-17	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-15	
UV Transmittance @ 254nm	71.6	0.10	% T	2021-09-17	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2111686
2021-09-22 14:17

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2112954
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-22 12:30 / 8.6°C
PO NUMBER	OK Falls WW	REPORTED	2021-09-24 14:43
PROJECT	OK Falls WWTP MCE	COC NUMBER	B095385
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

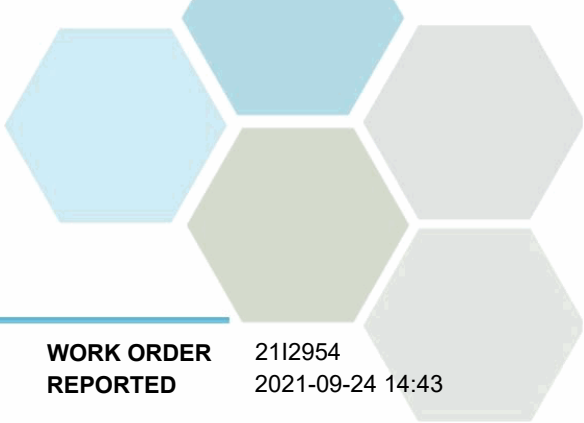
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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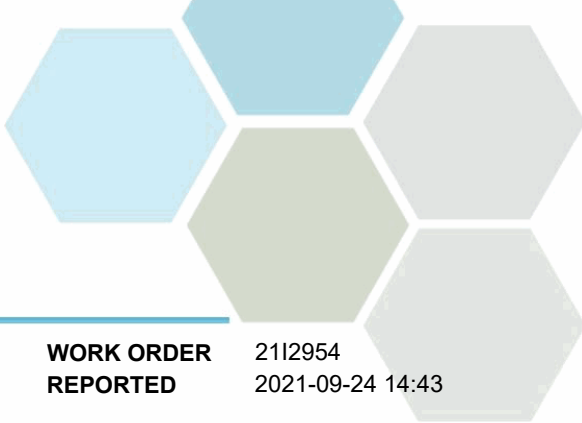


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 2112954
2021-09-24 14:43

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE Bacterial (2112954-01) Matrix: Water Sampled: 2021-09-21 10:48					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-09-22	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-09-22	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 2112954
2021-09-24 14:43

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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MPN/100 mL	Most Probable Number per 100 millilitres
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2112976
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-22 12:30 / 8.6°C
PO NUMBER	OK Falls WW	COC NUMBER	B095385
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

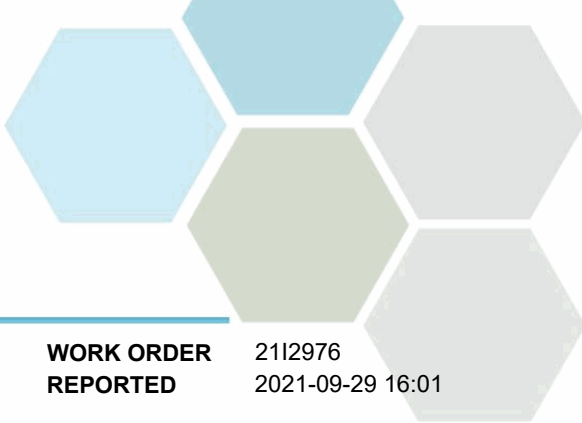
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

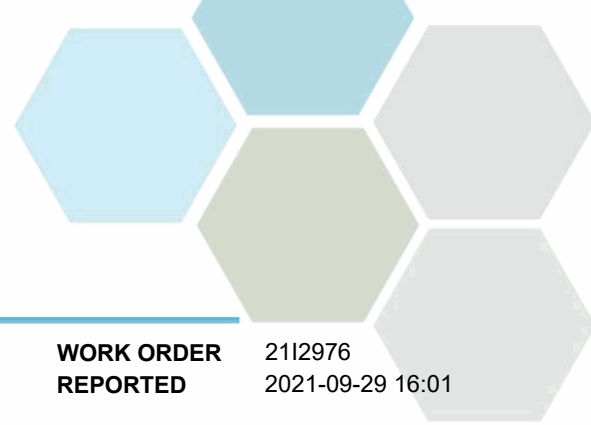
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 2112976
2021-09-29 16:01

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE (2112976-01) Matrix: Water Sampled: 2021-09-21 10:48					FILT, PRES
Anions					
Nitrate (as N)	1.76	0.010	mg/L	2021-09-23	
Nitrite (as N)	0.162	0.010	mg/L	2021-09-23	
Phosphate (as P)	0.0136	0.0050	mg/L	2021-09-23	
Calculated Parameters					
Nitrate+Nitrite (as N)	1.92	0.0100	mg/L	N/A	
Nitrogen, Total	3.38	0.0500	mg/L	N/A	
Nitrogen, Organic	1.13	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	0.329	0.050	mg/L	2021-09-24	
BOD, 5-day Carbonaceous	< 7.4	2.0	mg/L	2021-09-28	
Chemical Oxygen Demand	38	20	mg/L	2021-09-28	
Nitrogen, Total Kjeldahl	1.46	0.050	mg/L	2021-09-28	
pH	7.65	0.10	pH units	2021-09-27	HT2
Phosphorus, Total (as P)	0.124	0.0050	mg/L	2021-09-28	
Phosphorus, Total Dissolved	0.0882	0.0050	mg/L	2021-09-28	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-28	
UV Transmittance @ 254nm	68.7	0.10	% T	2021-09-29	HT1

Sample Qualifiers:

- FILT The sample has been filtered for tdp in the laboratory. Results may not reflect conditions at the time of sampling.
- 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.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 2112976
2021-09-29 16:01

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2113932
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-29 12:00 / 10.0°C
PO NUMBER	OK Falls WW	COC NUMBER	B095389
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

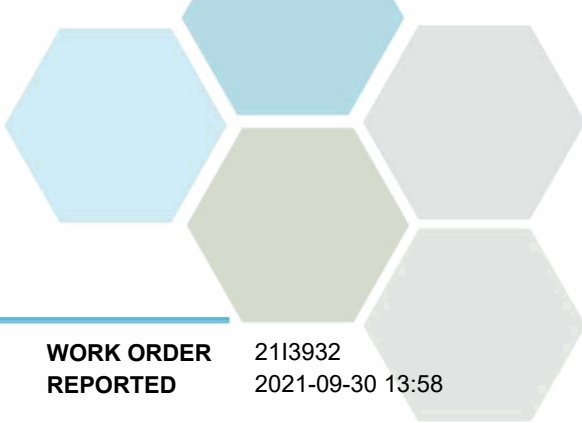
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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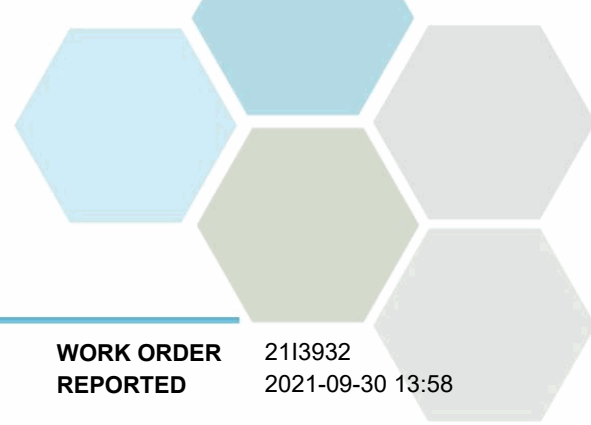


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2113932
2021-09-30 13:58

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (2113932-01) Matrix: Water Sampled: 2021-09-28 11:10					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-09-29	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-09-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2113932
2021-09-30 13:58

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2113936
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-29 12:00 / 10.1°C
PO NUMBER	OK Falls WW	COC NUMBER	B095389
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

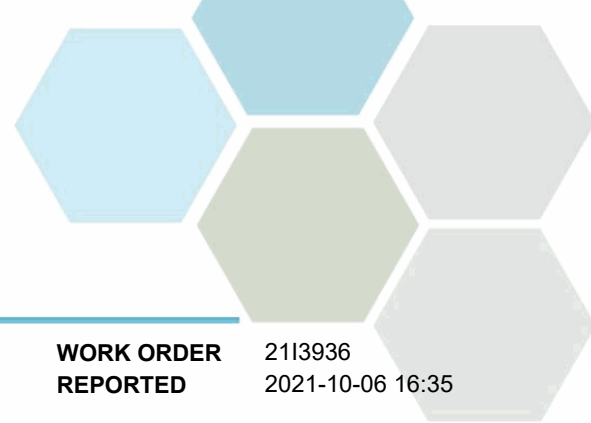
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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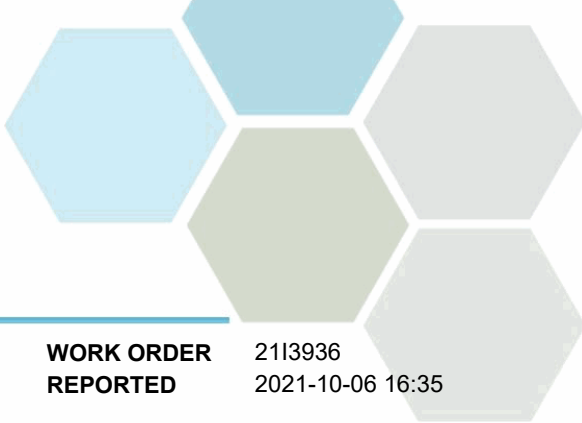


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2113936
2021-10-06 16:35

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (2113936-01) Matrix: Fresh Water Sampled: 2021-09-28 11:10					
Anions					
Nitrate (as N)	1.85	0.010	mg/L	2021-10-01	
Nitrite (as N)	0.246	0.010	mg/L	2021-10-01	
Phosphate (as P)	0.0339	0.0050	mg/L	2021-10-01	
General Parameters					
Ammonia, Total (as N)	0.461	0.050	mg/L	2021-10-01	
Chemical Oxygen Demand	20	20	mg/L	2021-10-05	
Phosphorus, Total (as P)	0.148	0.0050	mg/L	2021-10-06	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-10-05	
UV Transmittance @ 254nm	68.0	0.10	% T	2021-10-01	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 2113936
2021-10-06 16:35

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J0504
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-05 12:40 / 4.8°C 2021-10-08 17:02
PO NUMBER	OK Falls WW	COC NUMBER	B095386
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

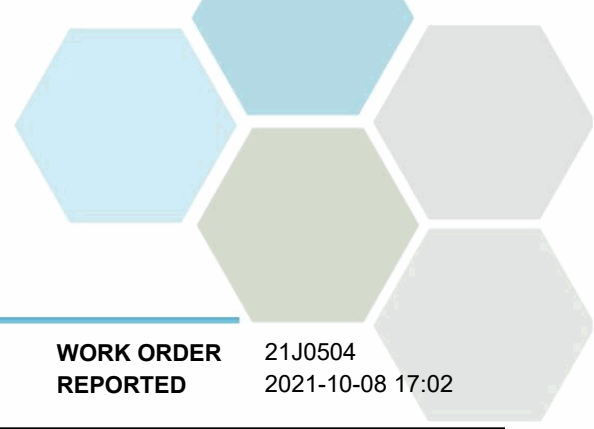
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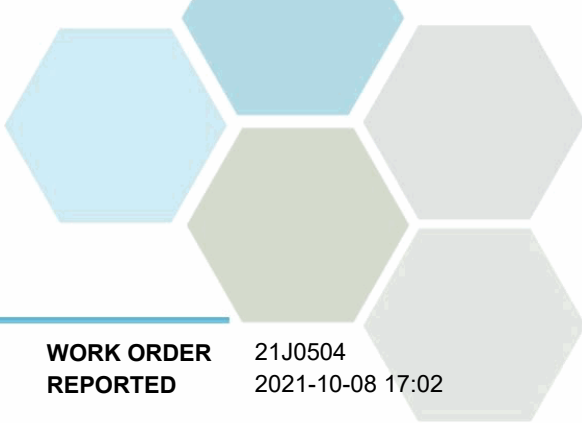


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J0504
2021-10-08 17:02

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21J0504-01) Matrix: Water Sampled: 2021-10-04 10:40					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-10-05	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-10-05	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J0504
2021-10-08 17:02

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J0506
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-05 12:40 / 4.8°C 2021-10-13 15:22
PO NUMBER	OK Falls WW	COC NUMBER	B095386
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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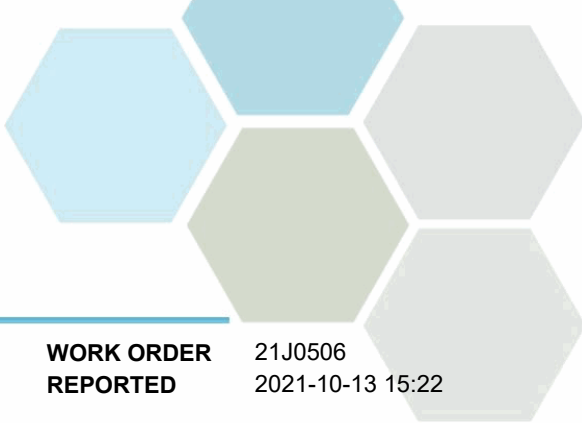
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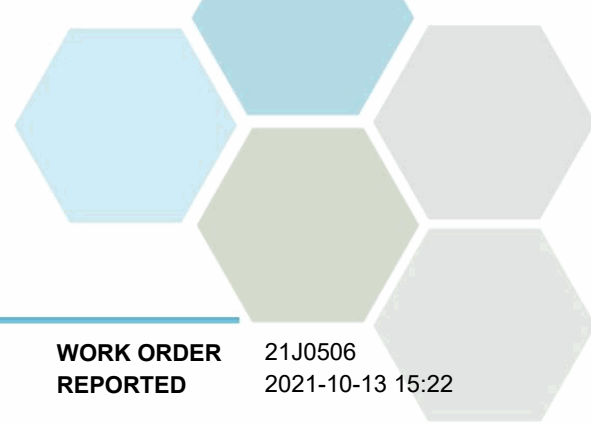


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J0506
2021-10-13 15:22

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21J0506-01) Matrix: Fresh Water Sampled: 2021-10-04 10:40					
<i>Anions</i>					
Nitrate (as N)	2.38	0.010	mg/L	2021-10-07	
Nitrite (as N)	0.257	0.010	mg/L	2021-10-07	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-10-07	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.309	0.050	mg/L	2021-10-07	
Chemical Oxygen Demand	51	20	mg/L	2021-10-07	
Phosphorus, Total (as P)	0.110	0.0050	mg/L	2021-10-12	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-10-08	
UV Transmittance @ 254nm	66.3	0.10	% T	2021-10-06	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J0506
2021-10-13 15:22

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

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% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J1849
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-14 12:01 / 6.1°C 2021-10-18 14:39
PO NUMBER	OK Falls WW	COC NUMBER	B095388
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

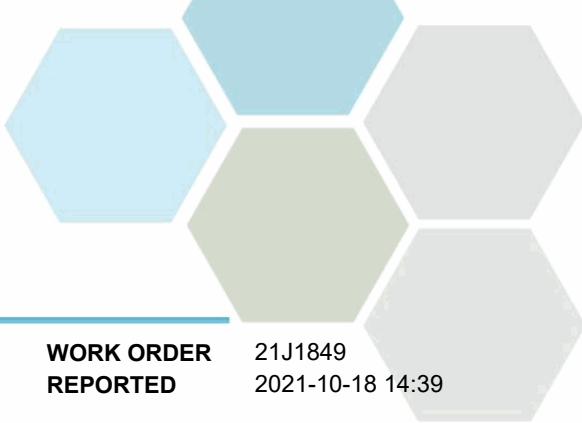
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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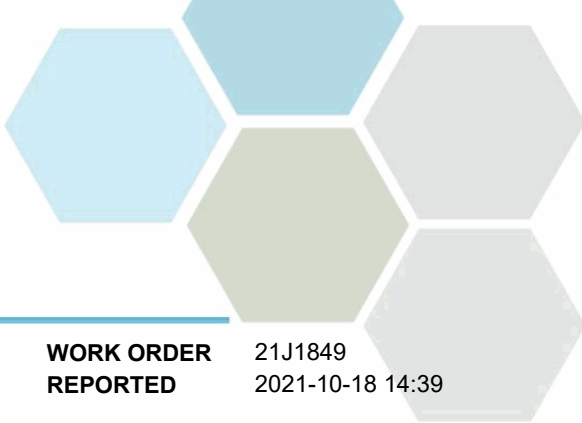


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J1849
2021-10-18 14:39

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21J1849-01) Matrix: Water Sampled: 2021-10-13 11:45					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-10-14	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-10-14	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J1849
2021-10-18 14:39

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J1855
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-14 12:01 / 6.1°C 2021-10-22 15:38
PO NUMBER	OK Falls WW	COC NUMBER	B095388
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

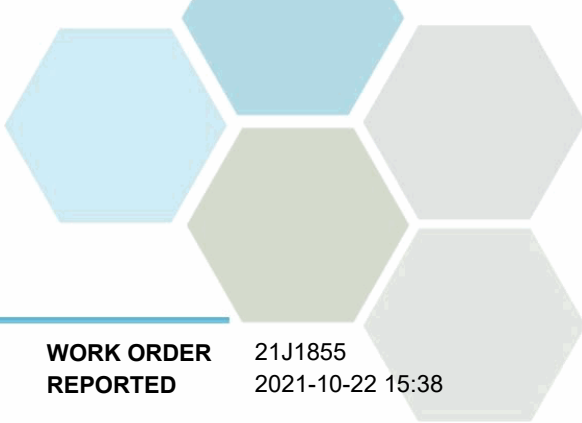
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

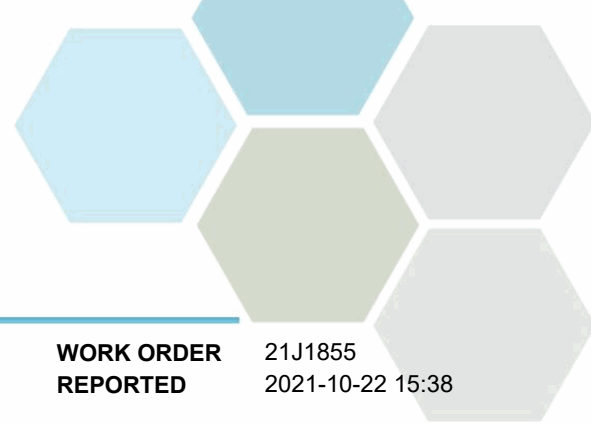
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J1855
2021-10-22 15:38

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21J1855-01) Matrix: Fresh Water Sampled: 2021-10-13 11:45					
Anions					
Nitrate (as N)	1.79	0.010	mg/L	2021-10-16	
Nitrite (as N)	0.261	0.010	mg/L	2021-10-16	
Phosphate (as P)	0.0148	0.0050	mg/L	2021-10-16	
General Parameters					
Ammonia, Total (as N)	0.286	0.050	mg/L	2021-10-16	
Chemical Oxygen Demand	29	20	mg/L	2021-10-21	
Phosphorus, Total (as P)	0.0921	0.0050	mg/L	2021-10-22	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-10-19	
UV Transmittance @ 254nm	68.1	0.10	% T	2021-10-18	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J1855
2021-10-22 15:38

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J2667
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-20 12:30 / 11.1°C 2021-10-25 14:32
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP QCE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

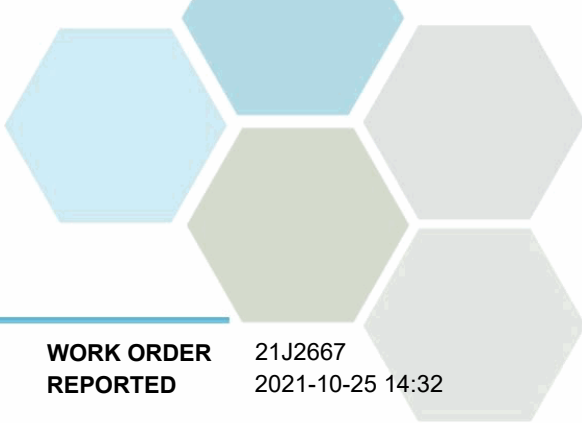
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Authorized By:

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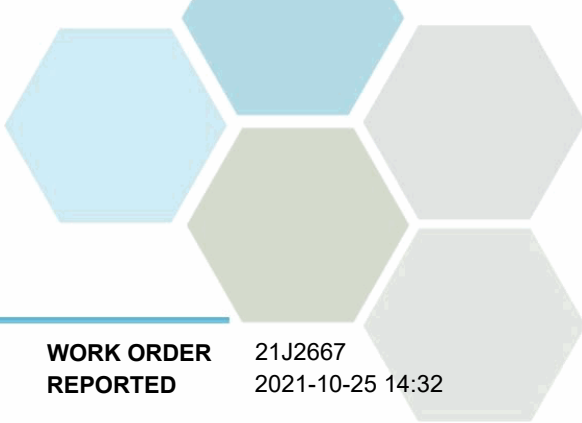


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2667
2021-10-25 14:32

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21J2667-01) Matrix: Water Sampled: 2021-10-19 10:30					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-10-20	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-10-20	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2667
2021-10-25 14:32

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J2669
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-20 12:30 / 11.1°C 2021-10-28 15:18
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP QCE		
PROJECT INFO			

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Work Order Comments:

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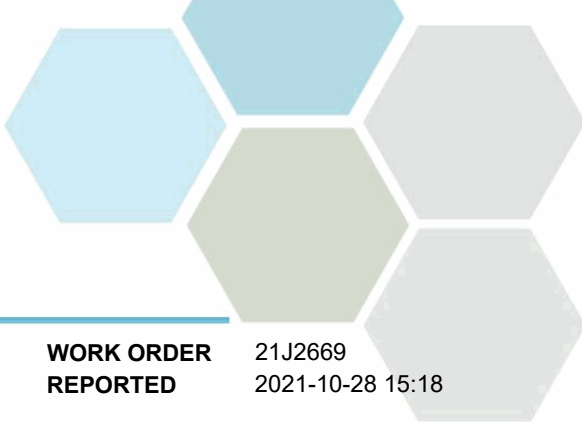
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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2669
2021-10-28 15:18

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21J2669-01) Matrix: Water Sampled: 2021-10-19 10:30					FILT, PRES

Anions

Chloride	128	0.10	mg/L	2021-10-24	
Fluoride	0.19	0.10	mg/L	2021-10-24	
Nitrate (as N)	1.55	0.010	mg/L	2021-10-24	HT1
Nitrite (as N)	0.222	0.010	mg/L	2021-10-24	HT1
Phosphate (as P)	0.0263	0.0050	mg/L	2021-10-24	HT1
Sulfate	50.7	1.0	mg/L	2021-10-24	

Calculated Parameters

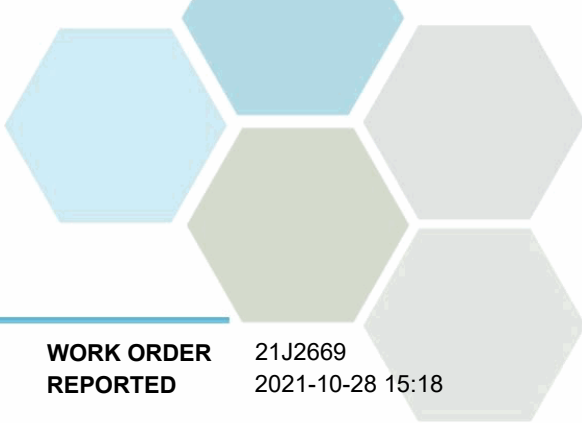
Hardness, Total (as CaCO3)	229	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	1.77	0.0100	mg/L	N/A	
Nitrogen, Total	3.74	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	257	1.0	mg/L	2021-10-21	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-10-21	
Alkalinity, Bicarbonate (as CaCO3)	257	1.0	mg/L	2021-10-21	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-10-21	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-10-21	
Ammonia, Total (as N)	0.498	0.050	mg/L	2021-10-25	
BOD, 5-day	1.5	2.0	mg/L	2021-10-26	
BOD, 5-day Carbonaceous	2.2	2.0	mg/L	2021-10-26	
Chemical Oxygen Demand	20	20	mg/L	2021-10-24	
Conductivity (EC)	954	2.0	µS/cm	2021-10-21	
Nitrogen, Total Kjeldahl	1.97	0.050	mg/L	2021-10-24	
pH	7.74	0.10	pH units	2021-10-21	HT2
Phosphorus, Total (as P)	0.123	0.0050	mg/L	2021-10-28	
Phosphorus, Total Dissolved	0.0912	0.0050	mg/L	2021-10-28	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-10-26	
UV Transmittance @ 254nm	66.8	0.10	% T	2021-10-21	

Total Metals

Aluminum, total	0.0173	0.0050	mg/L	2021-10-26	
Antimony, total	0.00030	0.00020	mg/L	2021-10-26	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-10-26	
Barium, total	0.0740	0.0050	mg/L	2021-10-26	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-10-26	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-10-26	
Boron, total	0.235	0.0500	mg/L	2021-10-26	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-10-26	
Calcium, total	70.2	0.20	mg/L	2021-10-26	
Chromium, total	< 0.00050	0.00050	mg/L	2021-10-26	
Cobalt, total	0.00014	0.00010	mg/L	2021-10-26	
Copper, total	0.00215	0.00040	mg/L	2021-10-26	
Iron, total	0.042	0.010	mg/L	2021-10-26	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2669
2021-10-28 15:18

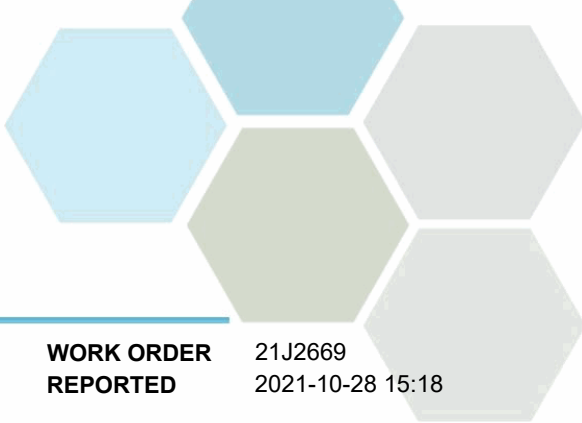
Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21J2669-01) Matrix: Water Sampled: 2021-10-19 10:30, Continued					FILT, PRES

Total Metals, Continued

Lead, total	< 0.00020	0.00020	mg/L	2021-10-26	
Lithium, total	0.00658	0.00010	mg/L	2021-10-26	
Magnesium, total	13.0	0.010	mg/L	2021-10-26	
Manganese, total	0.0462	0.00020	mg/L	2021-10-26	
Mercury, total	< 0.000010	0.000010	mg/L	2021-10-27	
Molybdenum, total	0.00127	0.00010	mg/L	2021-10-26	
Nickel, total	0.00156	0.00040	mg/L	2021-10-26	
Phosphorus, total	0.130	0.050	mg/L	2021-10-26	
Potassium, total	18.7	0.10	mg/L	2021-10-26	
Selenium, total	< 0.00050	0.00050	mg/L	2021-10-26	
Silicon, total	10.4	1.0	mg/L	2021-10-26	
Silver, total	< 0.000050	0.000050	mg/L	2021-10-26	
Sodium, total	96.9	0.10	mg/L	2021-10-26	
Strontium, total	0.540	0.0010	mg/L	2021-10-26	
Sulfur, total	16.6	3.0	mg/L	2021-10-26	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-10-26	
Thallium, total	< 0.000020	0.000020	mg/L	2021-10-26	
Thorium, total	< 0.00010	0.00010	mg/L	2021-10-26	
Tin, total	0.00031	0.00020	mg/L	2021-10-26	
Titanium, total	< 0.0050	0.0050	mg/L	2021-10-26	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-10-26	
Uranium, total	0.00211	0.000020	mg/L	2021-10-26	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-10-26	
Zinc, total	0.0287	0.0040	mg/L	2021-10-26	
Zirconium, total	0.00013	0.00010	mg/L	2021-10-26	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- 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.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

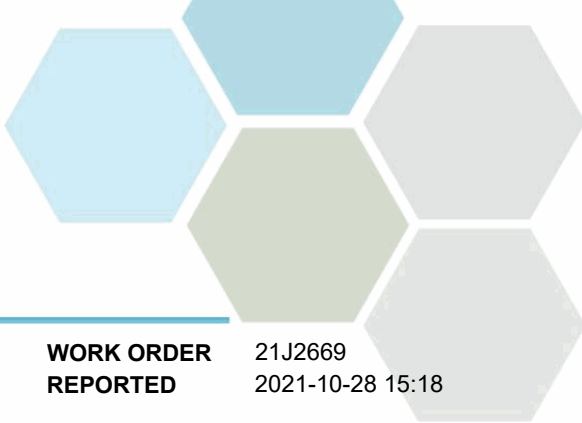
WORK ORDER REPORTED 21J2669
2021-10-28 15:18

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2669
2021-10-28 15:18

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21J3492

RECEIVED / TEMP 2021-10-26 12:10 / 4.0°C

REPORTED 2021-10-28 11:14

COC NUMBER No Number

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



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Work Order Comments:

Custody Seals Intact: N/A

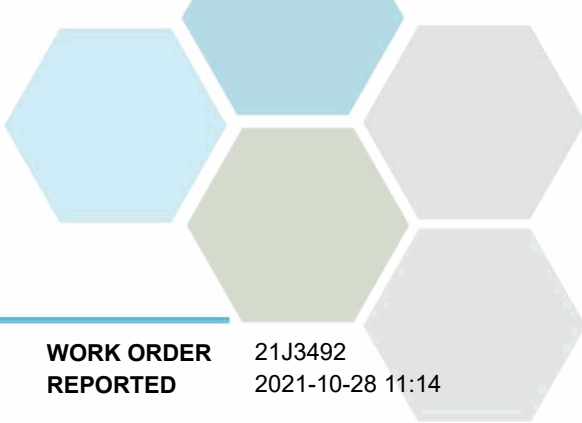
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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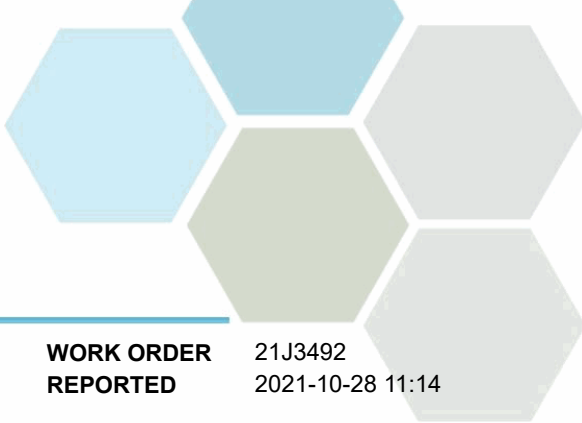


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J3492
2021-10-28 11:14

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21J3492-01) Matrix: Water Sampled: 2021-10-25 10:28					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-10-26	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-10-26	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J3492
2021-10-28 11:14

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J3495
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-26 12:10 / 4.0°C 2021-11-02 11:15
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

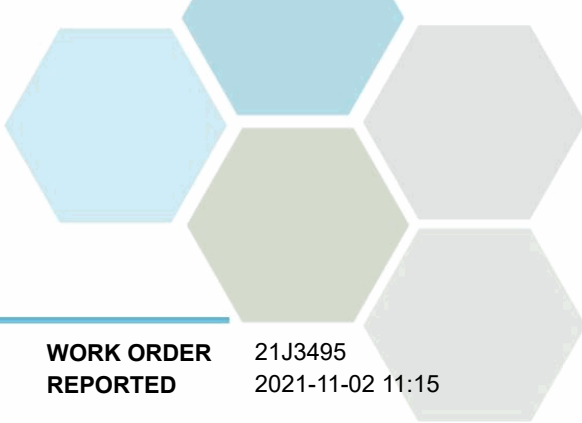
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

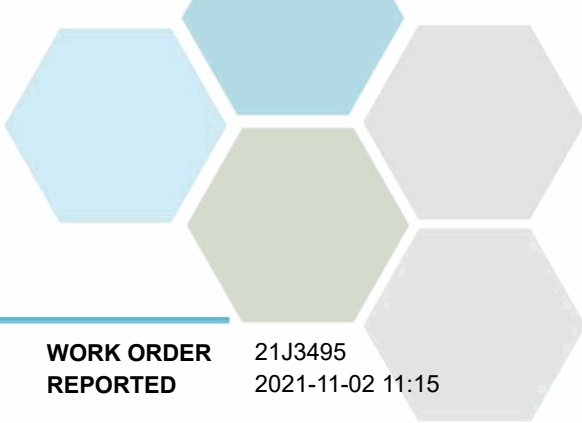
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J3495
2021-11-02 11:15

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21J3495-01) Matrix: Fresh Water Sampled: 2021-10-25 10:28					
Anions					
Nitrate (as N)	1.25	0.010	mg/L	2021-10-28	
Nitrite (as N)	0.202	0.010	mg/L	2021-10-28	
Phosphate (as P)	0.0458	0.0050	mg/L	2021-10-28	
General Parameters					
Ammonia, Total (as N)	1.28	0.050	mg/L	2021-10-29	
Chemical Oxygen Demand	26	20	mg/L	2021-10-28	
Phosphorus, Total (as P)	0.0833	0.0050	mg/L	2021-11-01	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-01	
UV Transmittance @ 254nm	66.0	0.10	% T	2021-10-29	HT1

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21J3495
2021-11-02 11:15

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K0183
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-02 11:40 / 6.1°C 2021-11-05 13:03
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

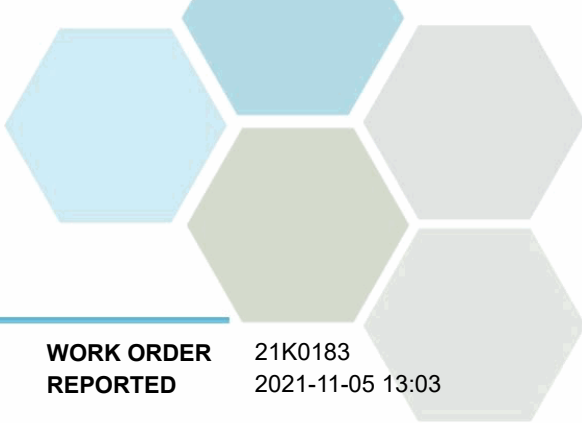
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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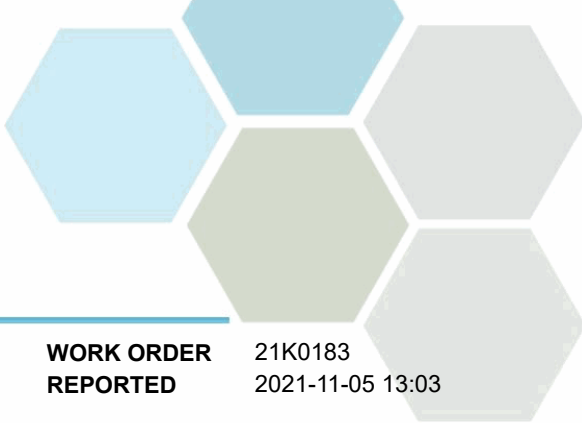


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K0183
2021-11-05 13:03

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21K0183-01) Matrix: Water Sampled: 2021-11-01 11:00					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-11-02	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-11-02	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K0183
2021-11-05 13:03

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K0186
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-02 11:40 / 6.1°C 2021-11-09 09:59
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: N/A

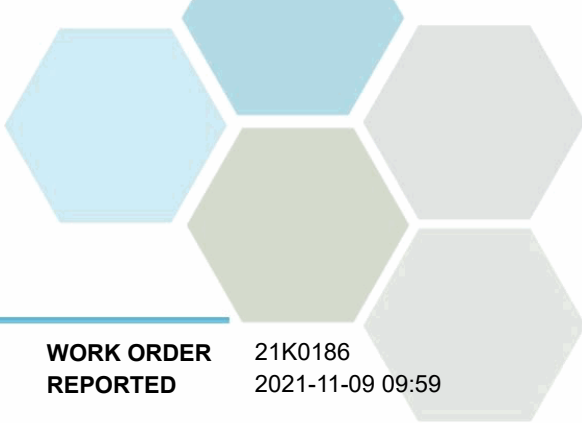
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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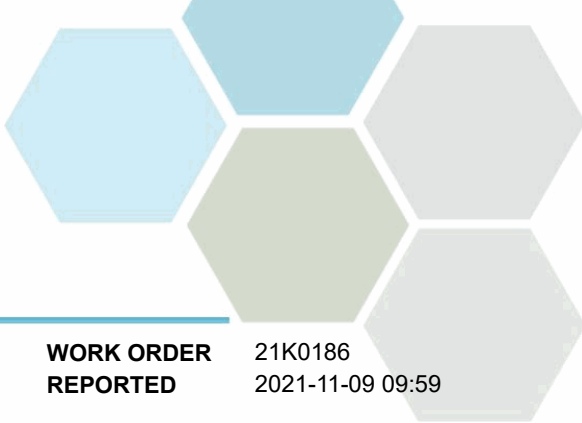


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K0186
2021-11-09 09:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21K0186-01) Matrix: Fresh Water Sampled: 2021-11-01 11:00					
<i>Anions</i>					
Nitrate (as N)	1.67	0.010	mg/L	2021-11-04	
Nitrite (as N)	0.092	0.010	mg/L	2021-11-04	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-11-04	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.983	0.050	mg/L	2021-11-04	
Chemical Oxygen Demand	31	20	mg/L	2021-11-08	
Phosphorus, Total (as P)	0.136	0.0050	mg/L	2021-11-08	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-03	
UV Transmittance @ 254nm	66.1	0.10	% T	2021-11-04	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K0186
2021-11-09 09:59

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K1269
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-09 12:00 / 4.1°C 2021-11-12 15:23
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: N/A

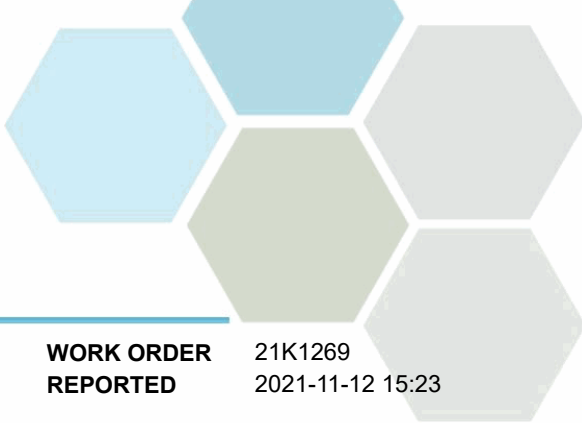
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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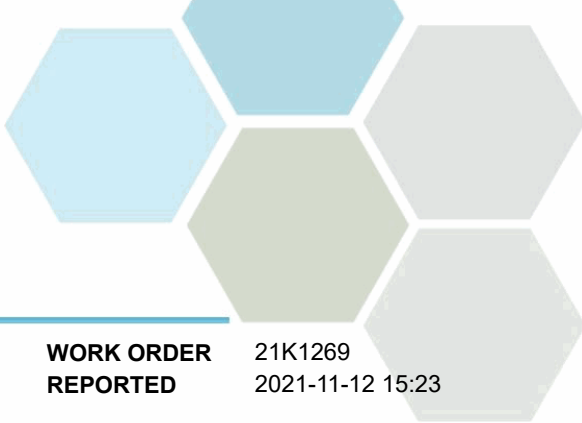


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K1269
2021-11-12 15:23

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21K1269-01) Matrix: Water Sampled: 2021-11-08 10:45					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	28	1	MPN/100 mL	2021-11-09	
E. coli (Q-Tray)	2	1	MPN/100 mL	2021-11-09	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K1269
2021-11-12 15:23

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K1272
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-09 12:00 / 4.1°C 2021-11-17 11:47
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

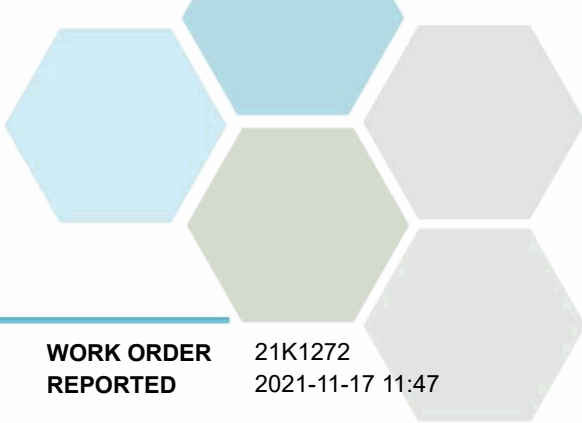
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

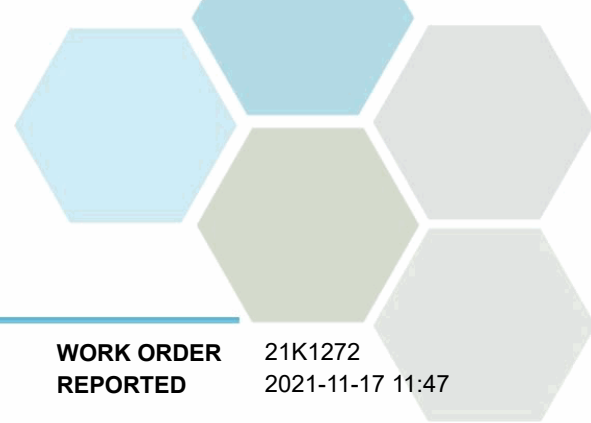
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K1272
2021-11-17 11:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21K1272-01) Matrix: Fresh Water Sampled: 2021-11-08 10:45					
Anions					
Nitrate (as N)	1.25	0.010	mg/L	2021-11-10	
Nitrite (as N)	0.084	0.010	mg/L	2021-11-10	
Phosphate (as P)	0.0325	0.0050	mg/L	2021-11-10	
General Parameters					
Ammonia, Total (as N)	0.980	0.050	mg/L	2021-11-10	
Chemical Oxygen Demand	31	20	mg/L	2021-11-13	
Phosphorus, Total (as P)	0.124	0.0050	mg/L	2021-11-10	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-16	HT1
UV Transmittance @ 254nm	67.4	0.10	% T	2021-11-10	

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K1272
2021-11-17 11:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K2051
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-16 12:00 / 6.3°C 2021-11-18 13:29
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

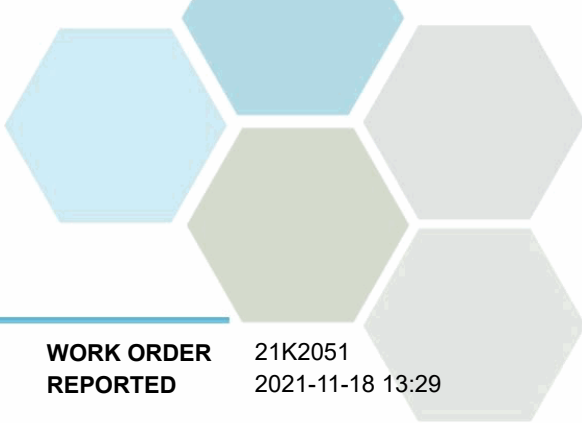
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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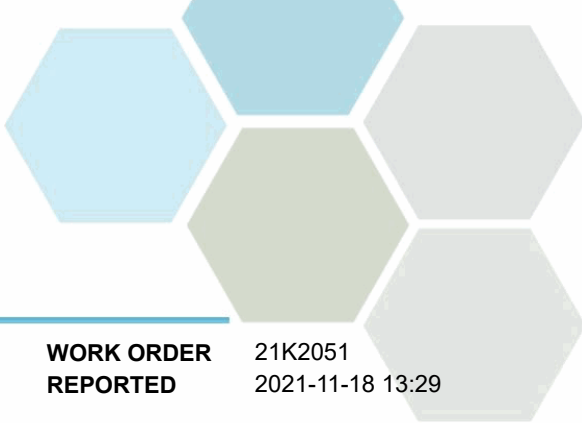


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K2051
2021-11-18 13:29

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21K2051-01) Matrix: Water Sampled: 2021-11-15 13:15					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-11-16	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-11-16	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K2051
2021-11-18 13:29

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K2053
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-16 12:00 / 6.3°C 2021-11-22 12:59
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: N/A

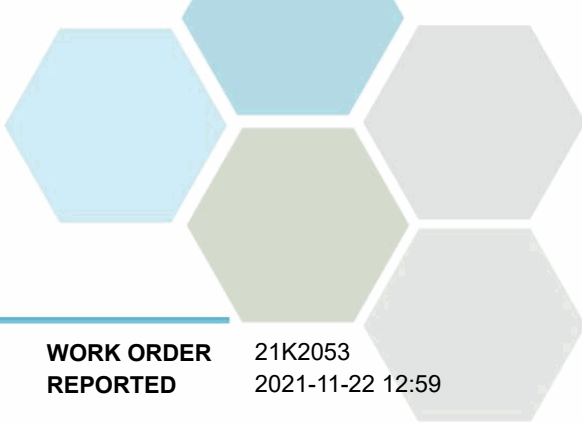
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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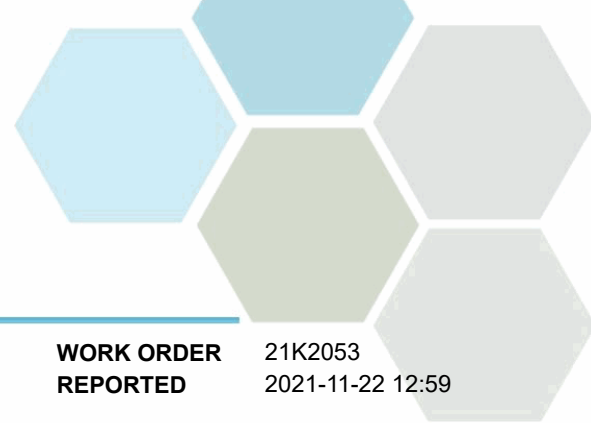


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K2053
2021-11-22 12:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21K2053-01) Matrix: Fresh Water Sampled: 2021-11-15 13:15					
Anions					
Nitrate (as N)	1.59	0.010	mg/L	2021-11-18	
Nitrite (as N)	0.100	0.010	mg/L	2021-11-18	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-11-18	
General Parameters					
Ammonia, Total (as N)	0.934	0.050	mg/L	2021-11-17	
Chemical Oxygen Demand	30	20	mg/L	2021-11-18	
Phosphorus, Total (as P)	0.144	0.0050	mg/L	2021-11-19	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-19	
UV Transmittance @ 254nm	66.1	0.10	% T	2021-11-17	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K2053
2021-11-22 12:59

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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mg/L	Milligrams per litre
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K2907
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-23 13:05 / 4.6°C 2021-11-26 10:14
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

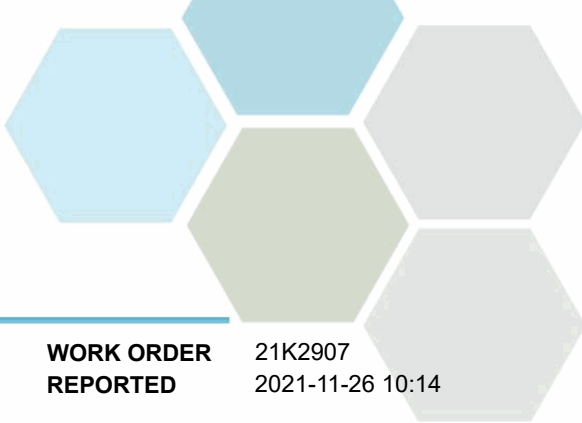
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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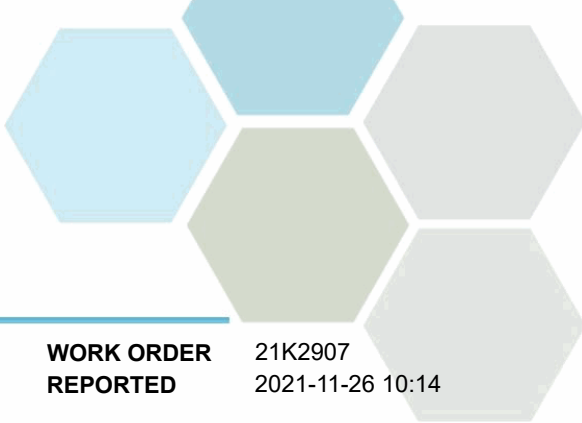


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21K2907
2021-11-26 10:14

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE Bacterial (21K2907-01) Matrix: Water Sampled: 2021-11-22 11:12					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1		1 MPN/100 mL	2021-11-23	
E. coli (Q-Tray)	1		1 MPN/100 mL	2021-11-23	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21K2907
2021-11-26 10:14

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K2909
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-23 13:05 / 4.6°C
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

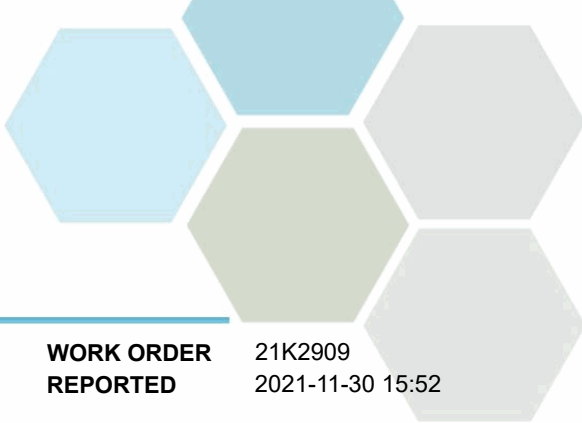
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

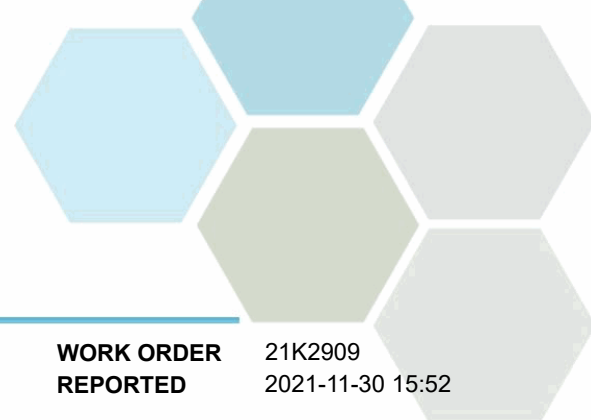
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21K2909
2021-11-30 15:52

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE (21K2909-01) Matrix: Water Sampled: 2021-11-22 11:12					FILT, PRES
Anions					
Nitrate (as N)	1.75	0.010	mg/L	2021-11-25	
Nitrite (as N)	0.106	0.010	mg/L	2021-11-25	
Phosphate (as P)	0.0056	0.0050	mg/L	2021-11-25	
Calculated Parameters					
Nitrate+Nitrite (as N)	1.86	0.0100	mg/L	N/A	
Nitrogen, Total	4.30	0.0500	mg/L	N/A	
Nitrogen, Organic	1.44	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	1.00	0.050	mg/L	2021-11-24	
BOD, 5-day Carbonaceous	5.6	2.0	mg/L	2021-11-30	
Chemical Oxygen Demand	28	20	mg/L	2021-11-30	
Nitrogen, Total Kjeldahl	2.45	0.050	mg/L	2021-11-26	
pH	7.66	0.10	pH units	2021-11-25	HT2
Phosphorus, Total (as P)	0.145	0.0050	mg/L	2021-11-29	
Phosphorus, Total Dissolved	0.108	0.0050	mg/L	2021-11-29	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-26	HT1
UV Transmittance @ 254nm	66.1	0.10	% T	2021-11-24	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- 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.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21K2909
2021-11-30 15:52

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K3794
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-30 12:00 / 5.9°C
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

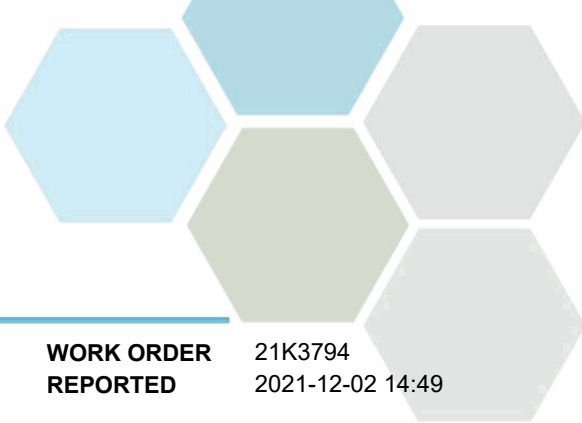
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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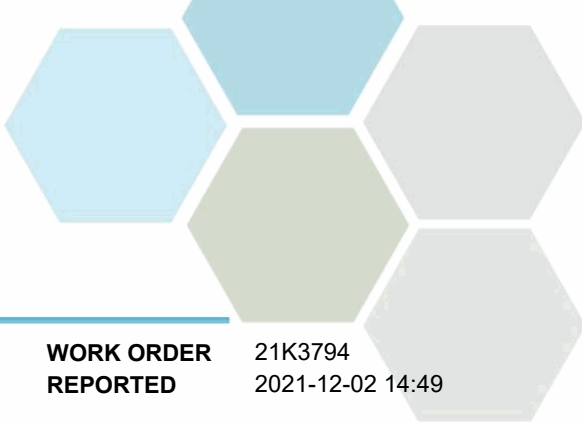


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K3794
2021-12-02 14:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21K3794-01) Matrix: Water Sampled: 2021-11-29 11:55					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-11-30	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-11-30	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K3794
2021-12-02 14:49

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21K3797

RECEIVED / TEMP 2021-11-30 12:00 / 5.9°C

REPORTED 2021-12-07 15:25

COC NUMBER No Number

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

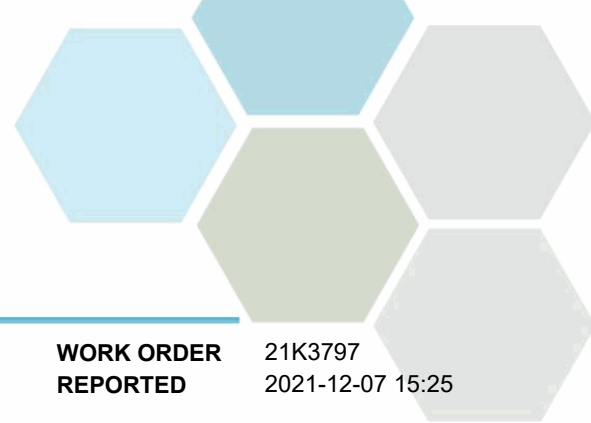
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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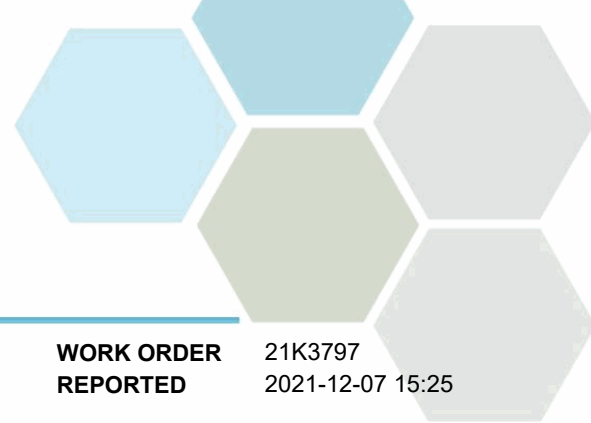


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K3797
2021-12-07 15:25

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21K3797-01) Matrix: Fresh Water Sampled: 2021-11-29 11:55					
Anions					
Nitrate (as N)	1.70	0.010	mg/L	2021-12-01	
Nitrite (as N)	0.093	0.010	mg/L	2021-12-01	
Phosphate (as P)	0.0130	0.0050	mg/L	2021-12-01	
General Parameters					
Ammonia, Total (as N)	1.92	0.050	mg/L	2021-12-01	
Chemical Oxygen Demand	29	20	mg/L	2021-12-07	
Phosphorus, Total (as P)	0.152	0.0050	mg/L	2021-12-06	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-12-02	
UV Transmittance @ 254nm	67.7	0.10	% T	2021-11-30	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21K3797
2021-12-07 15:25

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21L1225
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-12-08 13:45 / 7.0°C 2021-12-10 17:27
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

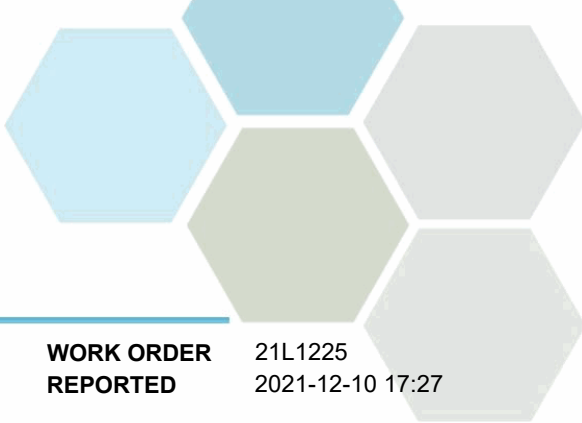
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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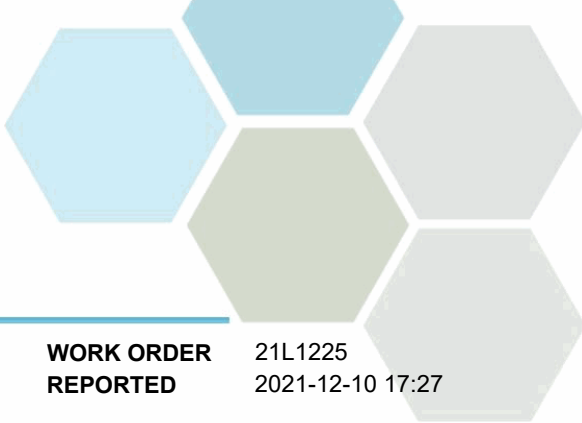


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21L1225
2021-12-10 17:27

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE Bacterial (21L1225-01) Matrix: Water Sampled: 2021-12-07 11:33					
<i>Microbiological Parameters</i>					
Coliforms, Fecal	< 1		MPN/100 mL	2021-12-08	
E. coli	< 1		MPN/100 mL	2021-12-08	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21L1225
2021-12-10 17:27

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21L1226
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-12-08 13:45 / 7.0°C
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

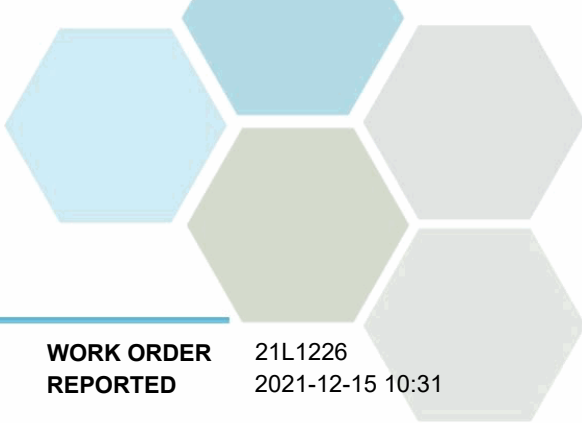
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21L1226
2021-12-15 10:31

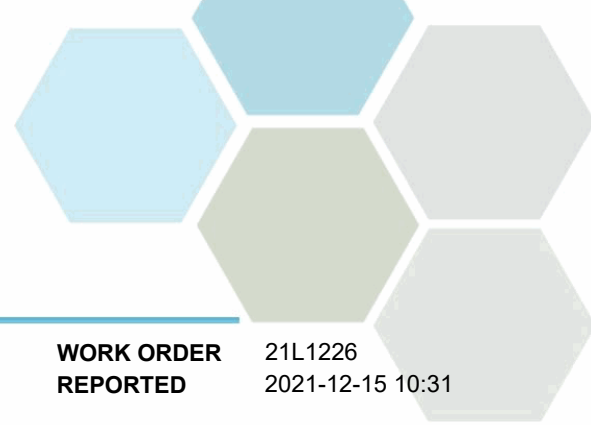
Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - MCE (21L1226-01) Matrix: Water Sampled: 2021-12-07					FILT, PRES
Anions					
Nitrate (as N)	1.44	0.010	mg/L	2021-12-09	
Nitrite (as N)	0.059	0.010	mg/L	2021-12-09	
Phosphate (as P)	0.0288	0.0050	mg/L	2021-12-09	
Calculated Parameters					
Nitrate+Nitrite (as N)	1.50	0.0100	mg/L	N/A	
Nitrogen, Total	4.18	0.0500	mg/L	N/A	
Nitrogen, Organic	1.47	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	1.21	0.050	mg/L	2021-12-10	
BOD, 5-day Carbonaceous	4.6	2.0	mg/L	2021-12-14	
Chemical Oxygen Demand	50	20	mg/L	2021-12-09	
Nitrogen, Total Kjeldahl	2.68	0.050	mg/L	2021-12-13	
pH	7.66	0.10	pH units	2021-12-08	HT2
Phosphorus, Total (as P)	0.209	0.0050	mg/L	2021-12-14	
Phosphorus, Total Dissolved	0.154	0.0050	mg/L	2021-12-14	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-12-10	
UV Transmittance @ 254nm	65.3	0.10	% T	2021-12-09	

Sample Qualifiers:

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCE

WORK ORDER REPORTED 21L1226
2021-12-15 10:31

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21L2030

RECEIVED / TEMP 2021-12-14 13:00 / 3.5°C

REPORTED 2021-12-16 14:11

COC NUMBER No Number

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

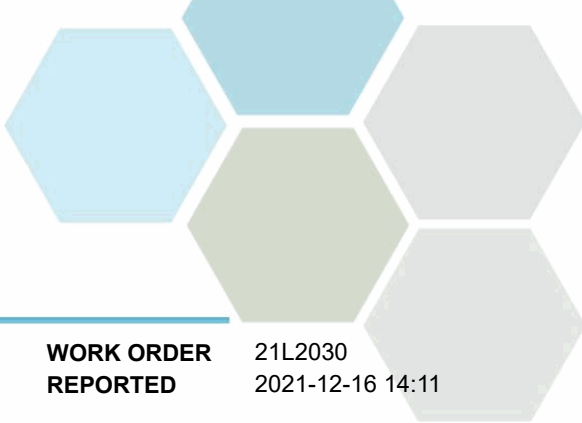
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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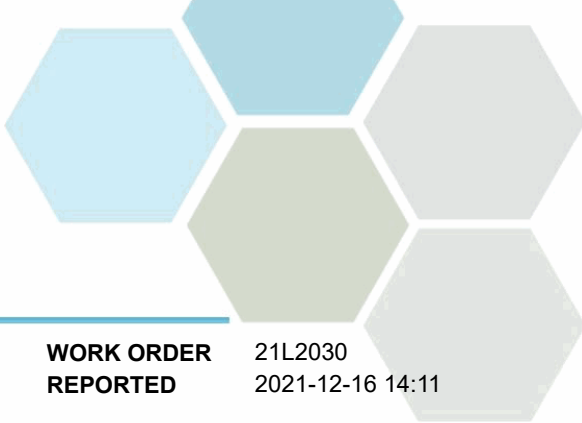


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L2030
2021-12-16 14:11

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21L2030-01) Matrix: Water Sampled: 2021-12-13 10:25					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-12-14	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-12-14	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L2030
2021-12-16 14:11

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21L2031
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-12-14 13:00 / 3.5°C 2021-12-20 14:49
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

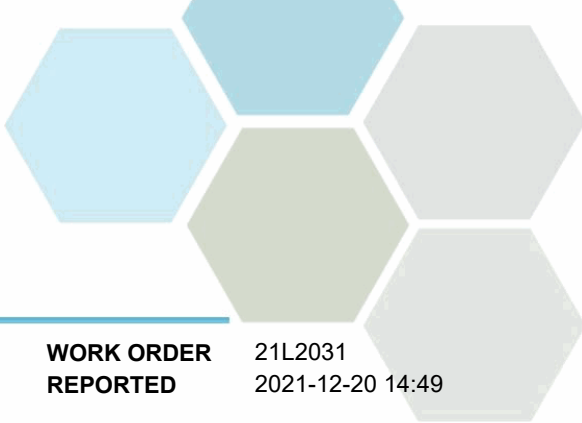
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Service Team Lead

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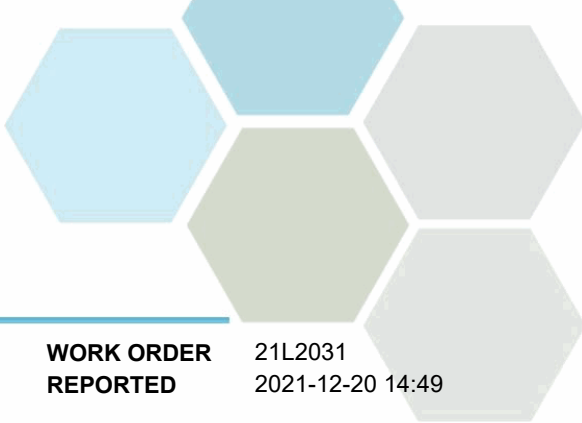


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L2031
2021-12-20 14:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21L2031-01) Matrix: Fresh Water Sampled: 2021-12-13 10:25					
<i>Anions</i>					
Nitrate (as N)	1.46	0.010	mg/L	2021-12-15	
Nitrite (as N)	0.074	0.010	mg/L	2021-12-15	
Phosphate (as P)	0.0183	0.0050	mg/L	2021-12-15	
<i>General Parameters</i>					
Ammonia, Total (as N)	1.35	0.050	mg/L	2021-12-17	
Chemical Oxygen Demand	30	20	mg/L	2021-12-15	
Phosphorus, Total (as P)	0.192	0.0050	mg/L	2021-12-19	
Solids, Total Suspended	2.6	2.0	mg/L	2021-12-18	
UV Transmittance @ 254nm	64.2	0.10	% T	2021-12-15	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L2031
2021-12-20 14:49

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
mg/L	Milligrams per litre
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21L3030
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-12-21 09:53 / 2.7°C 2021-12-22 16:21
PO NUMBER	OK Falls WW	COC NUMBER	B110629
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

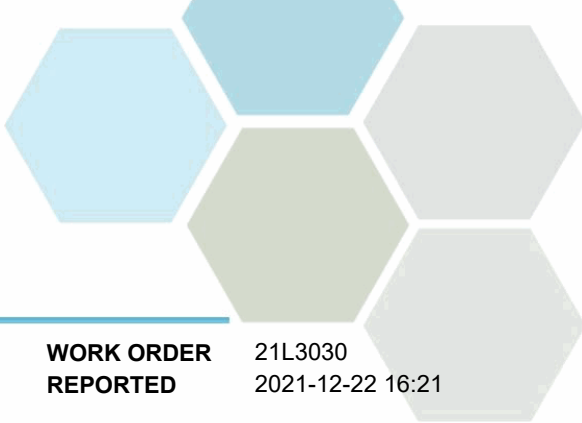
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Service Team Lead

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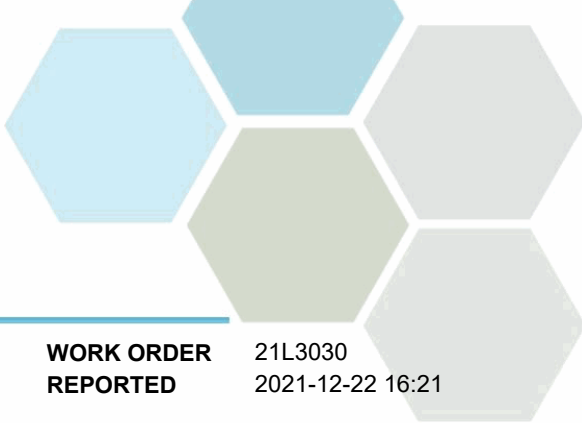


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L3030
2021-12-22 16:21

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21L3030-01) Matrix: Water Sampled: 2021-12-20 10:25					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-12-21	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-12-21	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L3030
2021-12-22 16:21

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21L3031
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-12-21 09:53 / 2.7°C
PO NUMBER	OK Falls WW	COC NUMBER	2021-12-30 15:31 B110629
PROJECT	OK Falls WWTP WAE		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

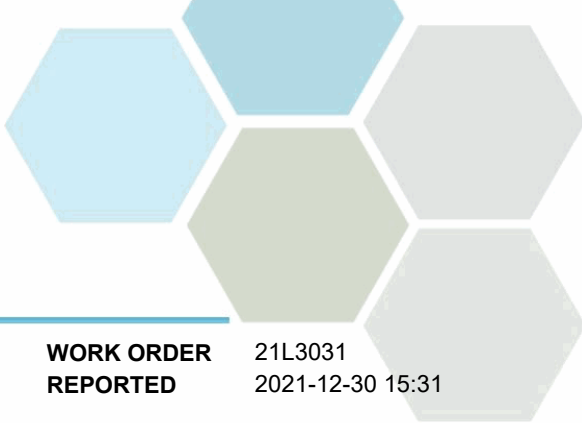
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Service Team Lead

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TEST RESULTS

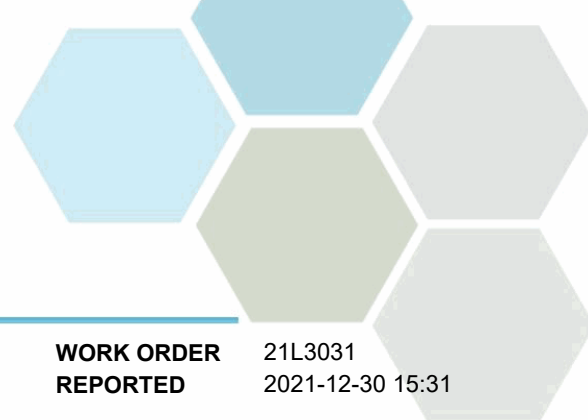
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L3031
2021-12-30 15:31

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21L3031-01) Matrix: Fresh Water Sampled: 2021-12-20					
<i>Anions</i>					
Nitrate (as N)	1.17	0.010	mg/L	2021-12-22	
Nitrite (as N)	0.044	0.010	mg/L	2021-12-22	
Phosphate (as P)	0.0456	0.0050	mg/L	2021-12-22	
<i>General Parameters</i>					
Ammonia, Total (as N)	1.56	0.050	mg/L	2021-12-22	
Chemical Oxygen Demand	32	20	mg/L	2021-12-23	
Phosphorus, Total (as P)	0.147	0.0050	mg/L	2021-12-30	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-12-30	HT1
UV Transmittance @ 254nm	66.8	0.10	% T	2021-12-21	

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L3031
2021-12-30 15:31

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	Kelowna

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

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP WAE

PROJECT INFO

WORK ORDER 21L3469

RECEIVED / TEMP REPORTED 2021-12-28 14:43 / 2.8°C
2021-12-31 10:09

COC NUMBER B110631

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

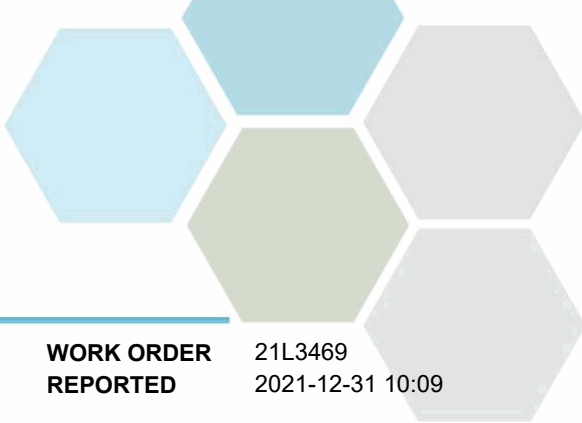
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Service Team Lead

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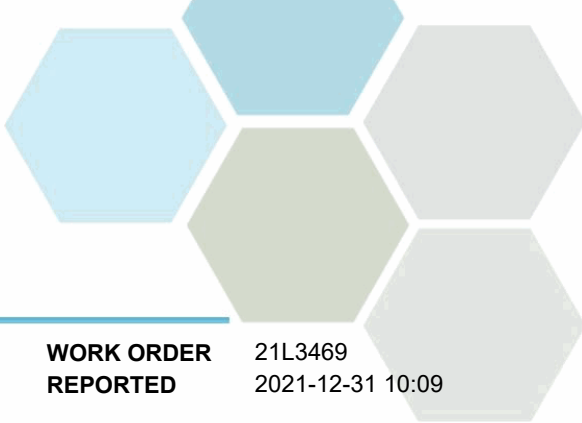


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L3469
2021-12-31 10:09

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab - Bacteria (21L3469-01) Matrix: Water Sampled: 2021-12-28 10:15					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-12-28	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-12-28	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L3469
2021-12-31 10:09

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21L3471
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-12-28 14:43 / 2.8°C
PO NUMBER	OK Falls WW	REPORTED	2022-01-04 14:18
PROJECT	OK Falls WWTP WAE	COC NUMBER	B110631
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: N/A

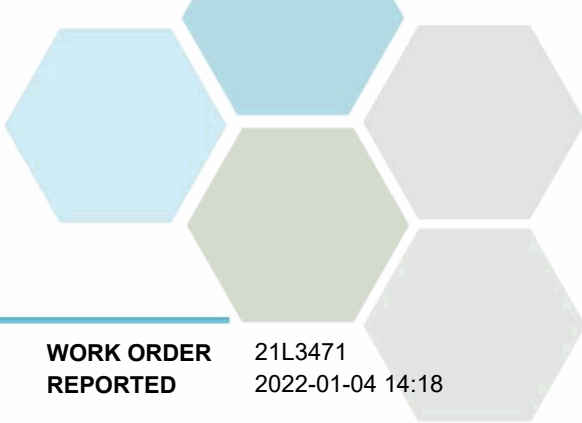
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Authorized By:

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#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

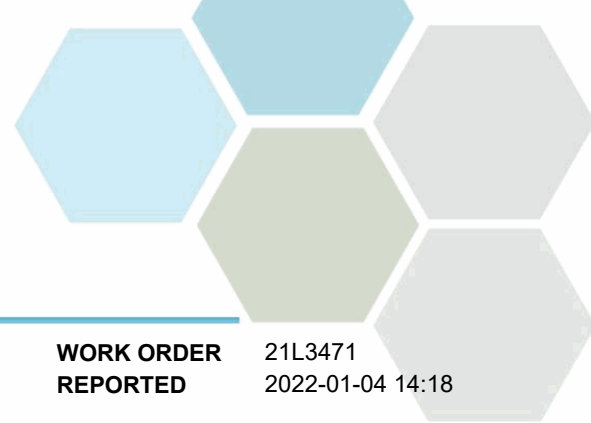
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L3471
2022-01-04 14:18

Analyte	Result	RL	Units	Analyzed	Qualifier
Effluent Grab (21L3471-01) Matrix: Fresh Water Sampled: 2021-12-28 10:15					
Anions					
Nitrate (as N)	1.25	0.010	mg/L	2021-12-29	
Nitrite (as N)	0.057	0.010	mg/L	2021-12-29	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-12-29	
General Parameters					
Ammonia, Total (as N)	3.88	0.050	mg/L	2021-12-30	
Chemical Oxygen Demand	30	20	mg/L	2021-12-30	
Phosphorus, Total (as P)	0.143	0.0050	mg/L	2022-01-04	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-01-03	HT1
UV Transmittance @ 254nm	66.0	0.10	% T	2021-12-30	

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP WAE

WORK ORDER REPORTED 21L3471
2022-01-04 14:18

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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 J

Quality Control Samples Database Summary 2021

Appendix J

Okanagan Falls Advanced Wastewater Treatment Facility - Blanks

Water Quality Results

	Analyte	Unit	Sampling Location	Field Blank	Field Blank	Field Blank	Trip Blank
			Date Sampled	20-Apr-21	20-Apr-21	20-Apr-21	05-Aug-21
			Client Sample ID	Field Blank - Influent	Field Blank - Effluent	Field Blank - Okanagan River 100m D/S	Trip Blank - Vaseux Lake
			Lab Sample ID	21D2269-02	21D2207-02	21D2209-03	21H0575-03
	Sample Type		Field Blank	Field Blank	Field Blank	Trip Blank	
Field Results							
	Conductivity	µS/cm			4.0		
	Dissolved oxygen	mg/L			7.79		
	Oxidation reduction potential	mV			40.2		
	pH				8.4		
	Temperature	°C			18.6		
	Total dissolved solids	mg/L			2.6		
Lab Results							
General							
	Alkalinity (bicarbonate, as CaCO3)	mg/L		<1.0	<1.0		
	Alkalinity (carbonate, as CaCO3)	mg/L		<1.0	<1.0		
	Alkalinity (hydroxide, as CaCO3)	mg/L		<1.0	<1.0		
	Alkalinity (phenolphthalein, as CaCO3)	mg/L		<1.0	<1.0		
	Alkalinity (total, as CaCO3)	mg/L		<1.0	<1.0		
	Biochemical oxygen demand	mg/L	<1.4	<1.3	<1.3		
	5-d Carbonaceous BOD	mg/L		<1.3			
	Chemical Oxygen Demand	mg/L		<20	<5		
	Chloride	mg/L		<0.10	<0.10	<0.10	
	Chlorophyll a	mg/L				<0.00100	
	Conductivity	µS/cm		<2.0	<2.0		
	Fluoride	mg/L		<0.10	<0.10		
	Hardness, Total (total as CaCO3)	mg/L		<0.500	<0.500	<0.500	
	pH		6.24	5.50	5.63		
	Sulphate	mg/L		<1.0	<1.0	<1.0	
	Total suspended solids	mg/L		<2.0	<4.0		
	UV transmittance at 254 nm - filtered	%		100			
Nutrients							
	Ammonia (total, as N)	mg/L	<0.050	<0.050	<0.050	<0.020	
	Nitrate (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	
	Nitrate + Nitrite (as N)	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	
	Nitrate + Nitrite (as N) (calculated)	mg/L	<0.014	<0.014	<0.014	<0.014	
	Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	
	Total nitrogen	mg/L	<0.0500	<0.0500	<0.0500	<0.0500	
	Total kjeldahl nitrogen	mg/L	<0.050	<0.050	<0.050	<0.050	
	Total organic nitrogen	mg/L				<0.0500	
	Orthophosphate (dissolved, as P)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	
	Phosphorus (total, by ICPMS/ICPOES)	mg/L		<0.050	<0.050	<0.050	
	Phosphorus (total, APHA 4500-P)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	
	Phosphorus (dissolved, APHA 4500-P)	mg/L		<0.0050	<0.0050		
	Potassium (total)	mg/L		<0.10	<0.10	<0.10	

Water Quality Results

	Analyte	Unit	Sampling Location	Field Blank	Field Blank	Field Blank	Trip Blank
			Date Sampled	20-Apr-21	20-Apr-21	20-Apr-21	05-Aug-21
			Client Sample ID	Field Blank - Influent	Field Blank - Effluent	Field Blank - Okanagan River 100m D/S	Trip Blank - Vaseux Lake
			Lab Sample ID	21D2269-02	21D2207-02	21D2209-03	21H0575-03
	Sample Type		Field Blank	Field Blank	Field Blank	Trip Blank	
Total Metals							
Aluminum (total)	mg/L			<0.0050	<0.0050	0.007	
Antimony (total)	mg/L			<0.00020	<0.00020	<0.00020	
Arsenic (total)	mg/L			<0.00050	<0.00050	<0.00050	
Barium (total)	mg/L			<0.0050	<0.0050	<0.0050	
Beryllium (total)	mg/L			<0.00010	<0.00010	<0.00010	
Bismuth (total)	mg/L			<0.00010	<0.00010	<0.00010	
Boron (total)	mg/L			<0.0500	<0.0500	<0.0500	
Cadmium (total)	mg/L			<0.000010	<0.000010	<0.000010	
Calcium (total)	mg/L			<0.20	<0.20	<0.20	
Chromium (total)	mg/L			<0.00050	<0.00050	<0.00050	
Cobalt (total)	mg/L			<0.00010	<0.00010	<0.00010	
Copper (total)	mg/L			0.00055	<0.00040	<0.00040	
Iron (total)	mg/L			<0.010	<0.010	<0.010	
Lead (total)	mg/L			<0.00020	<0.00020	<0.00020	
Lithium (total)	mg/L			<0.00010	<0.00010	<0.00010	
Magnesium (total)	mg/L			<0.010	<0.010	<0.010	
Manganese (total)	mg/L			<0.00020	<0.00020	<0.00020	
Mercury (total)	mg/L			<0.000010	<0.000010		
Molybdenum (total)	mg/L			<0.00010	0.00018	<0.00010	
Nickel (total)	mg/L			<0.00040	<0.00040	<0.00040	
Selenium (total)	mg/L			<0.00050	<0.00050	<0.00050	
Silicon (total, as Si)	mg/L			<1.0	<1.0	<1.0	
Silver (total)	mg/L			<0.000050	<0.000050	<0.000050	
Sodium (total)	mg/L			<0.10	<0.10	<0.10	
Strontium (total)	mg/L			<0.0010	<0.0010	<0.0010	
Sulphur (total)	mg/L			<3.0	<3.0	<3.0	
Tellurium (total)	mg/L			<0.00050	<0.00050	<0.00050	
Thallium (total)	mg/L			<0.000020	<0.000020	<0.000020	
Thorium (total)	mg/L			<0.00010	<0.00010	<0.00010	
Tin (total)	mg/L			<0.00020	<0.00020	<0.00020	
Titanium (total)	mg/L			<0.0050	<0.0050	<0.0050	
Tungsten (total)	mg/L			<0.0010	<0.0010	<0.0010	
Uranium (total)	mg/L			<0.000020	<0.000020	<0.000020	
Vanadium (total)	mg/L			<0.0010	<0.0010	<0.0010	
Zinc (total)	mg/L			<0.0040	<0.0040	<0.0040	
Zirconium (total)	mg/L			<0.00010	<0.00010	<0.00010	



Okanagan Falls Advanced Wastewater Treatment Facility

Duplicate Water Samples Report

		Sampling Location	Influent	Influent	Influent	
		Date Sampled	21-Jul-21	21-Jul-21	21-Jul-21	
		Lab Sample ID	21G2783-01	21G2783-02	21G2783-03	
		Sample Type	Normal	Duplicate	Duplicate	
Analyte	Unit					Relative Standard Deviation
Field Results						
pH			7.55			
Temperature	°C		19.3			
Lab Results						
General						
Biochemical oxygen demand	mg/L		208	231	193	9.1%
pH			7.68	7.67	7.68	0.1%
Nutrients						
Ammonia (total, as N)	mg/L		37.6	40.2	38.1	3.6%
Nitrate (as N)	mg/L		<0.010	<0.010	<0.010	
Nitrite (as N)	mg/L		<0.010	<0.010	<0.010	
Total nitrogen	mg/L		57.7	49	47.8	10.5%
Total kjeldahl nitrogen	mg/L		57.7	49	47.8	10.5%
Orthophosphate (dissolved, as P)	mg/L		3.98	4.08	3.44	9.0%
Phosphorus (total, APHA 4500-P)	mg/L		7.14	7.33	6.54	5.9%



Okanagan Falls Advanced Wastewater Treatment Facility

Duplicate Soil Samples Report

		Fermented Primary Sludge (FPS)	Fermented Primary Sludge (FPS)	Fermented Primary Sludge (FPS)		Thickened Waste Activated Sludge (TWAS)	Thickened Waste Activated Sludge (TWAS)	Thickened Waste Activated Sludge (TWAS)	
Sampling Location									
Date Sampled	20-Jul-21	20-Jul-21	20-Jul-21			20-Jul-21	20-Jul-21	20-Jul-21	
Lab Sample ID	21G2746-01	21G2746-02	21G2746-03	Relative Standard Deviation		21G2746-04	21G2746-05	21G2746-06	Relative Standard Deviation
Sample Type	Normal	Duplicate	Duplicate			Normal	Duplicate	Duplicate	
Analyte	Unit								
Lab Results									
General									
Percent solids	% wet	8.6	10.8	9	12.4%	2.3	2.3	2.2	2.5%
Total volatile solids (percent)	% dry	86.6	87	87.1	0.3%	77.7	77.4	77.3	0.3%
Metals									
Arsenic	µg/g	3.88	3.77	3.86	1.5%	2.59	2.76	2.69	3.2%
Cadmium	µg/g	0.889	0.919	0.817	6.0%	0.854	0.949	0.907	5.3%
Chromium	µg/g	17.3	17.7	350	149.6%	8.3	9.2	8.8	5.1%
Cobalt	µg/g	0.98	0.91	1.35	21.9%	1.12	1.12	1.14	1.0%
Copper	µg/g	245	228	240	3.7%	256	275	266	3.6%
Lead	µg/g	10.5	10.1	12	9.2%	7.97	8.28	8.47	3.1%
Mercury	µg/g	0.466	0.583	0.406	18.6%	0.206	0.236	0.226	6.9%
Molybdenum	µg/g	8.48	8.53	8.84	2.3%	7.5	8.07	7.74	3.7%
Nickel	µg/g	10.6	11.5	11.7	5.2%	9.56	10.4	9.9	4.2%
Selenium	µg/g	4.48	4.78	4.46	3.9%	7.56	7.93	8.24	4.3%
Zinc	µg/g	714	713	724	0.8%	568	608	593	3.4%



Duplicate Water Samples Report

Sampling Location		OK Falls AWWTP	OK Falls AWWTP	OK Falls AWWTP	Relative Standard Deviation
		Treated Effluent	Treated Effluent	Treated Effluent	
Date Sampled		21-Jul-21	21-Jul-21	21-Jul-21	
Lab Sample ID for analyses except bacteriological		21G2724-01	21G2724-02	21G2733-01	
Lab Sample ID for Bacteriological samples		21G2722-01	21G2731-01	21G2722-02	
Sample Type		Normal	Duplicate	Duplicate	
Analyte	Unit				
Lab Results					
General					
Alkalinity (bicarbonate, as CaCO ₃)	mg/L	248	249	246	0.6%
Alkalinity (carbonate, as CaCO ₃)	mg/L	<1.0	<1.0	<1.0	
Alkalinity (hydroxide, as CaCO ₃)	mg/L	<1.0	<1.0	<1.0	
Alkalinity (phenolphthalein, as CaCO ₃)	mg/L	<1.0	<1.0	<1.0	
Alkalinity (total, as CaCO ₃)	mg/L	248	249	246	0.6%
Biochemical oxygen demand	mg/L	<1.0	<1.0	<1.0	
5-d Carbonaceous BOD	mg/L	<1.0	<1.0	<5.3	
Chemical Oxygen Demand	mg/L	21	21	22	2.7%
Chloride	mg/L	122	122	118	1.9%
Conductivity	µS/cm	918	919	925	0.4%
Fluoride	mg/L	0.14	0.14	0.16	7.9%
Hardness, Total (total as CaCO ₃)	mg/L	245	257	253	2.4%
pH		7.89	7.87	7.97	0.7%
Sulphate	mg/L	49.4	46.6	46.7	3.3%
Total suspended solids	mg/L	<2.0	<2.0	<4.0	
UV transmittance at 254 nm - filtered	%	70.9	71	71.1	0.1%
Microbiological					
E. coli (MPN)	MPN/100 mL	1	<1	<1	
Fecal coliforms (MPN)	MPN/100 mL	1	<1	<1	
Nutrients					
Ammonia (total, as N)	mg/L	0.149	0.167	0.167	6.5%
Nitrate (as N)	mg/L	2.27	2.28	2.28	0.3%
Nitrite (as N)	mg/L	0.025	0.025	0.026	2.3%
Total nitrogen	mg/L	3.36	3.42	3.39	0.9%
Total kjeldahl nitrogen	mg/L	1.07	1.12	1.08	2.4%
Orthophosphate (dissolved, as P)	mg/L	0.0406	0.0436	0.05	10.7%
Phosphorus (total, by ICPMS/ICPOES)	mg/L	0.135	0.162	0.197	18.9%
Phosphorus (total, APHA 4500-P)	mg/L	0.149	0.152	0.152	1.1%
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.14	0.138	0.135	1.8%
Potassium (total)	mg/L	19.3	19.9	19.4	1.6%

Duplicate Water Samples Report

Sampling Location		OK Falls AWWTP	OK Falls AWWTP	OK Falls AWWTP	Relative Standard Deviation
		Treated Effluent	Treated Effluent	Treated Effluent	
Date Sampled		21-Jul-21	21-Jul-21	21-Jul-21	
Lab Sample ID for analyses except bacteriological		21G2724-01	21G2724-02	21G2733-01	
Lab Sample ID for Bacteriological samples		21G2722-01	21G2731-01	21G2722-02	
Sample Type		Normal	Duplicate	Duplicate	
Analyte	Unit				
Total Metals					
Aluminum (total)	mg/L	0.0288	0.0272	0.0651	53.1%
Antimony (total)	mg/L	0.00026	<0.00020	<0.00020	
Arsenic (total)	mg/L	<0.00050	<0.00050	<0.00050	
Barium (total)	mg/L	0.054	0.0511	0.0507	3.5%
Beryllium (total)	mg/L	<0.00010	<0.00010	<0.00010	
Bismuth (total)	mg/L	<0.00010	<0.00010	<0.00010	
Boron (total)	mg/L	0.176	0.169	0.166	3.0%
Cadmium (total)	mg/L	<0.000010	<0.000010	<0.000010	
Calcium (total)	mg/L	74.4	78.8	77.4	2.9%
Chromium (total)	mg/L	<0.00050	<0.00050	<0.00050	
Cobalt (total)	mg/L	0.0002	0.00017	0.00018	8.3%
Copper (total)	mg/L	0.00133	0.00113	0.00127	8.3%
Iron (total)	mg/L	0.034	0.033	0.032	3.0%
Lead (total)	mg/L	<0.00020	<0.00020	<0.00020	
Lithium (total)	mg/L	0.00769	0.00714	0.00673	6.7%
Magnesium (total)	mg/L	14.3	14.6	14.4	1.1%
Manganese (total)	mg/L	0.0389	0.0401	0.0375	3.4%
Mercury (total)	mg/L	<0.000010	<0.000010	<0.000010	
Molybdenum (total)	mg/L	0.00097	0.00113	0.00104	7.7%
Nickel (total)	mg/L	0.00202	0.00146	0.00168	16.4%
Selenium (total)	mg/L	<0.00050	<0.00050	<0.00050	
Silicon (total, as Si)	mg/L	10.8	10.4	10.3	2.5%
Silver (total)	mg/L	<0.000050	<0.000050	<0.000050	
Sodium (total)	mg/L	93.5	88.4	87.2	3.7%
Strontium (total)	mg/L	0.613	0.605	0.589	2.0%
Sulphur (total)	mg/L	17.7	17.4	17.6	0.9%
Tellurium (total)	mg/L	<0.00050	<0.00050	<0.00050	
Thallium (total)	mg/L	<0.000020	<0.000020	<0.000020	
Thorium (total)	mg/L	<0.00010	<0.00010	<0.00010	
Tin (total)	mg/L	<0.00020	<0.00020	<0.00020	
Titanium (total)	mg/L	<0.0050	<0.0050	<0.0050	
Tungsten (total)	mg/L	<0.0010	<0.0010	<0.0010	
Uranium (total)	mg/L	0.00301	0.0029	0.00277	4.2%
Vanadium (total)	mg/L	<0.0010	<0.0010	<0.0010	
Zinc (total)	mg/L	0.0299	0.0324	0.0322	4.4%
Zirconium (total)	mg/L	<0.00010	<0.00010	<0.00010	



Okanagan Falls Advanced Wastewater Treatment Facility

Duplicate Water Samples Report

		Sampling Location	Wetland Outlet	Wetland Outlet	Wetland Outlet	
		Date Sampled	21-Jul-21	21-Jul-21	21-Jul-21	
		Lab Sample ID for analyses except bacteriological	21G2729-01	21G2729-02	21G2729-03	
		Lab Sample ID for Bacteriological samples	21G2727-01	21G2727-02	21G2727-03	
		Sample Type	Normal	Duplicate	Duplicate	
Analyte	Unit					Relative Standard Deviation
Lab Results						
General						
5-d Carbonaceous BOD	mg/L		<5.3	<5.3	<5.3	
pH			7.93	7.93	7.99	0.4%
Total suspended solids	mg/L		<2.0	<2.0	<2.0	
Microbiological						
E. coli (MPN)	MPN/100 mL		20	13	12	29.1%
Nutrients						
Ammonia (total, as N)	mg/L		0.075	0.082	0.084	5.9%
Nitrate (as N)	mg/L		<0.010	<0.010	<0.010	
Nitrite (as N)	mg/L		<0.010	<0.010	<0.010	
Total nitrogen	mg/L		0.776	0.855	0.739	7.5%
Total kjeldahl nitrogen	mg/L		0.776	0.855	0.739	7.5%
Total organic nitrogen	mg/L		0.701	0.773	0.655	8.4%
Phosphorus (total, APHA 4500-P)	mg/L		0.045	0.0597	0.0465	16.0%



Duplicate Water Samples Report

		Okaganagan River Channel 100m Downstream	Okaganagan River Channel 100m Downstream	Okaganagan River Channel 100m Downstream	
Sampling Location					
Date Sampled		21-Jul-21	21-Jul-21	21-Jul-21	
Lab Sample ID for analyses except bacteriological		21G2737-02	21G2737-03	21G2737-04	
Lab Sample ID for Bacteriological samples		21G2736-02	21G2736-03	21G2736-04	
Sample Type		Normal	Duplicate	Duplicate	Relative Standard Deviation
Analyte	Unit				
Lab Results					
General					
Alkalinity (bicarbonate, as CaCO ₃)	mg/L	114	113	116	1.3%
Alkalinity (carbonate, as CaCO ₃)	mg/L	5.3	6.8	1.9	53.8%
Alkalinity (hydroxide, as CaCO ₃)	mg/L	<1.0	<1.0	<1.0	
Alkalinity (phenolphthalein, as CaCO ₃)	mg/L	2.7	3.4	<1.0	23.0%
Alkalinity (total, as CaCO ₃)	mg/L	119	120	118	0.8%
Biochemical oxygen demand	mg/L	1	<1.0	1.1	9.5%
Chemical Oxygen Demand	mg/L	18	26	22	18.2%
Chloride	mg/L	6.05	6.19	6.31	2.1%
Conductivity	µS/cm	266	271	267	1.0%
Fluoride	mg/L	0.14	0.14	0.14	0.0%
Hardness, Total (total as CaCO ₃)	mg/L	117	116	116	0.5%
pH		8.44	8.46	8.36	0.6%
Sulphate	mg/L	28.4	28.4	28.5	0.2%
Total suspended solids	mg/L	<4.0	<4.0	<4.0	
Microbiological					
E. coli (MPN)	MPN/100 mL	18	10	15	28.2%
Fecal coliforms (MPN)	MPN/100 mL	19	11	15	26.7%
Nutrients					
Ammonia (total, as N)	mg/L	<0.050	<0.050	<0.050	
Nitrate (as N)	mg/L	<0.010	<0.010	<0.010	
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	
Total nitrogen	mg/L	0.193	0.219	0.221	7.4%
Total kjeldahl nitrogen	mg/L	0.193	0.219	0.221	7.4%
Orthophosphate (dissolved, as P)	mg/L	<0.0050	<0.0050	<0.0050	
Phosphorus (total, by ICPMS/ICPOES)	mg/L	<0.050	<0.050	<0.050	
Phosphorus (total, APHA 4500-P)	mg/L	0.0101	0.0112	0.0107	5.2%
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.0087	0.0086	0.01	8.6%
Potassium (total)	mg/L	2.52	2.45	2.47	1.5%

Duplicate Water Samples Report

		Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	
Sampling Location					
Date Sampled		21-Jul-21	21-Jul-21	21-Jul-21	
Lab Sample ID for analyses except bacteriological		21G2737-02	21G2737-03	21G2737-04	
Lab Sample ID for Bacteriological samples		21G2736-02	21G2736-03	21G2736-04	
Sample Type		Normal	Duplicate	Duplicate	
Analyte	Unit				Relative Standard Deviation
Total Metals					
Aluminum (total)	mg/L	0.0171	0.0089	0.0069	49.3%
Antimony (total)	mg/L	<0.00020	<0.00020	<0.00020	
Arsenic (total)	mg/L	<0.00050	<0.00050	<0.00050	
Barium (total)	mg/L	0.0235	0.0245	0.0235	2.4%
Beryllium (total)	mg/L	<0.00010	<0.00010	<0.00010	
Bismuth (total)	mg/L	<0.00010	<0.00010	<0.00010	
Boron (total)	mg/L	<0.0500	<0.0500	<0.0500	
Cadmium (total)	mg/L	<0.000010	<0.000010	<0.000010	
Calcium (total)	mg/L	31.1	30.5	30.3	1.4%
Chromium (total)	mg/L	<0.00050	<0.00050	<0.00050	
Cobalt (total)	mg/L	<0.00010	<0.00010	<0.00010	
Copper (total)	mg/L	0.00098	0.00103	0.00072	18.3%
Iron (total)	mg/L	0.013	0.013	0.013	0.0%
Lead (total)	mg/L	<0.00020	<0.00020	<0.00020	
Lithium (total)	mg/L	0.00367	0.00357	0.00355	1.8%
Magnesium (total)	mg/L	9.66	9.53	9.67	0.8%
Manganese (total)	mg/L	0.00544	0.00514	0.00533	2.9%
Mercury (total)	mg/L	<0.000010	<0.000010	<0.000010	
Molybdenum (total)	mg/L	0.00317	0.00323	0.00333	2.5%
Nickel (total)	mg/L	0.00045	0.00086	0.00062	32.0%
Selenium (total)	mg/L	<0.00050	<0.00050	<0.00050	
Silicon (total, as Si)	mg/L	3.1	3.1	3	1.9%
Silver (total)	mg/L	<0.000050	<0.000050	<0.000050	
Sodium (total)	mg/L	12.4	12.1	12.4	1.4%
Strontium (total)	mg/L	0.285	0.281	0.282	0.7%
Sulphur (total)	mg/L	9.5	9.5	9.9	2.4%
Tellurium (total)	mg/L	<0.00050	<0.00050	<0.00050	
Thallium (total)	mg/L	<0.000020	<0.000020	<0.000020	
Thorium (total)	mg/L	<0.00010	<0.00010	<0.00010	
Tin (total)	mg/L	<0.00020	<0.00020	<0.00020	
Titanium (total)	mg/L	<0.0050	<0.0050	<0.0050	
Tungsten (total)	mg/L	<0.0010	<0.0010	<0.0010	
Uranium (total)	mg/L	0.00248	0.00242	0.00243	1.3%
Vanadium (total)	mg/L	<0.0010	<0.0010	<0.0010	
Zinc (total)	mg/L	0.018	<0.0040	<0.0040	
Zirconium (total)	mg/L	<0.00010	<0.00010	<0.00010	



Okanagan Falls Advanced Wastewater Treatment Facility

Duplicate Water Samples Report

Analyte	Unit	Vaseux Lake 1, 5, 10 m composite 06-Jul-21 21G0445-01 Normal	Vaseux Lake 1, 5, 10 m composite 06-Jul-21 21G0445-03 Duplicate	Vaseux Lake 1, 5, 10 m composite 06-Jul-21 21G0445-04 Duplicate	Relative Standard Deviation	Vaseux Lake 20, 22, 24 m composite 06-Jul-21 21G0445-02 Normal	Vaseux Lake 20, 22, 24 m composite 06-Jul-21 21G0445-05 Duplicate	Vaseux Lake 20, 22, 24 m composite 06-Jul-21 21G0445-06 Duplicate	Relative Standard Deviation
Lab Results									
General									
Chloride	mg/L	5.43	5.42	5.43	0.1%	5.67	5.65	5.66	0.2%
Chlorophyll a	mg/L	0.00154				0.00064			
Hardness, Total (total as CaCO ₃)	mg/L	120	116	122	2.6%	128	133	124	3.5%
Sulphate	mg/L	28.8	28.2	28.2	1.2%	27	27.1	27.1	0.2%
Nutrients									
Ammonia (total, as N)	mg/L	0.024	0.029	0.028	9.8%	0.073	0.073	0.078	3.9%
Nitrate (as N)	mg/L	<0.010	<0.010	<0.010		0.055	0.056	0.056	1.0%
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010		<0.010	<0.010	<0.010	
Total nitrogen	mg/L	0.356	0.974	0.273	71.7%	1.03	0.488	0.36	56.8%
Total kjeldahl nitrogen	mg/L	0.356	0.974	0.273	71.7%	0.975	0.432	0.304	62.5%
Total organic nitrogen	mg/L	0.332	0.945	0.245	75.2%	0.902	0.359	0.226	72.3%
Orthophosphate (dissolved, as P)	mg/L	<0.0050	<0.0050	<0.0050		<0.0050	<0.0050	<0.0050	
Phosphorus (total, by ICPMS/ICPOES)	mg/L	<0.050	<0.050	0.061		0.097	0.06	0.062	28.5%
Phosphorus (total, APHA 4500-P)	mg/L	0.0147	0.0127	0.0123	9.7%	0.0495	0.0417	0.0432	9.2%
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.0147	0.0127	0.0123	9.7%	0.0246	0.0243	0.0251	1.6%
Potassium (total)	mg/L	2.39	2.28	2.41	3.0%	2.54	2.65	2.52	2.7%

Okanagan Falls Advanced Wastewater Treatment Facility

Duplicate Water Samples Report

Analyte	Unit	Vaseux Lake 1, 5, 10 m composite			Relative Standard Deviation	Vaseux Lake 20, 22, 24 m composite			Relative Standard Deviation
		Date Sampled	Lab Sample ID	Sample Type		Date Sampled	Lab Sample ID	Sample Type	
Total Metals									
Aluminum (total)	mg/L	06-Jul-21	21G0445-01	Normal	9.1%	06-Jul-21	21G0445-02	Normal	5.8%
Antimony (total)	mg/L	06-Jul-21	21G0445-03	Duplicate		06-Jul-21	21G0445-05	Duplicate	
Arsenic (total)	mg/L	06-Jul-21	21G0445-04	Duplicate		06-Jul-21	21G0445-06	Duplicate	
Barium (total)	mg/L	0.0159	0.0148	0.0177	2.6%	0.0172	0.0154	0.0169	2.8%
Beryllium (total)	mg/L	<0.00020	<0.00020	<0.00020		<0.00020	<0.00020	<0.00020	
Bismuth (total)	mg/L	<0.00050	0.00052	<0.00050		0.0006	0.00066	0.00063	4.8%
Boron (total)	mg/L	0.0238	0.0229	0.0241		0.0263	0.0278	0.0273	
Cadmium (total)	mg/L	<0.00010	<0.00010	<0.00010		<0.00010	<0.00010	<0.00010	
Calcium (total)	mg/L	<0.00010	<0.00010	<0.00010		<0.00010	<0.00010	<0.00010	
Chromium (total)	mg/L	<0.0500	<0.0500	<0.0500		<0.0500	<0.0500	<0.0500	
Cobalt (total)	mg/L	<0.000010	<0.000010	<0.000010		<0.000010	<0.000010	<0.000010	
Copper (total)	mg/L	32.3	31.4	33.2	68.3%	35	36.6	34.1	17.1%
Iron (total)	mg/L	<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	
Lead (total)	mg/L	<0.00010	<0.00010	<0.00010		<0.00010	<0.00010	<0.00010	
Lithium (total)	mg/L	0.00253	0.00078	0.00094	28.5%	0.00063	0.00079	0.00057	2.8%
Magnesium (total)	mg/L	0.038	0.021	0.031		0.261	0.272	0.258	
Manganese (total)	mg/L	<0.00020	<0.00020	<0.00020		<0.00020	<0.00020	<0.00020	
Molybdenum (total)	mg/L	0.00327	0.00317	0.00331		0.00327	0.00351	0.00328	
Nickel (total)	mg/L	9.46	9.14	9.51	2.2%	9.75	10	9.54	4.0%
Selenium (total)	mg/L	0.0058	0.00559	0.00613		0.248	0.257	0.246	
Silicon (total, as Si)	mg/L	0.00389	0.00354	0.00387	4.7%	0.00341	0.00377	0.00334	6.6%
Silver (total)	mg/L	0.00062	0.00047	0.00059	14.2%	0.00052	0.00059	0.00052	7.4%
Sodium (total)	mg/L	<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	
Strontium (total)	mg/L	2.9	2.7	2.9	4.1%	4.3	4.6	4.4	3.4%
Sulphur (total)	mg/L	<0.000050	<0.000050	<0.000050		<0.000050	<0.000050	<0.000050	
Tellurium (total)	mg/L	12.3	11.8	12.3	2.4%	12.5	12.9	12.3	2.4%
Thallium (total)	mg/L	0.28	0.266	0.28	2.9%	0.295	0.307	0.295	2.3%
Thorium (total)	mg/L	10.6	9.1	6.8	21.7%	6.6	7.9	7.1	9.1%
Tin (total)	mg/L	<0.00050	<0.00050	0.00052		<0.00050	<0.00050	<0.00050	
Titanium (total)	mg/L	<0.000020	<0.000020	<0.000020		<0.000020	<0.000020	<0.000020	
Tungsten (total)	mg/L	<0.00010	<0.00010	<0.00010		<0.00010	<0.00010	<0.00010	
Uranium (total)	mg/L	0.0002	<0.00020	<0.00020		<0.00020	<0.00020	<0.00020	
Vanadium (total)	mg/L	<0.0050	<0.0050	<0.0050		<0.0050	<0.0050	<0.0050	
Zinc (total)	mg/L	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	
Zirconium (total)	mg/L	0.00234	0.00232	0.00235	0.7%	0.00216	0.00223	0.00204	4.5%
	mg/L	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	
	mg/L	0.0069	0.004	0.0045	30.2%	<0.0040	<0.0040	0.0041	
	mg/L	0.00011	<0.00010	<0.00010		<0.00010	<0.00010	<0.00010	



Legend for Reports for RDOS Wastewater Treatment Sites Water Quality Results

<	Less than reported detection limit
>	Greater than reported upper detection limit
>=	Greater than or equal to
A	Absent
m asl	metres above sea level
ND	Non-detect. Result is less than lower detection limit.
NR	No Result
NT	Not Tested
OG	Overgrown
P	Present
PR	Presumptive
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
TNTC	Too numerous to count

APPENDIX K

Effluent Annual Bioassay 2021



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F2998
ATTENTION	Rob Palmer	RECEIVED / TEMP REPORTED	2021-06-23 08:30 / 22.9°C
PO NUMBER	OK Falls WW	COC NUMBER	B099115
PROJECT	OK Falls WW		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

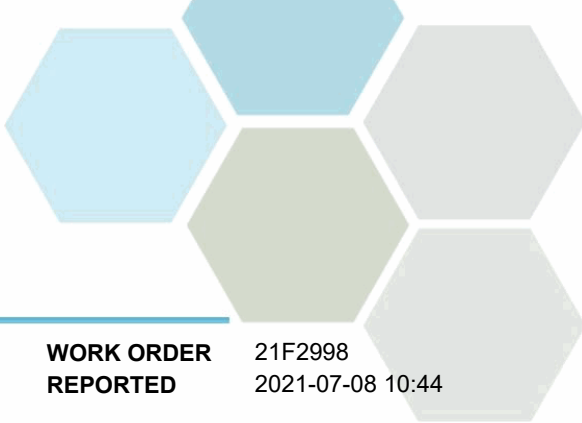
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

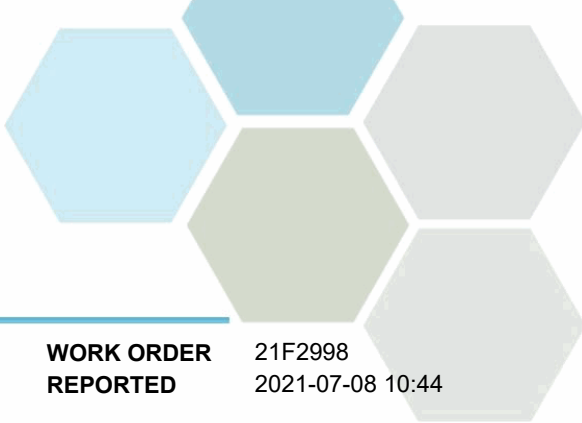
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WW

WORK ORDER REPORTED 21F2998
2021-07-08 10:44

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Effluent Grab (21F2998-01) Matrix: Water Sampled: 2021-06-21 09:55						
<i>Oncorhynchus mykiss Bioassay</i>						
Mortality, 96 h Trout	0	N/A		% Mortality	2021-06-28	TOX

Sample Qualifiers:

TOX Please refer to the Appendix for the full Toxicity Report



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WW

WORK ORDER REPORTED 21F2998
2021-07-08 10:44

Analysis Description	Method Ref.	Technique	Accredited	Location
Trout Mortality in Water	EPS 1/RM/13 A	Rainbow Trout Acute Lethality: Single-concentration	✓	Edmonton

Glossary of Terms:

RL	Reporting Limit (default)
% Mortality	Percent mortality
EPS	Environment Canada Biological Test Methods

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user

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. The quality control (QC) data is available upon request

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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.

Work Order: 21F2998

Client: Regional District of Okanagan Similkameen
 Project: OK Falls WW
 Attention: Rob Palmer

1. SAMPLE INFORMATION

Sample Origin: Regional District of Okanagan Similkameen
Penticton, BC
 Sample Type: Effluent
 Sample Description: Effluent Grab
 Sampling Date and Time: June 21, 2021 @ 9:55 hrs
 Sampling Method: Grab
 Sampled by: Karen Moore

2. TEST INFORMATION

Laboratory Name / Location: CARO Analytical Services (Edmonton)
 Laboratory Address: 17225 109 Avenue NW
Edmonton, AB T5S 1H7

Test Organism: *Oncorhynchus mykiss*
 Test Description: Acute, 96-hour, static, Single-concentration (Mortality)
 Lab Test Method ID: CE-TM-027
 Reference Method: Biological Test method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 2000. Environment Canada, EPS 1/RM/13, 2nd Ed. , (including May 2007 ammendments)

Analyst Name: Travis Briggeman
 Start of Test Date: June 24, 2021
 Holding/Dilution Water: Dechlorinated City of Edmonton tap water, acclimated to test conditions

Test Container Description: 25 L, Disposable polyethylene liner
 Test Solution Volume: 20 L
 Test Solution Depth: 33 cm
 Number of Test Organisms/Container: 10 (1 organism per 2 L)
 Aeration of test solutions: 6.5 ± 1 mL/min per L
 pH Adjustment: The sample was not pH adjusted
 Lighting: Full spectrum fluorescent lights; 100-500 lux at surface
 Photoperiod: 16 h light : 8 h dark
 Deviations from Reference Method: None

Work Order: 21F2998

3. RECEIPT CONDITION

Container Description: 20 L HDPE carboy Qty: 1 Volume (L): 20
 Receipt Date and Time: June 23, 2021 @ 8:30 hrs
 Transit Irregularities: None
 Observations: Colour: Yellow
 Odour: None
 Turbidity: None
 Settleable Solids: Low
 Measured Parameters: Temperature: 16.6 °C
 pH: 7.09
 Conductivity: 868 μmhos/cm
 Dissolved Oxygen: 6.11 mg/L

4. PRE-AERATION

Duration at 6.5 ± 1 mL/min per L: 90 min

Sample Test Concentration (V/V):		<u>100%</u>	<u>0%</u>	
Before Pre-Aeration	Dissolved Oxygen:	<u>5.95</u>	<u>9.03</u>	mg/L
	Air Saturation:	<u>65</u>	<u>97</u>	%
After Pre-Aeration	Dissolved Oxygen:	<u>7.50</u>	<u>9.26</u>	mg/L
	Air Saturation:	<u>81</u>	<u>100</u>	%

5. TEST ORGANISM DATA

Lot Number: 210505
 Weekly Mortality Preceding Test: 0 %
 Number of fish per test solution: 10
 Loading Density: 0.27 g/L

Fish #	Wet Weight (g)	Fork Length (cm)
1	<u>0.49</u>	<u>3.9</u>
2	<u>0.64</u>	<u>4.1</u>
3	<u>0.54</u>	<u>3.9</u>
4	<u>0.34</u>	<u>3.5</u>
5	<u>0.82</u>	<u>4.6</u>
6	<u>0.35</u>	<u>3.4</u>
7	<u>0.80</u>	<u>4.4</u>
8	<u>0.68</u>	<u>4.3</u>
9	<u>0.38</u>	<u>3.6</u>
10	<u>0.33</u>	<u>3.5</u>
Average	<u>0.54</u>	<u>3.9</u>
StDev	<u>0.19</u>	<u>0.4</u>

Work Order: 21F2998

6. TEST DATA

Sample Concentration (% V/V)

100	0
-----	---

0 hours Time: 12:58 PM

Temperature (°C)
pH
Conductivity @ 25°C (µmhos/cm):
Dissolved Oxygen (mg/L):

15.4	15.0
7.48	7.84
867	379
7.50	9.26

24 hours Time: 1:27 PM

Stressed (Qty)
Mortality (Qty)
Temperature (°C)
pH
Conductivity @ 25°C (µmhos/cm):
Dissolved Oxygen (mg/L):

0	0
0	0
15.3	15.2
8.22	8.03
859	378
9.01	9.09

48 hours Time: 1:58 PM

Stressed (Qty)
Mortality (Qty)
Temperature (°C)
pH
Conductivity @ 25°C (µmhos/cm):
Dissolved Oxygen (mg/L):

0	0
0	0
15.3	15.1
8.29	8.10
859	382
9.02	9.22

72 hours Time: 1:33 PM

Stressed (Qty)
Mortality (Qty)
Temperature (°C)
pH
Conductivity @ 25°C (µmhos/cm):
Dissolved Oxygen (mg/L):

0	0
0	0
15.3	15.1
8.31	8.08
866	388
9.07	9.21

96 hours Time: 1:25 PM

Stressed (Qty)
Mortality (Qty)
Temperature (°C)
pH
Conductivity @ 25°C (µmhos/cm):
Dissolved Oxygen (mg/L):

0	0
0	0
15.4	15.3
8.23	7.96
861	385
9.01	9.09

Work Order: 21F2998

7. SUBLETHAL BIOLOGICAL EFFECTS

Sample Conc (%)	Time(s) Observed (h)	Effect(s) Observed
		None

8. OBSERVATIONS / COMMENTS

None

9. RESULTS

Mortality (%) 0

10. REFERENCE TOXICANT DATA

Toxicant: Phenol
 Test Starting Date: May 27, 2021
 96-hour LC₅₀ (mg/L) 10.10
 95% Lower Confidence Interval v/v (%): 9.31
 95% Upper Confidence Interval v/v (%): 10.95
 Method of Calculation: Spearman-Kärber
 Confirmed by Graph: Yes
 Historic Geometric Mean LC₅₀ (mg/L) 10.22
 95% Lower Confidence Interval v/v (%): 8.36
 95% Upper Confidence Interval v/v (%): 12.50

Data reviewed by: Jesse Dang

Signature 

APPENDIX L

Effluent 2021 Lab and RDOS Process Monitoring Data

Okanagan Falls Advanced Wastewater Treatment Facility

DATE	TIME (24HR)	*DAILY/WEEKLY/ MONTHLY/QUARTERLY/RE-SAMPLE	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	BOD (CARO)	cBOD (CARO)	BOD or cBOD MAC (OC)	COD (CARO)	Transmittance @ 254 nm (WEDECO)	Transmittance @ 254 nm UVT (CARO)	Transmittance @ 440 nm (CHEMSCAN)	REACTIVE ORTHOPHOSPHATE as P (RDOS)	ORTHOPHOSPHATE as P (CARO)	ORTHOPHOSPHATE as P (CHEMSCAN)	TOTAL PHOSPHORUS (RDOS)	PHOSPHORUS TOTAL KJEDAHL (CARO)	PHOSPHORUS TOTAL KJEDAHL DISSOLVED (CARO)	TOTAL PHOSPHORUS (CARO) RUNNING ANNUAL AVERAGE	TOTAL PHOSPHORUS DAILY MAC (OC)	TOTAL PHOSPHORUS DAILY TARGET (OC)
dd/mm/yr	HR:MIN	D/W/M/Q			mg/L		mg/L	mg/L	% [1cm]	%UVT	% [1cm]	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
06-Jan-21	11:10	W	KM	KM			10	34	75.7	68.5	89.91	0.05	0.0088	<0.05	0.173	0.166		0.148	2.0	0.01
13-Jan-21	10:36	W	KM	KM			10	21	77.7	70.7	91.93	0.04	<0.0050	<0.05	0.115	0.131		0.148	2.0	0.01
20-Jan-21	11:20	Q	KM	KM	1.2	1.2	10	22	80.9	74.7	92.93	0.05	<0.0050	<0.05	0.100	0.104	0.0404	0.148	2.0	0.01
27-Jan-21	13:15	W	KM	KM			10	31	78.9	72.0	90.28	0.03	<0.0050	<0.05	0.133	0.152		0.148	2.0	0.01
03-Feb-21	10:53	W	KM	KM			10	34	77.7	67.1	89.55	0.06	0.0185	<0.05	0.248	0.157		0.148	2.0	0.01
09-Feb-21	10:40	W	KM	KM			10	31	77.9	70.1	91.41	0.03	0.0283	<0.05	0.114	0.117		0.149	2.0	0.01
17-Feb-21	10:30	M	KM	KM	6.1	6.3	10	35	76.2	67.4	91.22	0.07	0.0071	<0.05	0.144	0.148	0.0722	0.150	2.0	0.01
23-Feb-21	9:50	W	KM	KM			10	40	75.3	67.0	90.93	0.05	0.0191	<0.05	0.142	0.169		0.151	2.0	0.01
03-Mar-21	10:43	W	KM	KM			10	48	71.8	67.0	88.06	0.09	0.0399	<0.05	0.265	0.279		0.154	2.0	0.01
09-Mar-21	10:55	W	KM	KM			10	52	70.9	66.0	86.03	0.09	0.0111	<0.05	0.250	0.288		0.157	2.0	0.01
16-Mar-21	10:43	W	KM	KM			10	20	80.1	71.9	91.44	0.10	0.0541	<0.05	0.181	0.201		0.159	2.0	0.01
24-Mar-21	10:30	M	KM	KM	1.8	1.7	10	35	80.6	71.8	92.61	0.10	0.0107	<0.05	0.136	0.147	0.0729	0.160	2.0	0.01
30-Mar-21	11:33	W	RS	KM			10	31	80.6	61.1	92.51	0.09	0.0223	<0.05	0.137	0.157		0.160	2.0	0.01
06-Apr-21	11:25	W	KM	KM			10	48	79.6	71.0	92.66	0.05	<0.0050	<0.05	0.133	0.160		0.161	2.0	0.01
14-Apr-21	10:37	W	KM	KM			10	28	80.6	71.5	94.16	0.08	0.0054	<0.05	0.179	0.137		0.160	2.0	0.01
20-Apr-21	11:30	Q	KM	KM	2.0	1.5	10	27	77.7	68.5	93.19	0.06	0.0068	<0.05	0.104	0.120	0.0659	0.159	2.0	0.01
28-Apr-21	12:35	W	KM	KM			10	35	77.3	69.1	92.99	0.07	0.005	<0.05	0.094	0.121		0.159	2.0	0.01
05-May-21	13:03	W	KM	KM			10	43	77.3	67.9	94.40	0.07	0.0144	<0.05	0.115	0.145		0.159	2.0	0.01
11-May-21	11:52	W	KM	KM			10	34	76.7	66.2	93.03	0.10	0.0252	<0.05	0.121	0.167		0.159	2.0	0.01
18-May-21	11:20	M	KM	KM	2.5	2.0	10	33	76.7	66.7	92.35	0.07	0.0135	<0.05	0.127	0.134	0.0886	0.159	2.0	0.01
26-May-21	10:22	W	KM	KM			10	29	76.1	64.7	93.06	0.08	0.0166	<0.05	0.100	0.119		0.158	2.0	0.01
02-Jun-21	10:23	W	KM	KM			10	35	78.5	67.2	93.42	0.05	<0.005	<0.05	0.089	0.117		0.158	2.0	0.01
09-Jun-21	10:20	W	KM	KM			10	33	79.3	69.7	94.51	0.06	0.005	<0.05	0.078	0.111		0.158	2.0	0.01
16-Jun-21	10:18	M	KM	KM	2.4		10	20	80.1	67.8	93.67	0.08	0.0585	<0.05	0.116	0.124	0.0940	0.158	2.0	0.01
21-Jun-21	9:55	Bioassay	KM				10		80.9		94.68			0.13				0.159	2.0	0.01
22-Jun-21	10:10	W	KM	KM			10	30	80.9	72.6	96.00	0.10	0.0200	0.07	0.138	0.151		0.160	2.0	0.01
28-Jun-21	12:53	W	KM	KM			10	29	80.9	73.4	96.00	0.13	0.124	0.20	0.173	0.156		0.159	2.0	0.01
06-Jul-21	11:43	W	SC	SC			10	42	80.9	70.2	95.00	0.05	<0.0050	0.12	0.096	0.087		0.155	2.0	0.01
12-Jul-21	10:38	W	KM	KM			10	15	80.9	68.8	94.14	0.09	0.0323	0.13	0.114	0.106		0.154	2.0	0.01
21-Jul-21	10:10	Q	KM	KM	<1	<2.4	10	21	80.9	71.0	95.14	0.12	0.0447	0.15	0.172	0.151	0.1377	0.155	2.0	0.01
27-Jul-21	11:10	W	CH	CH			10	13	80.9	73.4	95.44	0.06	0.0416	0.11	0.094	0.105		0.154	2.0	0.01
04-Aug-21	10:30	W	KM	KM			10	24	80.9	72.8	94.77	0.11	0.0729	0.16	0.148	0.160		0.155	2.0	0.01
10-Aug-21	11:58	M	KM	KM	1.3		10	28	80.9	63.0	94.93	0.05	0.0111	0.09	0.076	0.089	0.0648	0.154	2.0	0.01

Okanagan Falls Advanced Wastewater Treatment Facility

DATE	TIME (24HR)	*DAILY/WEEKLY/ MONTHLY/QUARTERLY/RE-SAMPLE	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	BOD (CARO)	cBOD (CARO)	BOD or cBOD MAC (OC)	COD (CARO)	Transmittance @ 254 nm (WEDECO)	Transmittance @ 254 nm UVT (CARO)	Transmittance @ 440 nm (CHEMSCAN)	REACTIVE ORTHOPHOSPHATE as P (RDOS)	ORTHOPHOSPHATE as P (CARO)	ORTHOPHOSPHATE as P (CHEMSCAN)	TOTAL PHOSPHORUS (RDOS)	PHOSPHORUS TOTAL KJEDAHL (CARO)	PHOSPHORUS TOTAL KJEDAHL DISSOLVED (CARO)	TOTAL PHOSPHORUS (CARO) RUNNING ANNUAL AVERAGE	TOTAL PHOSPHORUS DAILY MAC (OC)	TOTAL PHOSPHORUS DAILY TARGET (OC)
dd/mm/yr	HR:MIN	D/W/M/Q			mg/L		mg/L	mg/L	% [1cm]	%UVT	% [1cm]	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
18-Aug-21	12:02	W	KM	KM			10	15	80.9	72.9	94.88	0.08	0.0442	0.08	0.084	0.101		0.153	2.0	0.01
25-Aug-21	11:25	W	KM	KM			10	22	80.9	71.4	94.63	0.08	0.0254	0.07	0.115	0.130		0.153	2.0	0.01
27-Aug-21	13:40	Coliform only	RS				10		80.9		93.93			0.05				0.153	2.0	0.01
31-Aug-21	11:50	W	KM	KM			10	20	80.9	73.3	95.60	0.14	0.0747	0.12	0.162	0.174		0.153	2.0	0.01
07-Sep-21	13:25	W	KM	KM			10	24	80.9	71.9	95.00	0.13	0.0766	0.15	0.185	0.175		0.153	2.0	0.01
13-Sep-21	12:05	W	KM	KM			10	24	80.9	71.6	95.08	0.10	0.0253	0.11	0.144	0.124		0.154	2.0	0.01
21-Sep-21	11:55	M	KM	KM		<7.4	10	38	80.9	68.7	93.07	0.09	0.0136	0.06	0.134	0.124	0.0882	0.153	2.0	0.01
28-Sep-21	11:10	W	KM	KM			10	20	80.9	68.0	94.00	0.12	0.0339	0.05	0.146	0.148		0.154	2.0	0.01
04-Oct-21	10:40	W	KM	KM			10	51	80.9	66.3	94.00	0.09	<0.005	<0.05	0.116	0.110		0.152	2.0	0.01
13-Oct-21	11:45	W	RS	RS/KM			10	29	80.9	68.1	93.00	0.13	0.0148	<0.05		0.0921		0.151	2.0	0.01
19-Oct-21	10:30	Q	KM	KM	1.5	2.2	10	20	80.9	66.8	93.26	0.08	0.0263	<0.05	0.117	0.123	0.0912	0.147	2.0	0.01
25-Oct-21	10:28	W	KM/CH	KM			10	26	80.9	66.0	93.00	0.06	0.0458	<0.05	0.108	0.083		0.146	2.0	0.01
01-Nov-21	11:00	W	KM	KM			10	31	80.9	66.1	93.14	0.07	<0.005	<0.05	0.112	0.136		0.143	2.0	0.01
08-Nov-21	10:45	W	KM	KM			10	31	80.9	67.4	93.27	0.05	0.0325	<0.05	0.094	0.124		0.142	2.0	0.01
15-Nov-21	13:33	W	RS	RS/KM			10	30	80.9	66.1	92.00	0.08	<0.005	<0.05	0.130	0.144		0.138	2.0	0.01
22-Nov-21	11:12	M	KM	KM		5.6	10	28	80.9	66.1	92.00	0.09	0.0056	<0.05	0.140	0.145	0.108	0.138	2.0	0.01
29-Nov-21	13:10	W	KM	KM			10	29	80.9	67.7	91.98	0.10	0.0130	<0.05	0.147	0.152		0.138	2.0	0.01
07-Dec-21	11:33	M	KM	KM		4.6	10	50	80.9	65.3	90.92	0.13	0.0288	<0.05	0.189	0.209	0.154	0.140	2.0	0.01
13-Dec-21	10:25	W	KM	KM			10	30	80.9	64.2	90.00	0.09	0.0183	<0.05	0.179	0.192		0.142	2.0	0.01
20-Dec-21	10:25	W	KM	KM			10	32	80.9	66.8	90.71	0.07	0.0456	<0.05	0.145	0.147		0.142	2.0	0.01
28-Dec-21	10:15	W	KM	KM			10	30	80.9	66.0	91.00	0.06	<0.005	<0.05	0.144	0.143		0.143	2.0	0.01
	Average				1.8	2.7		30	79.5	68.7	92.9	0.080	0.0251	0.07	0.137	0.143	0.0967			
	n				9	10		52	54	52	54	52	54	54	51	52	12			
	Std. Dev.				1.6	1.9		9	2.3	3.0	2.0	0.027	0.0243	0.04	0.041	0.040	0.034			
	Min				<1	<2.4		13	70.9	61.1	86.0	0.030	<0.005	<0.05	0.076	0.0833	0.0404			
	Max				6.1	6.3		52	80.9	74.7	96.0	0.140	0.124	0.20	0.265	0.288	0.154			
Total Loadings From WWTP, kg/yr					385.9	578.9		6520				17	5	15	29.4	30.7	21			
Loadings From WWTP To River, kg/yr					240.8	361.2		4068				11	3	9	18.3	19.2	13			

Okanagan Falls Advanced Wastewater Treatment Facility

DATE	TIME (24HR)	*DAILY/WEEKLY/ MONTHLY/QUARTERLY/RE-SAMPLE	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	NITRATE as N (RDOS)	NITRATE as N (CARO)	NITRATE + NITRITE as N (CHEMSCAN)	NITRITE as N (RDOS)	NITRITE as N (CARO)	AMMONIA as N (RDOS)	AMMONIA as N (CARO)	AMMONIUM as N (CHEMSCAN)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL KJELDAHL NITROGEN (CARO)	ORGANIC NITROGEN, CALCULATED (CARO)	TOTAL NITROGEN (CARO)	TOTAL NITROGEN (CARO) RUNNING ANNUAL AVERAGE	TOTAL NITROGEN DAILY MAC (OC)	TOTAL NITROGEN ANNUAL AVERAGE (OC)
dd/mm/yr	HR:MIN	D/W/M/Q			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
06-Jan-21	11:10	W	KM	KM	2.70	2.20	2.93	0.070	0.064	0.096	0.149	0.30	1.26	4.13				3.83	10.0	6.0
13-Jan-21	10:36	W	KM	KM	2.27	1.95	2.67	0.043	0.035	0.082	0.103	0.36	1.46	3.85				3.82	10.0	6.0
20-Jan-21	11:20	Q	KM	KM	3.15	2.93	2.61	0.032	0.022	0.084	0.096	0.42	1.60	4.87	1.44	1.34	4.39	3.60	10.0	6.0
27-Jan-21	13:15	W	KM	KM	2.63	2.36	2.28	<0.015	0.010	0.051	0.080	0.28	1.32	4.00				3.42	10.0	6.0
03-Feb-21	10:53	W	KM	KM	3.32	3.14	2.98	0.024	0.016	0.094	0.125	0.28	1.97	5.41				3.42	10.0	6.0
09-Feb-21	10:40	W	KM	KM	4.49	4.11	4.61	0.062	0.045	0.161	0.179	0.41	1.24	5.95				3.42	10.0	6.0
17-Feb-21	10:30	M	KM	KM	3.96	3.35	4.36	0.079	0.062	0.580	0.578	0.75	2.29	6.91	2.26	1.68	5.67	3.59	10.0	6.0
23-Feb-21	9:50	W	KM	KM	3.43	3.22	3.51	0.098	0.070	0.377	0.360	0.46	2.52	6.42				3.49	10.0	6.0
03-Mar-21	10:43	W	KM	KM	3.17	2.88	3.27	0.163	0.132	1.62	1.41	1.54	1.71	6.66				3.49	10.0	6.0
09-Mar-21	10:55	W	KM	KM	1.63	1.33	1.66	0.060	0.043	0.327	0.338	0.43	1.97	3.99				3.49	10.0	6.0
16-Mar-21	10:43	W	KM	KM	1.28	1.05	0.64	0.037	0.039	0.199	0.219	0.43	1.50	3.02				3.49	10.0	6.0
24-Mar-21	10:30	M	KM	KM	1.04	0.721	0.70	0.025	0.018	0.083	0.109	0.27	2.04	3.19	1.53	1.42	2.27	3.37	10.0	6.0
30-Mar-21	11:33	W	RS	KM	0.745	0.384	0.47	0.019	0.014	0.110	0.109	0.30	1.28	2.15				3.37	10.0	6.0
06-Apr-21	11:25	W	KM	KM	0.337	0.058	<0.09	0.014	<0.010	0.097	0.098	0.31	1.63	2.08				3.37	10.0	6.0
14-Apr-21	10:37	W	KM	KM	0.441	0.18	0.16	0.030	0.019	0.068	0.212	0.29	1.41	1.95				3.37	10.0	6.0
20-Apr-21	11:30	Q	KM	KM	0.223	<0.010	0.39	0.007	<0.010	0.075	0.100	0.19	1.48	1.78	1.47	1.37	1.57	3.20	10.0	6.0
28-Apr-21	12:35	W	KM	KM	0.355	0.113	0.52	0.016	<0.010	0.101	0.122	0.19						3.20	10.0	6.0
05-May-21	13:03	W	KM	KM	0.224	0.020	1.08	0.005	<0.010	0.135	0.166	0.26	1.44	1.80				3.20	10.0	6.0
11-May-21	11:52	W	KM	KM	0.256	0.021	0.47	0.008	<0.010	0.204	0.216	0.32	1.07	1.54				3.20	10.0	6.0
18-May-21	11:20	M	KM	KM	0.287	0.031	0.25	0.018	<0.010	0.241	0.255	0.39	1.04	1.59	1.61	1.36	1.64	3.11	10.0	6.0
26-May-21	10:22	W	KM	KM	0.420	0.132	0.73	0.161	<0.010	0.233	0.265	0.15	1.23	2.04				3.11	10.0	6.0
02-Jun-21	10:23	W	KM	KM	0.536	0.278	0.89	0.104	0.071	0.266	0.301	0.27	0.90	1.81				3.11	10.0	6.0
09-Jun-21	10:20	W	KM	KM	1.23	0.982	2.30	0.185	0.133	0.211	0.185	0.20	1.22	2.85				3.11	10.0	6.0
16-Jun-21	10:18	M	KM	KM	2.02	1.78	2.32	0.181	0.130	0.151	0.156	0.12	0.83	3.18	1.38	1.23	3.30	3.05	10.0	6.0
21-Jun-21	9:55	Bioassay	KM				2.00					0.88						3.05	10.0	6.0
22-Jun-21	10:10	W	KM	KM	0.700	0.388	1.00	0.162	0.111	0.222	0.373	0.27	0.59	1.67				3.05	10.0	6.0
28-Jun-21	12:53	W	KM	KM	3.75	3.36	3.00	0.062	0.040	0.121	0.147	0.16	0.91	4.84				3.05	10.0	6.0
06-Jul-21	11:43	W	SC	SC	3.18	2.88	5.00	0.093	0.062	0.137	0.278	0.15	0.21	3.62				3.05	10.0	6.0
12-Jul-21	10:38	W	KM	KM	3.86	3.51	2.91	0.101	0.052	0.174	0.232	<0.09	0.99	5.12				3.05	10.0	6.0
21-Jul-21	10:10	Q	KM	KM	2.73	2.28	3.67	0.053	0.0253	0.147	0.161	0.25	0.57	3.50	1.09	0.93	3.39	3.08	10.0	6.0
27-Jul-21	11:10	W	CH	CH	1.93	1.53	1.07	0.054	0.033	0.143	0.15	0.24	0.18	2.31				3.08	10.0	6.0
04-Aug-21	10:30	W	KM	KM	2.97	2.53	2.36	0.039	0.021	0.179	0.156	0.15	0.29	3.48				3.08	10.0	6.0
10-Aug-21	11:58	M	KM	KM	1.94	1.52	1.35	0.086	0.052	0.143	0.141	0.31	0.95	3.12	1.16	1.01	2.73	3.05	10.0	6.0

Okanagan Falls Advanced Wastewater Treatment Facility

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dd/mm/yr	HR:MIN	D/W/M/Q			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
18-Aug-21	12:02	W	KM	KM	3.35	3.07	3.82	0.058	0.039	0.123	0.217	0.33	0.92	4.45				3.05	10.0	6.0
25-Aug-21	11:25	W	KM	KM	2.79	2.37	3.53	0.053	0.033	0.113	0.25	0.35	1.08	4.04				3.05	10.0	6.0
27-Aug-21	13:40	Coliform only	RS				2.00					0.25						3.05	10.0	6.0
31-Aug-21	11:50	W	KM	KM	2.06	1.77	1.78	0.044	0.027	0.170	0.197	0.33	1.09	3.36				3.16	10.0	6.0
07-Sep-21	13:25	W	KM	KM	2.37	2.02	2.00	0.077	0.050	0.173	0.163	0.37	1.07	3.69				3.16	10.0	6.0
13-Sep-21	12:05	W	KM	KM	2.53	2.26	2.16	0.090	0.062	0.162	0.209	0.34	1.27	4.05				3.16	10.0	6.0
21-Sep-21	11:55	M	KM	KM	1.85	1.76	2.38	0.208	0.162	0.160	0.329	0.40	1.33	3.55	1.46	1.13	3.38	3.18	10.0	6.0
28-Sep-21	11:10	W	KM	KM	2.09	1.85	2.00	0.295	0.246	0.405	0.461	0.57	1.06	3.85				3.18	10.0	6.0
04-Oct-21	10:40	W	KM	KM	2.70	2.38	3.00	0.321	0.257	0.268	0.309	0.40	0.94	4.23				3.22	10.0	6.0
13-Oct-21	11:45	W	RS	RS/KM	2.12	1.79	2.00	0.320	0.261	0.966	0.286	0.38	0.30	3.71				3.22	10.0	6.0
19-Oct-21	10:30	Q	KM	KM	1.77	1.55	2.39	0.290	0.222	0.460	0.498	0.61	1.21	3.73	1.97	1.13	3.74	3.26	10.0	6.0
25-Oct-21	10:28	W	KM/CH	KM	1.56	1.25	1.00	0.254	0.202	1.26	1.28	1.36	1.29	4.36				3.31	10.0	6.0
01-Nov-21	11:00	W	KM	KM	2.11	1.67	2.50	0.134	0.092	0.975	0.983	1.13	1.29	4.51				3.31	10.0	6.0
08-Nov-21	10:45	W	KM	KM	1.68	1.25	1.44	0.124	0.084	0.971	0.980	1.21	1.11	3.88				3.31	10.0	6.0
15-Nov-21	13:33	W	RS	RS/KM	1.96	1.59	3.20	0.137	0.100	0.820	0.934	0.91	1.28	4.20				3.31	10.0	6.0
22-Nov-21	11:12	M	KM	KM	2.19	1.75	2.20	0.146	0.106	1.02	1.00	1.15	1.31	4.67	2.45	1.44	4.30	3.38	10.0	6.0
29-Nov-21	13:10	W	KM	KM	2.09	1.70	2.10	0.139	0.093	1.60	1.92	1.61	1.46	5.29				3.30	10.0	6.0
07-Dec-21	11:33	M	KM	KM	1.89	1.44	2.12	0.091	0.059	1.20	1.21	1.28	1.30	4.48	2.68	1.47	4.18	3.37	10.0	6.0
13-Dec-21	10:25	W	KM	KM	1.93	1.46	1.80	0.107	0.074	1.49	1.35	1.49	1.31	4.84				3.37	10.0	6.0
20-Dec-21	10:25	W	KM	KM	1.64	1.17	1.00	0.064	0.044	1.68	1.56	1.62	1.21	4.59				3.38	10.0	6.0
28-Dec-21	10:15	W	KM	KM	0.640	1.25	1.00	0.084	0.057	4.49	3.88	3.94	0.42	5.63				3.38	10.0	6.0
Average					1.97	1.70	2.07	0.101	0.080	0.489	0.492	0.59	1.20	3.80	1.71	1.29	3.38			
n					52	52	54	52	52	52	52	54	51	51	12	12	12			
Std. Dev.					1.11	1.05	1.16	0.083	0.067	0.733	0.654	0.63	0.48	1.35	0.51	0.21	1.20			
Min					0.223	<0.010	<0.09	<0.015	<0.010	0.051	0.08	<0.09	0.18	1.54	1.09	0.93	1.57			
Max					4.49	4.11	5.00	0.321	0.261	4.49	3.88	3.94	2.52	6.91	2.68	1.68	5.67			
Total Loadings From WWTP, kg/yr					423	363.9	443	22	17.1	105	105.5	127	258	815	366.3	277.2	724.7			
Loadings From WWTP To River, kg/yr					264	227.0	277	13	10.7	65	65.8	79	161	509	228.5	172.9	452.1			

Okanagan Falls Advanced Wastewater Treatment Facility

DATE	TIME (24HR)	*DAILY/WEEKLY/ MONTHLY/QUARTERLY/RE-SAMPLE	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	TEMP (HACH) or In-situ	TEMP - pH MEASURED AT (RDOS)	pH Grab (RDOS) In-situ online probe	pH Grab (CARO)	TSS (RDOS)	TSS (CARO)	TSS MAC	FECAL COLIFORMS (CARO)	E. COLI (CARO)	E. COLI MAC (Apr 15-Oct 15)	E. COLI MAC (Oct 16-Apr 14)
dd/mm/yr	HR:MIN	D/W/M/Q			°C	°C			mg/L	mg/L	mg/L	MPN/100ml	MPN/100ml	CFU/100ml	CFU/100ml
06-Jan-21	11:10	W	KM	KM	11.9	11.9	6.93		2.1	2.4	10	<1	<1		50
13-Jan-21	10:36	W	KM	KM	11.7	11.7	6.97		2.4	<2.0	10	<1	<1		50
20-Jan-21	11:20	Q	KM	KM	11.2	11.2	6.86	7.49	1.6	2.2	10	<1	<1		50
27-Jan-21	13:15	W	KM	KM	10.8	10.8	6.98		4.0	<2.0	10	<1	<1		50
03-Feb-21	10:53	W	KM	KM	11.4	11.4	6.98		1.1	3.4	10	<1	<1		50
09-Feb-21	10:40	W	KM	KM	10.1	10.1	6.94		2.2	<2.0	10	<1	<1		50
17-Feb-21	10:30	M	KM	KM	10.1	10.1	7.10	7.75	1.3	2.6	10	<1	<1		50
23-Feb-21	9:50	W	KM	KM	10.8	10.8	7.09		<1	2	10	<1	<1		50
03-Mar-21	10:43	W	KM	KM	11.4	11.4	7.03		4.1	3.4	10	<1	<1		50
09-Mar-21	10:55	W	KM	KM	11.7	11.7	7.05		2.1	4	10	6	6		50
16-Mar-21	10:43	W	KM	KM	11.7	11.7	7.05		1.7	2	10	<1	<1		50
24-Mar-21	10:30	M	KM	KM	12.3	12.3	7.04	7.70	2.1	<2	10	<1	<1		50
30-Mar-21	11:33	W	RS	KM	12.5	12.5	7.05			2	10	<1	<1		50
06-Apr-21	11:25	W	KM	KM	13.4	13.4	7.07		2.3	<2	10	<1	<1		50
14-Apr-21	10:37	W	KM	KM	13.2	13.2	7.06		2.0	2	10	<1	<1		50
20-Apr-21	11:30	Q	KM	KM	14.7	14.7	7.08	7.71	1.5	<2	10	<1	<1	2.2	
28-Apr-21	12:35	W	KM	KM	15.5	15.5	7.04		1.7	<2	10	<1	<1	2.2	
05-May-21	13:03	W	KM	KM	15.9	15.9	6.99		<1	<2	10	<1	<1	2.2	
11-May-21	11:52	W	KM	KM	16.4	16.4	6.94		<1	<2	10	<1	<1	2.2	
18-May-21	11:20	M	KM	KM	17.6	17.6	6.90	7.1	2.3	3.1	10	<1	<1	2.2	
26-May-21	10:22	W	KM	KM	18.0	18.0	6.94		3.6	<2.0	10	<1	<1	2.2	
02-Jun-21	10:23	W	KM	KM	19.4	19.4	6.96		1.5	<2.0	10	<1	<1	2.2	
09-Jun-21	10:20	W	KM	KM	18.4	18.4	6.95		1.7	<2.0	10	<1	<1	2.2	
16-Jun-21	10:18	M	KM	KM	19.0	19.0	6.86	7.97	1.2	<2.0	10	<1	<1	2.2	
21-Jun-21	9:55	Bioassay	KM		19.1	19.1	6.91								
22-Jun-21	10:10	W	KM	KM	20.2	20.2	6.90		<1	<2.0	10	<1	<1	2.2	
28-Jun-21	12:53	W	KM	KM	23.0	23.0	6.86		<1	<2.0	10	<1	<1	2.2	
06-Jul-21	11:43	W	SC	SC	23.2	23.2	6.86			<2.0	10	<1	<1	2.2	
12-Jul-21	10:38	W	KM	KM	23.4	23.4	6.86		<1	<2.0	10	1	<1	2.2	
21-Jul-21	10:10	Q	KM	KM	22.8	22.8	6.90	7.91	<1	<2.7	10	<1	<1	2.2	
27-Jul-21	11:10	W	CH	CH	23.3	23.3	6.90			<2.0	10	<1	<1	2.2	
04-Aug-21	10:30	W	KM	KM	23.6	23.6	6.90		1.0	<2.0	10	2	1	2.2	
10-Aug-21	11:58	M	KM	KM	23.0	23.0	6.91	7.79	<1	<2.0	10	1	1	2.2	

Okanagan Falls Advanced Wastewater Treatment Facility

DATE	TIME (24HR)	*DAILY/WEEKLY/ MONTHLY/QUARTERLY/RE-SAMPLE	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	TEMP (HACH) or In-situ	TEMP - pH MEASURED AT (RDOS)	pH Grab (RDOS) In-situ online probe	pH Grab (CARO)	TSS (RDOS)	TSS (CARO)	TSS MAC	FECAL COLIFORMS (CARO)	E. COLI (CARO)	E. COLI MAC (Apr 15-Oct 15)	E. COLI MAC (Oct 16-Apr 14)
dd/mm/yr	HR:MIN	D/W/M/Q			°C	°C			mg/L	mg/L	mg/L	MPN/100ml	MPN/100ml	CFU/100ml	CFU/100ml
18-Aug-21	12:02	W	KM	KM	22.4	22.4	6.86		1.6	<2.0	10	1	1	2.2	
25-Aug-21	11:25	W	KM	KM	21.7	21.7	6.86		<1	<2.0	10			2.2	
27-Aug-21	13:40	Coliform only	RS		22.1	22.1	6.86				10	<1	<1	2.2	
31-Aug-21	11:50	W	KM	KM	21.6	21.6	6.85		<1	<2.0	10	1	1	2.2	
07-Sep-21	13:25	W	KM	KM	21.7	21.7	6.91		<1	<2.0	10	<1	<1	2.2	
13-Sep-21	12:05	W	KM	KM	21.7	21.7	6.89		<1	<2.0	10	<1	<1	2.2	
21-Sep-21	11:55	M	KM	KM	20.2	20.2	6.91	7.65	<1	<2.0	10	<1	<1	2.2	
28-Sep-21	11:10	W	KM	KM	19.9	19.9	6.84		<1	<2.0	10	<1	<1	2.2	
04-Oct-21	10:40	W	KM	KM	19.1	19.1	6.91		<1	<2.0	10	1	1	2.2	
13-Oct-21	11:45	W	RS	RS/KM	17.4	17.4	6.91			<2.0	10	<1	<1	2.2	
19-Oct-21	10:30	Q	KM	KM	17.6	17.6	6.89	7.74	1.2	<2.0	10	1	<1		50
25-Oct-21	10:28	W	KM/CH	KM	17.1	17.1	6.89		<1	<2.0	10	<1	<1		50
01-Nov-21	11:00	W	KM	KM	15.2	15.2	6.89		1.3	<2.0	10	<1	<1		50
08-Nov-21	10:45	W	KM	KM	15.6	15.6	6.86			<2.0	10	28	2		50
15-Nov-21	13:33	W	RS	RS/KM	15.3	15.3	6.90			<2.0	10	<1	<1		50
22-Nov-21	11:12	M	KM	KM	13.9	13.9	6.89	7.66	1.5	<2.0	10	1	1		50
29-Nov-21	13:10	W	KM	KM	14.4	14.4	6.88		1.7	<2.0	10	<1	<1		50
07-Dec-21	11:33	M	KM	KM	13.2	13.2	6.86	7.66	<1	<2.0	10	<1	<1		50
13-Dec-21	10:25	W	KM	KM	12.8	12.8	6.82		2.9	2.6	10	1	<1		50
20-Dec-21	10:25	W	KM	KM	11.4	11.4	6.79		1.5	<2.0	10	<1	<1		50
28-Dec-21	10:15	W	KM	KM	8.7	8.7	6.94		2.0	<2.0	10	1	<1		50
	Average				16.6	16.6	6.93	7.68	1.6	1.4		1	1		
	n				54	54	54	12	46	52		52	52		
	Std. Dev.				4.5	4.5	0.08	0.22	0.8	0.8		4	1		
	Min				8.7	8.7	6.79	7.10	1.0	<2.0		<1	<1		
	Max				23.6	23.6	7.10	7.97	4.1	4.0		28	6		
Total Loadings From WWTP, kg/yr									343	300.2					
Loadings From WWTP To River, kg/yr									214	187.3					

24 hour Averages from 0:00 hrs to 24:00 hrs

DATE	WEDECO	CHEMSCAN			HACH		
	Transmittance @ 254 nm	Transmittance @ 440 nm	ORTHOPHOSPHATE as P	NITRATE + NITRITE as N	AMMONIUM as N	TEMPERATURE	pH
dd/mm/yr	% [1cm]	%UVT	mg/L	mg/L	mg/L	°C	
01-Jan-21	75.60	90.3	0.05	1.85	1.01	11.4	6.91
02-Jan-21	75.57	90.2	0.05	1.85	1.08	11.4	6.94
03-Jan-21	75.12	90.4	0.05	1.84	0.85	11.6	6.94
04-Jan-21	75.59	90.4	0.05	1.72	0.70	11.7	6.96
05-Jan-21	76.08	90.4	0.05	1.70	0.40	11.7	6.98
06-Jan-21	75.56	90.3	0.05	3.08	0.53	11.8	6.94
07-Jan-21	75.52	90.7	0.05	3.53	0.56	11.8	6.90
08-Jan-21	76.25	91.4	0.05	3.33	0.59	11.7	6.91
09-Jan-21	76.72	91.6	0.05	3.28	0.76	11.6	6.89
10-Jan-21	76.86	91.5	0.05	2.65	1.00	11.5	6.91
11-Jan-21	76.92	91.7	0.05	2.74	0.78	11.5	6.92
12-Jan-21	77.11	91.8	0.05	2.89	0.48	11.5	6.95
13-Jan-21	77.17	91.7	0.05	3.03	0.52	11.6	6.95
14-Jan-21	77.29	91.7	0.05	3.46	0.55	11.6	6.91
15-Jan-21	77.50	91.2	0.05	3.27	0.64	11.4	6.89
16-Jan-21	77.40	90.7	0.05	3.03	0.81	11.2	6.89
17-Jan-21	76.89	90.4	0.05	2.64	1.15	11.2	6.91
18-Jan-21	76.60	89.9	0.05	2.45	1.11	11.4	6.91
19-Jan-21	80.43	92.1	0.05	3.03	0.80	11.3	6.87
20-Jan-21	80.93	92.5	0.05	2.99	0.80	11.1	6.87
21-Jan-21	80.93	92.5	0.05	3.06	0.88	10.8	6.89
22-Jan-21	80.89	91.8	0.06	3.34	1.11	10.4	6.91
23-Jan-21	80.84	91.4	0.05	3.72	1.27	10.0	6.92
24-Jan-21	80.75	90.9	0.05	3.39	1.39	10.1	6.93
25-Jan-21	80.84	90.7	0.05	2.64	1.31	10.4	6.95
26-Jan-21	80.17	90.3	0.05	2.69	0.87	10.6	6.97
27-Jan-21	78.88	90.0	0.05	2.70	0.76	10.7	6.96
28-Jan-21	78.12	89.7	0.05	3.04	0.71	10.7	6.96
29-Jan-21	77.86	89.7	0.05	3.07	0.56	11.0	6.96
30-Jan-21	77.52	89.6	0.05	3.13	0.60	11.0	6.97
31-Jan-21	77.05	89.2	0.05	3.26	0.73	11.0	6.98
01-Feb-21	76.48	89.2	0.05	3.14	0.55	11.3	6.99
02-Feb-21	76.43	89.0	0.05	3.12	0.42	11.5	6.98
03-Feb-21	77.32	90.3	0.05	3.63	0.41	11.4	6.95
04-Feb-21	77.99	91.3	0.05	3.89	0.35	11.3	6.93
05-Feb-21	77.72	91.4	0.05	4.46	0.40	11.4	6.92
06-Feb-21	77.17	91.2	0.05	4.50	0.59	11.5	6.93
07-Feb-21	76.93	91.1	0.05	4.35	0.84	11.4	6.94
08-Feb-21	76.89	91.3	0.05	4.16	0.88	10.9	6.97
09-Feb-21	77.35	91.0	0.05	4.51	0.62	10.1	6.94
10-Feb-21	77.55	89.8	0.05	3.79	1.17	9.4	6.86
11-Feb-21	77.41	89.6	0.06	4.46	1.53	8.7	6.89
12-Feb-21	78.20	90.1	0.06	4.28	1.29	8.4	6.98
13-Feb-21	78.25	90.9	0.05	4.30	1.13	8.6	7.11
14-Feb-21	77.85	91.4	0.05	3.69	1.50	9.1	7.14
15-Feb-21	77.41	91.4	0.05	3.79	1.78	9.6	7.14
16-Feb-21	76.99	91.5	0.05	3.49	1.68	9.9	7.14
17-Feb-21	76.01	91.1	0.06	4.07	1.15	10.1	7.09
18-Feb-21	75.65	90.7	0.05	4.42	0.98	10.1	7.04
19-Feb-21	76.24	90.8	0.06	4.17	0.86	10.1	7.06
20-Feb-21	76.28	90.9	0.05	3.68	1.28	10.3	7.09
21-Feb-21	75.52	90.7	0.05	3.27	2.38	10.3	7.11
22-Feb-21	75.51	90.8	0.06	3.09	1.92	10.6	7.13
23-Feb-21	75.30	90.9	0.07	3.45	1.51	10.8	7.11

24 hour Averages from 0:00 hrs to 24:00 hrs

DATE	WEDECO	CHEMSCAN			HACH		
	Transmittance @ 254 nm	Transmittance @ 440 nm	ORTHOPHOSPHATE as P	NITRATE + NITRITE as N	AMMONIUM as N	TEMPERATURE	pH
dd/mm/yr	% [1cm]	%UVT	mg/L	mg/L	mg/L	°C	
24-Feb-21	75.21	90.9	0.06	3.39	1.59	10.9	7.10
25-Feb-21	75.19	90.4	0.05	3.42	1.58	10.7	7.11
26-Feb-21	74.93	90.3	0.06	2.25	2.85	10.9	7.12
27-Feb-21	74.16	89.6	0.06	1.52	5.09	10.9	7.14
28-Feb-21	73.64	89.0	0.06	2.19	5.54	10.9	7.14
01-Mar-21	73.39	88.8	0.05	2.73	4.71	11.1	7.12
02-Mar-21	72.77	88.5	0.05	3.04	2.97	11.4	7.07
03-Mar-21	71.10	86.3	0.10	3.27	2.55	11.4	7.06
04-Mar-21	71.17	85.9	0.05	2.96	1.68	11.3	7.06
05-Mar-21	71.63	86.1	0.05	3.15	0.79	11.5	7.06
06-Mar-21	70.97	85.4	0.06	2.81	1.01	11.8	7.06
07-Mar-21	69.98	85.3	0.08	2.76	1.79	11.7	7.07
08-Mar-21	70.91	86.2	0.05	2.08	1.33	11.6	7.08
09-Mar-21	71.05	86.3	0.05	1.92	0.82	11.6	7.06
10-Mar-21	71.04	85.8	0.09	2.01	0.68	11.6	7.06
11-Mar-21	71.48	86.5	0.06	2.35	0.59	11.5	7.04
12-Mar-21	67.12	87.2	0.07	2.35	0.65	11.5	7.05
13-Mar-21	76.74	89.3	0.05	2.67	0.96	11.6	7.06
14-Mar-21	78.39	89.6	0.05	2.07	1.19	11.8	7.06
15-Mar-21	79.09	90.8	0.05	1.87	0.99	11.8	7.07
16-Mar-21	79.81	91.8	0.07	1.66	0.59	11.8	7.05
17-Mar-21	79.91	90.9	0.15	2.14	0.61	11.8	7.02
18-Mar-21	79.56	89.9	0.11	1.75	1.02	12.1	7.03
19-Mar-21	79.56	91.3	0.06	1.82	1.14	12.4	7.03
20-Mar-21	79.29	91.8	0.05	1.31	1.02	12.4	7.03
21-Mar-21	79.66	92.0	0.05	1.78	1.16	12.3	7.03
22-Mar-21	80.15	92.2	0.05	1.70	0.84	12.3	7.04
23-Mar-21	80.59	92.7	0.06	1.49	0.42	12.3	7.04
24-Mar-21	80.37	92.5	0.06	1.41	0.36	12.5	7.03
25-Mar-21	79.38	92.3	0.05	1.41	0.43	12.5	7.03
26-Mar-21	79.40	92.3	0.05	1.92	0.41	12.6	7.02
27-Mar-21	79.99	92.4	0.05	1.98	0.49	12.7	7.02
28-Mar-21	80.01	92.3	0.05	1.45	0.66	12.8	7.03
29-Mar-21	80.37	92.8	0.05	1.23	0.47	12.3	7.07
30-Mar-21	79.62	91.6	0.09	1.51	0.52	12.4	7.03
31-Mar-21	79.63	91.3	0.06	1.50	0.46	12.6	7.03
01-Apr-21	80.22	92.2	0.05	1.46	0.36	12.8	7.04
02-Apr-21	79.95	92.1	0.05	1.42	0.53	13.0	7.03
03-Apr-21	79.83	92.5	0.05	1.11	0.64	13.3	7.03
04-Apr-21	79.63	92.4	0.05	1.09	0.73	13.3	7.03
05-Apr-21	79.54	92.3	0.05	0.87	0.60	13.3	7.03
06-Apr-21	79.67	92.4	0.05	0.49	0.35	13.4	7.05
07-Apr-21	79.38	92.0	0.05	0.54	0.41	13.6	7.04
08-Apr-21	80.00	92.6	0.05	0.74	0.32	13.5	7.04
09-Apr-21	80.33	93.1	0.05	1.09	0.33	13.3	7.04
10-Apr-21	80.25	93.3	0.05	1.24	0.39	13.1	7.02
11-Apr-21	80.33	93.4	0.05	1.05	0.46	13.0	7.03
12-Apr-21	80.66	93.3	0.05	0.93	0.35	13.0	7.05
13-Apr-21	80.85	93.7	0.05	0.97	0.30	13.2	7.05
14-Apr-21	80.81	94.0	0.05	0.98	0.31	13.3	7.04
15-Apr-21	80.21	92.8	0.06	0.92	0.34	13.6	7.02
16-Apr-21	79.76	93.4	0.05	0.97	0.30	13.9	7.01
17-Apr-21	79.05	93.2	0.05	0.97	0.33	14.2	7.01
18-Apr-21	77.96	92.9	0.05	1.04	0.42	14.4	7.01

24 hour Averages from 0:00 hrs to 24:00 hrs

DATE	WEDECO	CHEMSCAN			HACH		
	Transmittance @ 254 nm	Transmittance @ 440 nm	ORTHO PHOSPHATE as P	NITRATE + NITRITE as N	AMMONIUM as N	TEMPERATURE	pH
dd/mm/yr	% [1cm]	%UVT	mg/L	mg/L	mg/L	°C	
19-Apr-21	77.66	93.0	0.05	0.94	0.27	14.5	7.04
20-Apr-21	77.46	93.0	0.05	0.83	0.22	14.6	7.02
21-Apr-21	77.51	92.8	0.05	0.65	0.26	14.7	7.00
22-Apr-21	77.61	92.9	0.05	0.74	0.19	14.8	6.97
23-Apr-21	77.34	92.8	0.05	0.61	0.21	14.8	6.97
24-Apr-21	77.25	92.7	0.05	0.58	0.36	15.0	6.96
25-Apr-21	76.65	92.7	0.05	0.92	0.56	15.0	6.95
26-Apr-21	76.68	92.8	0.05	0.69	0.31	14.9	6.98
27-Apr-21	76.24	92.7	0.05	0.36	0.25	15.0	6.96
28-Apr-21	76.61	92.6	0.05	0.31	0.61	15.2	6.96
29-Apr-21	76.13	91.6	0.07	0.49	2.18	15.5	6.97
30-Apr-21	77.15	92.5	0.05	0.64	0.56	15.8	6.94
01-May-21	77.01	92.3	0.05	0.58	0.32	15.8	6.94
02-May-21	76.73	93.3	0.05	0.86	0.96	15.6	6.93
03-May-21	76.74	93.7	0.05	1.02	0.92	15.6	6.93
04-May-21	76.83	93.9	0.05	1.15	0.25	15.6	6.91
05-May-21	77.32	94.2	0.05	1.37	0.30	15.7	6.92
06-May-21	76.78	93.0	0.06	1.18	0.79	15.9	6.94
07-May-21	77.25	93.1	0.05	1.10	0.70	15.8	6.93
08-May-21	77.29	92.9	0.05	0.97	0.44	15.7	6.92
09-May-21	76.51	92.6	0.06	1.05	1.29	15.7	6.93
10-May-21	76.77	92.8	0.05	1.08	1.62	16.0	6.91
11-May-21	76.63	92.6	0.05	1.02	0.41	16.3	6.88
12-May-21	77.08	92.8	0.05	0.98	0.34	16.3	6.85
13-May-21	77.08	92.8	0.05	1.23	0.27	16.5	6.85
14-May-21	77.12	92.9	0.05	1.06	0.38	16.7	6.88
15-May-21	77.61	92.8	0.05	0.82	0.59	17.0	6.90
16-May-21	77.15	92.6	0.07	0.56	1.69	17.4	6.92
17-May-21	76.80	91.9	0.06	0.63	1.61	17.7	6.93
18-May-21	76.78	92.5	0.05	0.56	0.44	17.5	6.90
19-May-21	77.07	92.7	0.05	1.10	0.28	17.1	6.90
20-May-21	77.09	92.4	0.05	1.82	0.46	16.9	6.89
21-May-21	76.85	92.3	0.06	1.67	0.48	16.8	6.90
22-May-21	76.88	92.9	0.05	1.12	0.44	17.0	6.91
23-May-21	76.79	92.9	0.05	1.17	0.62	17.3	6.92
24-May-21	76.49	91.3	0.05	1.59	1.47	17.6	6.93
25-May-21	61.52	92.4	0.05	1.27	0.92	17.8	6.93
26-May-21	61.92	92.9	0.05	1.16	0.24	18.0	6.93
27-May-21	64.35	92.7	0.06	1.51	0.44	17.9	6.93
28-May-21	44.89	93.5	0.05	0.95	0.27	17.9	6.95
29-May-21	45.50	93.7	0.05	1.76	2.49	17.8	6.93
30-May-21	45.59	93.7	0.05	1.46	0.88	18.0	6.92
31-May-21	59.73	93.4	0.07	0.99	0.90	18.4	6.91
01-Jun-21	71.43	93.2	0.05	0.69	0.42	19.0	6.91
02-Jun-21	78.49	93.3	0.05	0.87	0.45	19.5	6.92
03-Jun-21	78.68	92.7	0.07	1.32	0.56	19.9	6.92
04-Jun-21	78.88	93.2	0.05	1.12	0.30	20.0	6.94
05-Jun-21	79.57	93.7	0.05	1.28	0.33	19.6	6.98
06-Jun-21	79.31	93.7	0.05	1.80	0.62	18.9	6.99
07-Jun-21	78.99	93.9	0.05	2.21	0.56	18.5	6.97
08-Jun-21	78.66	94.2	0.05	2.23	0.20	18.3	6.96
09-Jun-21	78.46	94.3	0.05	2.39	0.27	18.3	6.95
10-Jun-21	78.21	94.3	0.09	2.40	0.30	18.5	6.96
11-Jun-21	79.52	94.0	0.07	2.74	0.49	18.4	6.97

24 hour Averages from 0:00 hrs to 24:00 hrs

DATE	WEDECO	CHEMSCAN			HACH		
	Transmittance @ 254 nm	Transmittance @ 440 nm	ORTHOPHOSPHATE as P	NITRATE + NITRITE as N	AMMONIUM as N	TEMPERATURE	pH
dd/mm/yr	% [1cm]	%UVT	mg/L	mg/L	mg/L	°C	
12-Jun-21	78.82	93.3	0.06	2.59	0.88	18.6	6.94
13-Jun-21	79.14	93.3	0.05	2.85	0.76	18.9	6.92
14-Jun-21	80.04	93.4	0.11	2.63	0.45	18.9	6.93
15-Jun-21	80.32	93.6	0.06	2.28	0.19	19.0	6.93
16-Jun-21	79.86	93.5	0.05	2.46	0.39	19.1	6.91
17-Jun-21	80.75	94.0	0.06	2.58	0.56	19.1	6.91
18-Jun-21	80.93	94.6	0.07	2.47	0.85	19.1	6.91
19-Jun-21	80.93	94.9	0.07	2.86	0.68	19.1	6.91
20-Jun-21	80.93	95.3	0.13	2.19	1.54	19.1	6.91
21-Jun-21	80.93	95.3	0.11	2.33	1.18	19.1	6.91
22-Jun-21	80.93	95.6	0.08	1.66	0.28	20.2	6.93
23-Jun-21	80.93	95.9	0.14	2.94	0.21	21.1	6.84
24-Jun-21	80.92	96.0	0.14	3.72	0.20	21.3	6.79
25-Jun-21	80.93	96.0	0.15	3.79	0.20	21.6	6.79
26-Jun-21	80.92	96.2	0.13	3.85	0.19	22.0	6.78
27-Jun-21	80.92	96.3	0.14	3.80	0.17	22.4	6.77
28-Jun-21	80.92	96.2	0.14	3.03	0.14	22.8	6.77
29-Jun-21	80.92	96.1	0.14	2.64	0.13	23.2	6.77
30-Jun-21	80.92	95.6	0.15	2.79	0.12	23.5	6.76
01-Jul-21	80.93	95.5	0.14	4.80	0.14	23.6	6.75
02-Jul-21	80.92	95.1	0.12	5.11	0.14	23.4	6.84
03-Jul-21	80.93	94.8	0.11	5.25	0.25	23.4	6.85
04-Jul-21	80.93	94.5	0.10	5.66	0.45	23.2	6.85
05-Jul-21	80.93	94.2	0.10	4.72	0.38	23.1	6.87
06-Jul-21	80.93	94.1	0.11	4.48	0.28	23.2	6.86
07-Jul-21	80.93	94.1	0.09	5.03	0.29	23.1	6.85
08-Jul-21	80.93	94.1	0.10	5.19	0.22	22.9	6.85
09-Jul-21	80.92	94.3	0.09	4.45	0.15	22.9	6.86
10-Jul-21	80.93	94.5	0.11	3.39	0.12	23.2	6.87
11-Jul-21	80.92	94.3	0.11	3.38	0.12	23.3	6.86
12-Jul-21	80.91	94.2	0.13	3.38	0.13	23.4	6.87
13-Jul-21	80.92	93.9	0.11	3.74	0.13	23.5	6.88
14-Jul-21	80.92	93.9	0.11	3.56	0.13	23.6	6.86
15-Jul-21	80.93	94.2	0.12	3.39	0.14	23.5	6.89
16-Jul-21	80.93	94.4	0.13	3.29	0.17	23.5	6.89
17-Jul-21	80.93	94.4	0.11	3.52	0.17	23.3	6.89
18-Jul-21	80.93	94.4	0.11	3.55	0.15	23.4	6.88
19-Jul-21	80.92	94.3	0.13	3.50	0.24	23.4	6.86
20-Jul-21	80.92	94.3	0.11	2.90	0.17	23.2	6.89
21-Jul-21	80.92	94.9	0.12	3.28	0.19	22.9	6.89
22-Jul-21	80.93	95.2	0.12	3.62	0.21	22.7	6.86
23-Jul-21	80.93	95.2	0.09	3.29	0.18	22.7	6.86
24-Jul-21	80.93	95.3	0.11	3.18	0.18	22.9	6.85
25-Jul-21	80.93	95.4	0.11	2.79	0.19	23.1	6.84
26-Jul-21	80.93	95.3	0.12	2.35	0.22	23.1	6.86
27-Jul-21	80.93	95.4	0.11	1.96	0.18	23.2	6.88
28-Jul-21	80.93	95.3	0.11	2.30	0.17	23.3	6.87
29-Jul-21	80.93	95.3	0.12	2.76	0.18	23.3	6.85
30-Jul-21	80.93	95.3	0.11	2.77	0.17	23.4	6.85
31-Jul-21	80.77	95.1	0.12	2.78	0.20	23.5	6.85
01-Aug-21	80.93	94.8	0.11	3.27	0.22	23.4	6.85
02-Aug-21	80.89	94.2	0.12	3.46	0.25	23.5	6.85
03-Aug-21	80.92	94.5	0.13	2.76	0.27	23.5	6.86
04-Aug-21	80.93	95.1	0.13	2.58	0.19	23.7	6.85

24 hour Averages from 0:00 hrs to 24:00 hrs

DATE	WEDECO	CHEMSCAN			HACH		
	Transmittance @ 254 nm	Transmittance @ 440 nm	ORTHOPHOSPHATE as P	NITRATE + NITRITE as N	AMMONIUM as N	TEMPERATURE	pH
dd/mm/yr	% [1cm]	%UVT	mg/L	mg/L	mg/L	°C	
05-Aug-21	80.93	95.2	0.20	3.16	0.80	23.7	6.89
06-Aug-21	80.93	95.5	0.13	2.83	0.39	23.6	6.84
07-Aug-21	80.93	95.3	0.09	4.10	0.15	23.4	6.97
08-Aug-21	80.93	95.0	0.08	3.81	0.17	22.9	6.91
09-Aug-21	80.92	94.8	0.09	2.95	0.31	22.7	6.89
10-Aug-21	80.92	94.9	0.08	2.01	0.34	22.9	6.89
11-Aug-21	80.93	95.3	0.15	1.78	0.60	23.3	6.86
12-Aug-21	80.93	95.5	0.09	2.05	0.34	23.3	6.88
13-Aug-21	80.93	95.5	0.10	2.68	0.30	23.2	6.89
14-Aug-21	80.93	95.4	0.12	3.30	0.31	23.2	6.87
15-Aug-21	80.93	95.5	0.11	3.44	0.29	23.2	6.88
16-Aug-21	80.93	95.4	0.13	2.95	0.34	23.1	6.89
17-Aug-21	80.93	95.4	0.08	2.73	0.34	22.4	6.90
18-Aug-21	80.92	94.8	0.06	4.02	0.33	22.3	6.85
19-Aug-21	80.93	94.9	0.09	3.98	0.33	22.5	6.83
20-Aug-21	80.93	94.9	0.09	4.03	0.32	22.5	6.85
21-Aug-21	80.92	94.9	0.11	4.04	0.34	22.4	6.84
22-Aug-21	80.91	94.9	0.12	4.04	0.43	22.2	6.85
23-Aug-21	80.92	95.0	0.09	4.27	0.39	21.8	6.86
24-Aug-21	80.93	95.0	0.12	4.09	0.38	21.6	6.86
25-Aug-21	80.93	94.9	0.06	3.69	0.32	21.7	6.86
26-Aug-21	80.93	94.7	0.07	3.34	0.35	21.8	6.84
27-Aug-21	80.93	94.6	0.07	2.94	0.30	21.9	6.84
28-Aug-21	80.93	94.8	0.07	2.74	0.30	21.9	6.83
29-Aug-21	80.93	95.1	0.08	2.39	0.32	21.9	6.83
30-Aug-21	80.93	95.5	0.05	1.85	0.33	21.7	6.84
31-Aug-21	80.93	95.4	0.08	2.26	0.35	21.4	6.87
01-Sep-21	80.93	95.1	0.09	3.02	0.36	21.3	6.85
02-Sep-21	80.93	95.0	0.10	3.21	0.39	21.1	6.85
03-Sep-21	80.93	95.1	0.07	2.87	0.41	21.2	6.85
04-Sep-21	80.93	95.2	0.10	3.04	0.42	21.4	6.83
05-Sep-21	80.93	95.1	0.09	2.86	0.38	21.5	6.85
06-Sep-21	80.93	95.2	0.10	2.90	0.41	21.5	6.86
07-Sep-21	80.93	95.3	0.09	2.74	0.37	21.5	6.87
08-Sep-21	80.93	95.4	0.12	2.61	0.37	21.6	6.84
09-Sep-21	80.25	95.3	0.09	2.61	0.34	21.7	6.87
10-Sep-21	80.93	95.0	0.10	2.82	0.37	21.7	6.88
11-Sep-21	80.93	94.9	0.11	3.37	0.39	21.7	6.88
12-Sep-21	80.93	94.9	0.10	3.24	0.37	21.8	6.87
13-Sep-21	80.93	94.9	0.11	2.89	0.37	21.7	6.90
14-Sep-21	80.93	94.7	0.12	3.53	0.90	21.4	6.90
15-Sep-21	80.93	94.2	0.05	4.21	0.77	21.1	6.94
16-Sep-21	80.93	93.9	0.05	4.29	0.55	20.7	6.95
17-Sep-21	80.93	93.7	0.05	3.33	0.65	20.2	6.92
18-Sep-21	80.93	92.9	0.05	3.45	0.68	20.2	6.88
19-Sep-21	80.93	92.4	0.05	3.41	1.04	20.2	6.88
20-Sep-21	80.93	92.4	0.06	2.93	0.70	20.3	6.87
21-Sep-21	80.93	92.8	0.06	2.77	0.45	20.2	6.90
22-Sep-21	80.93	93.3	0.08	2.64	0.45	20.2	6.89
23-Sep-21	80.93	93.6	0.09	2.75	0.41	20.1	6.89
24-Sep-21	80.93	93.8	0.11	2.52	0.43	20.1	6.88
25-Sep-21	80.93	93.9	0.14	2.58	0.53	20.2	6.85
26-Sep-21	80.93	94.2	0.11	2.71	0.95	20.3	6.85
27-Sep-21	80.77	93.9	0.11	2.70	1.04	20.3	6.85

24 hour Averages from 0:00 hrs to 24:00 hrs

DATE	WEDECO	CHEMSCAN			HACH		
	Transmittance @ 254 nm	Transmittance @ 440 nm	ORTHO PHOSPHATE as P	NITRATE + NITRITE as N	AMMONIUM as N	TEMPERATURE	pH
dd/mm/yr	% [1cm]	%UVT	mg/L	mg/L	mg/L	°C	
28-Sep-21	80.93	93.8	0.08	2.60	0.69	19.9	6.86
29-Sep-21	80.93	93.9	0.06	2.90	0.34	19.5	6.89
30-Sep-21	80.93	93.9	0.05	3.39	0.32	19.2	6.92
01-Oct-21	80.93	93.8	0.06	3.28	0.34	19.1	6.90
02-Oct-21	80.93	94.1	0.06	3.61	0.32	18.9	6.91
03-Oct-21	80.93	93.9	0.06	3.96	0.54	19.0	6.91
04-Oct-21	80.93	93.9	0.05	3.61	0.45	19.1	6.93
05-Oct-21	80.93	93.7	0.09	3.17	0.55	19.2	6.93
06-Oct-21	80.93	93.7	0.06	3.08	0.78	19.0	6.93
07-Oct-21	80.93	93.5	0.06	3.41	0.55	18.7	6.93
08-Oct-21	80.93	51.3	1.11	7.55	4.69	18.4	6.89
09-Oct-21	80.93	9.4	0.08	3.40	0.45	18.0	6.91
10-Oct-21	80.93	9.4	0.08	3.40	0.45	17.8	6.93
11-Oct-21	80.93	9.4	0.08	3.40	0.45	17.6	6.93
12-Oct-21	80.93	48.6	0.07	3.42	0.62	17.3	6.93
13-Oct-21	80.93	92.8	0.05	2.59	0.75	17.4	6.91
14-Oct-21	80.93	92.3	0.06	2.46	0.73	17.3	6.92
15-Oct-21	80.93	92.7	0.07	2.92	1.14	17.3	6.92
16-Oct-21	80.93	93.2	0.05	3.57	1.12	17.4	6.93
17-Oct-21	80.93	93.3	0.05	3.19	0.96	17.7	6.90
18-Oct-21	80.93	93.3	0.05	2.43	1.03	17.7	6.90
19-Oct-21	80.93	93.1	0.05	2.12	0.78	17.5	6.91
20-Oct-21	80.93	93.2	0.05	2.46	0.60	17.4	6.88
21-Oct-21	80.93	93.3	0.05	2.44	0.61	17.3	6.87
22-Oct-21	80.93	93.1	0.05	2.64	0.62	17.3	6.86
23-Oct-21	80.93	93.3	0.05	2.38	0.83	17.3	6.86
24-Oct-21	80.93	93.4	0.05	2.15	0.90	17.2	6.88
25-Oct-21	80.93	93.0	0.05	1.77	1.45	17.1	6.89
26-Oct-21	80.93	93.0	0.05	2.29	0.58	16.9	6.89
27-Oct-21	80.93	93.0	0.05	2.67	0.48	16.8	6.86
28-Oct-21	80.93	92.8	0.09	2.55	0.82	16.8	6.87
29-Oct-21	80.92	92.7	0.05	2.16	0.93	16.5	6.88
30-Oct-21	80.93	92.8	0.05	2.63	0.90	15.9	6.87
31-Oct-21	80.93	93.0	0.05	2.79	1.32	15.4	6.89
01-Nov-21	80.93	93.2	0.05	2.58	1.50	15.3	6.89
02-Nov-21	80.93	93.0	0.05	2.49	1.11	14.3	6.41
03-Nov-21	80.93	92.7	0.06	2.20	1.72	15.7	6.88
04-Nov-21	80.93	92.4	0.05	2.26	0.97	15.7	6.70
05-Nov-21	80.93	92.7	0.05	2.28	0.96	16.1	6.86
06-Nov-21	80.93	93.1	0.05	2.22	1.33	15.9	6.87
07-Nov-21	80.93	93.3	0.05	1.91	1.76	15.6	6.88
08-Nov-21	80.93	92.8	0.05	1.79	1.55	15.3	6.87
09-Nov-21	80.93	93.2	0.05	2.50	0.80	15.2	6.90
10-Nov-21	80.93	93.2	0.05	2.35	1.00	15.1	6.90
11-Nov-21	80.93	93.1	0.05	2.53	1.46	15.0	6.90
12-Nov-21	80.93	92.4	0.33	3.48	3.59	15.0	6.91
13-Nov-21	80.93	92.4	0.05	2.52	2.18	15.0	6.88
14-Nov-21	80.93	92.7	0.05	2.87	1.25	15.0	6.88
15-Nov-21	80.93	92.5	0.05	2.58	1.32	15.3	6.87
16-Nov-21	80.93	92.5	0.08	2.42	1.01	14.9	6.84
17-Nov-21	80.93	92.4	0.05	3.01	0.66	14.6	6.86
18-Nov-21	80.93	92.5	0.05	3.20	0.61	14.5	6.86
19-Nov-21	80.93	92.6	0.05	3.47	0.58	14.2	6.87
20-Nov-21	80.93	92.7	0.05	3.33	1.01	14.0	6.86

24 hour Averages from 0:00 hrs to 24:00 hrs

DATE	WEDECO	CHEMSCAN				HACH	
	Transmittance @ 254 nm	Transmittance @ 440 nm	ORTHO PHOSPHATE as P	NITRATE + NITRITE as N	AMMONIUM as N	TEMPERATURE	pH
dd/mm/yr	% [1cm]	%UVT	mg/L	mg/L	mg/L	°C	
21-Nov-21	80.93	92.3	0.05	2.82	1.63	13.9	6.89
22-Nov-21	80.93	92.1	0.05	2.28	1.64	13.9	6.90
23-Nov-21	80.93	91.7	0.13	2.25	1.16	14.0	6.87
24-Nov-21	80.93	91.4	0.06	2.00	1.27	13.7	6.88
25-Nov-21	80.93	91.6	0.06	2.46	1.30	13.6	6.89
26-Nov-21	80.93	91.9	0.05	2.43	0.92	13.7	6.88
27-Nov-21	80.93	91.8	0.05	2.52	1.01	13.8	6.88
28-Nov-21	80.93	92.0	0.05	2.95	1.78	14.1	6.91
29-Nov-21	80.93	91.8	0.05	1.96	2.54	14.3	6.92
30-Nov-21	80.93	90.8	0.13	1.67	1.88	14.4	6.90
01-Dec-21	80.93	91.4	0.05	1.75	1.41	14.6	6.89
02-Dec-21	80.93	91.6	0.05	3.88	0.70	14.6	6.93
03-Dec-21	80.93	91.0	0.05	2.77	0.98	14.1	6.87
04-Dec-21	80.93	90.8	0.05	2.71	1.18	13.8	6.88
05-Dec-21	80.93	90.9	0.05	2.35	1.85	13.3	6.87
06-Dec-21	80.93	90.7	0.05	2.02	2.12	13.1	6.90
07-Dec-21	80.93	90.5	0.05	1.93	1.81	13.1	6.89
08-Dec-21	80.93	90.4	0.05	2.49	1.18	12.8	6.87
09-Dec-21	80.93	90.7	0.05	2.40	1.27	12.8	6.86
10-Dec-21	80.93	90.7	0.05	1.91	1.49	12.5	6.88
11-Dec-21	80.93	90.6	0.05	2.05	1.87	12.6	6.88
12-Dec-21	80.93	90.8	0.05	1.64	2.10	12.6	6.86
13-Dec-21	80.93	90.4	0.05	1.15	2.40	12.8	6.86
14-Dec-21	80.93	90.2	0.25	0.65	2.32	12.9	6.84
15-Dec-21	80.93	90.9	0.05	0.81	1.92	12.7	6.83
16-Dec-21	80.93	90.8	0.07	1.16	1.40	12.5	6.84
17-Dec-21	80.93	91.5	0.05	1.61	1.41	11.9	6.83
18-Dec-21	80.93	91.3	0.05	1.68	1.69	11.6	6.84
19-Dec-21	80.93	91.3	0.05	1.50	2.05	11.5	6.84
20-Dec-21	80.93	91.5	0.05	1.07	2.26	11.4	6.84
21-Dec-21	80.93	91.4	0.05	0.90	2.16	11.1	6.90
22-Dec-21	80.93	91.1	0.05	0.71	2.66	11.0	6.92
23-Dec-21	80.93	90.8	0.05	0.73	2.56	11.4	6.91
24-Dec-21	80.93	90.8	0.05	0.33	2.81	11.4	6.91
25-Dec-21	80.93	90.7	0.05	0.26	3.03	10.7	6.94
26-Dec-21	80.93	90.6	0.05	0.48	3.65	9.5	6.95
27-Dec-21	80.94	90.6	0.05	0.60	4.64	8.7	6.94
28-Dec-21	80.93	90.7	0.05	0.24	5.11	8.7	6.94
29-Dec-21	80.93	91.0	0.05	0.09	6.26	8.7	6.95
30-Dec-21	80.93	90.3	0.05	0.09	7.04	9.1	6.94
31-Dec-21	80.93	90.0	0.05	0.15	5.84	9.0	6.90
Average	78.88	91.73	0.07	2.47	0.91	16.3	6.92
n	365	365	365	365	365	365	365
Std. Dev.	4.29	8.38	0.06	1.14	0.96	4.5	0.08
Min	44.89	9.40	0.05	0.09	0.12	8.4	6.41
Max	80.94	96.29	1.11	7.55	7.04	23.7	7.14
Total Loadings From WWTP, kg/yr			16	529	194		
Loadings From WWTP To River, kg/yr			10	330	121		

DATE ANALYZED	DATE COMPOSITE STARTED	LAB TESTER'S INITIALS	ORTHOPOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	TOTAL PHOSPHORUS (RDOS) ROLLING ANNUAL AVERAGE	TOTAL PHOSPHORUS MAXIMUM ANNUAL AVERAGE (OC)	TOTAL PHOSPHORUS TARGET ANNUAL AVERAGE (OC)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	NITRITE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL NITROGEN (RDOS) ROLLING ANNUAL AVERAGE	TOTAL NITROGEN MAXIMUM (OC)	TOTAL NITROGEN MAXIMUM ANNUAL AVERAGE (OC)	pH Composite (RDOS)
dd-mm-yr	dd-mm-yr		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
04-Jan-20	01-Jan-21	KM	0.05	0.167	0.147	0.20	0.010	1.08				4.68	4.82	10.0	6.0	7.59
04-Jan-20	02-Jan-21	KM	0.07	0.158	0.147	0.20	0.010	0.835				4.18	4.82	10.0	6.0	7.62
04-Jan-20	03-Jan-21	KM	0.06	0.172	0.147	0.20	0.010	0.761				4.20	4.82	10.0	6.0	7.57
06-Jan-21	04-Jan-21	KM	0.05	0.164	0.147	0.20	0.010	0.519				3.59	4.82	10.0	6.0	7.59
06-Jan-21	05-Jan-21	KM	0.07	0.187	0.147	0.20	0.010	0.209	2.17	0.105	1.18	3.66	4.81	10.0	6.0	7.57
08-Jan-21	06-Jan-21	KM	0.05	0.161	0.147	0.20	0.010	0.519				4.86	4.81	10.0	6.0	7.57
08-Jan-21	07-Jan-21	KM	0.04	0.153	0.147	0.20	0.010	0.344				5.42	4.82	10.0	6.0	7.54
11-Jan-21	08-Jan-21	KM	0.06	0.147	0.147	0.20	0.010	0.500				5.19	4.82	10.0	6.0	7.70
11-Jan-21	09-Jan-21	KM	0.07	0.151	0.147	0.20	0.010	0.697				5.38	4.82	10.0	6.0	7.73
11-Jan-21	10-Jan-21	KM	0.05	0.151	0.147	0.20	0.010	0.929				5.69	4.82	10.0	6.0	7.65
13-Jan-21	11-Jan-21	KM	0.04	0.117	0.147	0.20	0.010	0.433				4.73	4.82	10.0	6.0	7.77
13-Jan-21	12-Jan-21	KM	0.03	0.122	0.146	0.20	0.010	0.324	2.78	0.100	1.59	4.79	4.81	10.0	6.0	7.69
15-Jan-21	13-Jan-21	KM	0.06	0.122	0.147	0.20	0.010	0.345				4.64	4.81	10.0	6.0	7.68
15-Jan-21	14-Jan-21	KM	0.03	0.117	0.146	0.20	0.010	0.314				5.36	4.80	10.0	6.0	7.48
18-Jan-21	15-Jan-21	KM	0.06	0.129	0.146	0.20	0.010	0.462				5.41	4.79	10.0	6.0	7.63
18-Jan-21	16-Jan-21	KM	0.04	0.137	0.146	0.20	0.010	0.713				5.64	4.79	10.0	6.0	7.63
18-Jan-21	17-Jan-21	KM	0.11	0.220	0.147	0.20	0.010	1.13				5.95	4.78	10.0	6.0	7.6
20-Jan-21	18-Jan-21	KM	0.07	0.158	0.147	0.20	0.010	0.784				5.47	4.77	10.0	6.0	7.64
20-Jan-21	19-Jan-21	KM	0.04	0.117	0.147	0.20	0.010	0.530	3.49	0.100	1.56	5.68	4.77	10.0	6.0	7.6
22-Jan-21	20-Jan-21	KM	0.05	0.180	0.147	0.20	0.010	0.570				5.30	4.76	10.0	6.0	7.51
22-Jan-21	21-Jan-21	KM	0.04	0.110	0.147	0.20	0.010	0.656				5.61	4.76	10.0	6.0	7.47
25-Jan-21	22-Jan-21	KM	0.04	0.125	0.146	0.20	0.010	0.911				5.90	4.76	10.0	6.0	7.66
25-Jan-21	23-Jan-21	KM	0.08	0.114	0.146	0.20	0.010	1.06				6.17	4.76	10.0	6.0	7.64
25-Jan-21	24-Jan-21	KM	0.04	0.126	0.146	0.20	0.010	1.29				5.96	4.76	10.0	6.0	7.61
27-Jan-21	25-Jan-21	KM	0.04	0.135	0.146	0.20	0.010	0.566				5.27	4.76	10.0	6.0	7.51
27-Jan-21	26-Jan-21	KM	0.03	0.127	0.146	0.20	0.010	0.919	3.22	0.074	1.35	5.56	4.75	10.0	6.0	7.67
29-Jan-21	27-Jan-21	KM	0.05	0.312	0.147	0.20	0.010	0.606				5.18	4.75	10.0	6.0	7.62
29-Jan-21	28-Jan-21	KM	0.04	0.139	0.147	0.20	0.010	0.431				5.48	4.74	10.0	6.0	7.48
01-Feb-21	29-Jan-21	KM	0.04	0.145	0.147	0.20	0.010	0.381				5.59	4.74	10.0	6.0	7.75
01-Feb-21	30-Jan-21	KM	0.05	0.145	0.147	0.20	0.010	0.486				5.18	4.74	10.0	6.0	7.73
01-Feb-21	31-Jan-21	KM	0.04	0.148	0.147	0.20	0.010	0.604				5.22	4.74	10.0	6.0	7.64
03-Feb-21	01-Feb-21	KM	0.06	0.196	0.147	0.20	0.010	0.291				5.15	4.74	10.0	6.0	7.49
03-Feb-21	02-Feb-21	KM	0.05	0.178	0.147	0.20	0.010	0.258	3.21	0.026	1.37	4.86	4.74	10.0	6.0	7.64
05-Feb-21	03-Feb-21	KM	0.05	0.136	0.147	0.20	0.010	0.182				5.48	4.75	10.0	6.0	7.65
05-Feb-21	04-Feb-21	KM	0.06	0.130	0.147	0.20	0.010	0.146				5.69	4.75	10.0	6.0	7.57
08-Feb-21	05-Feb-21	KM	0.05	0.118	0.148	0.20	0.010	0.227				6.37	4.75	10.0	6.0	7.64
08-Feb-21	06-Feb-21	KM	0.06	0.133	0.148	0.20	0.010	0.505				6.35	4.75	10.0	6.0	7.58
08-Feb-21	07-Feb-21	KM	0.05	0.118	0.148	0.20	0.010	0.760				6.63	4.75	10.0	6.0	7.50
09-Feb-21	08-Feb-21	KM	0.04	0.120	0.148	0.20	0.010	0.629	4.28	0.092	1.27	6.27	4.75	10.0	6.0	7.45
12-Feb-21	09-Feb-21	KM	0.06	0.120	0.148	0.20	0.010	1.08				6.52	4.75	10.0	6.0	7.58
12-Feb-21	10-Feb-21	KM	0.06	0.131	0.148	0.20	0.010	1.12				6.53	4.75	10.0	6.0	7.47
12-Feb-21	11-Feb-21	KM	0.06	0.140	0.148	0.20	0.010	1.44				7.49	4.76	10.0	6.0	7.37
16-Feb-21	12-Feb-21	KM	0.13	0.18	0.148	0.20	0.010	0.938				7.04	4.76	10.0	6.0	7.47
16-Feb-21	13-Feb-21	KM	0.13	0.20	0.148	0.20	0.010	1.14				6.93	4.76	10.0	6.0	7.55
16-Feb-21	14-Feb-21	KM	0.13	0.18	0.149	0.20	0.010	1.48				6.73	4.77	10.0	6.0	7.49
16-Feb-21	15-Feb-21	KM	0.04	0.137	0.149	0.20	0.010	1.80	3.55	0.124	2.01	7.48	4.77	10.0	6.0	7.49
17-Feb-21	16-Feb-21	KM	0.09	0.135	0.149	0.20	0.010	1.38	3.55	0.130	1.91	6.97	4.77	10.0	6.0	7.39
19-Feb-21	17-Feb-21	KM	0.07	0.171	0.149	0.20	0.010	0.965				6.49	4.77	10.0	6.0	7.32
19-Feb-21	18-Feb-21	KM	0.07	0.160	0.149	0.20	0.010	0.789				6.75	4.78	10.0	6.0	7.50
22-Feb-21	19-Feb-21	KM	0.10	0.182	0.149	0.20	0.010	0.808				6.55	4.78	10.0	6.0	7.57
22-Feb-21	20-Feb-21	KM	0.10	0.153	0.149	0.20	0.010	1.56				7.72	4.78	10.0	6.0	7.54

DATE ANALYZED	DATE COMPOSITE STARTED	LAB TESTER'S INITIALS	ORTHOPOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	TOTAL PHOSPHORUS (RDOS) ROLLING ANNUAL AVERAGE	TOTAL PHOSPHORUS MAXIMUM ANNUAL AVERAGE (OC)	TOTAL PHOSPHORUS TARGET ANNUAL AVERAGE (OC)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	NITRITE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL NITROGEN (RDOS) ROLLING ANNUAL AVERAGE	TOTAL NITROGEN MAXIMUM (OC)	TOTAL NITROGEN MAXIMUM ANNUAL AVERAGE (OC)	pH Composite (RDOS)
dd-mm-yr	dd-mm-yr		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
22-Feb-21	21-Feb-21	KM	0.06	0.173	0.149	0.20	0.010	2.57				7.45	4.79	10.0	6.0	7.51
24-Feb-21	22-Feb-21	KM	0.05	0.154	0.150	0.20	0.010	1.27	3.28	0.144	1.80	6.49	4.80	10.0	6.0	7.40
26-Feb-21	23-Feb-21	KM	0.09	0.147	0.150	0.20	0.010	1.66				6.75	4.80	10.0	6.0	7.61
26-Feb-21	24-Feb-21	KM	0.08	0.150	0.150	0.20	0.010	1.49				6.37	4.81	10.0	6.0	7.56
26-Feb-21	25-Feb-21	KM	0.08	0.167	0.150	0.20	0.010	1.72				6.66	4.81	10.0	6.0	7.50
01-Mar-21	26-Feb-21	KM	0.10	0.200	0.150	0.20	0.010	3.25				7.85	4.82	10.0	6.0	7.72
01-Mar-21	27-Feb-21	KM	0.10	0.203	0.150	0.20	0.010	5.20				9.57	4.83	10.0	6.0	7.67
01-Mar-21	28-Feb-21	KM	0.08	0.229	0.151	0.20	0.010	5.63				10.4	4.85	10.0	6.0	7.57
03-Mar-21	01-Mar-21	KM	0.07	0.219	0.151	0.20	0.010	4.38				8.64	4.86	10.0	6.0	7.68
03-Mar-21	02-Mar-21	KM	0.06	0.225	0.151	0.20	0.010	2.97	2.84	0.200	1.63	7.64	4.86	10.0	6.0	7.56
05-Mar-21	03-Mar-21	KM	0.14	0.339	0.151	0.20	0.010	2.65				7.23	4.87	10.0	6.0	7.7
05-Mar-21	04-Mar-21	KM	0.08	0.296	0.152	0.20	0.010	1.28				6.23	4.87	10.0	6.0	7.58
08-Mar-21	05-Mar-21	KM	0.10	0.403	0.153	0.20	0.010	0.862				5.60	4.87	10.0	6.0	7.64
08-Mar-21	06-Mar-21	KM	0.13	0.284	0.153	0.20	0.010	1.35				5.76	4.87	10.0	6.0	7.64
08-Mar-21	07-Mar-21	KM	0.07	0.562	0.154	0.20	0.010	1.68				7.91	4.88	10.0	6.0	7.55
09-Mar-21	08-Mar-21	KM	0.08	0.252	0.155	0.20	0.010	1.11	2.47	0.128	1.78	5.49	4.89	10.0	6.0	7.56
12-Mar-21	09-Mar-21	KM	0.10	0.233	0.155	0.20	0.010	0.725				5.03	4.89	10.0	6.0	7.63
12-Mar-21	10-Mar-21	KM	0.14	0.293	0.156	0.20	0.010	0.618				5.14	4.89	10.0	6.0	7.57
12-Mar-21	11-Mar-21	KM	0.10	0.249	0.156	0.20	0.010	0.543				5.13	4.89	10.0	6.0	7.56
15-Mar-21	12-Mar-21	KM	0.13	0.289	0.157	0.20	0.010	0.619				5.43	4.89	10.0	6.0	7.59
15-Mar-21	13-Mar-21	KM	0.09	0.227	0.157	0.20	0.010	1.01				5.23	4.90	10.0	6.0	7.58
15-Mar-21	14-Mar-21	KM	0.10	0.238	0.157	0.20	0.010	1.15				5.11	4.90	10.0	6.0	7.58
16-Mar-21	15-Mar-21	KM	0.08	0.197	0.157	0.20	0.010	0.634	2.14	0.071	1.74	4.58	4.89	10.0	6.0	7.46
19-Mar-21	16-Mar-21	KM	0.12	0.219	0.158	0.20	0.010	0.372				4.03	4.89	10.0	6.0	7.59
19-Mar-21	17-Mar-21	KM	0.18	0.299	0.158	0.20	0.010	0.585				4.25	4.88	10.0	6.0	7.61
19-Mar-21	18-Mar-21	KM	0.14	0.274	0.159	0.20	0.010	0.946				4.48	4.88	10.0	6.0	7.57
22-Mar-21	19-Mar-21	KM	0.08	0.165	0.159	0.20	0.010	0.877				4.17	4.88	10.0	6.0	7.68
22-Mar-21	20-Mar-21	KM	0.09	0.127	0.159	0.20	0.010	0.914				3.85	4.87	10.0	6.0	7.65
22-Mar-21	21-Mar-21	KM	0.08	0.159	0.159	0.20	0.010	1.01				4.56	4.87	10.0	6.0	7.61
24-Mar-21	22-Mar-21	KM	0.08	0.146	0.159	0.20	0.010	0.419				3.87	4.87	10.0	6.0	7.83
26-Mar-21	23-Mar-21	KM	0.08	0.151	0.159	0.20	0.010	0.177	1.96	0.049	1.40	3.59	4.86	10.0	6.0	7.67
26-Mar-21	24-Mar-21	KM	0.08	0.152	0.159	0.20	0.010	0.186				3.35	4.86	10.0	6.0	7.51
26-Mar-21	25-Mar-21	KM	0.07	0.144	0.159	0.20	0.010	0.263				3.57	4.85	10.0	6.0	7.44
29-Mar-21	26-Mar-21	RS	0.06	0.124	0.159	0.20	0.010	0.251				3.67	4.85	10.0	6.0	7.52
29-Mar-21	27-Mar-21	RS	0.04	0.126	0.159	0.20	0.010	0.330				4.04	4.84	10.0	6.0	7.65
29-Mar-21	28-Mar-21	RS	0.06	0.151	0.159	0.20	0.010	0.489				3.93	4.84	10.0	6.0	7.6
01-Apr-21	29-Mar-21	RS	0.05	0.144	0.159	0.20	0.010	0.188				3.41	4.83	10.0	6.0	7.67
01-Apr-21	30-Mar-21	RS	0.10	0.193	0.159	0.20	0.010	0.354				3.48	4.83	10.0	6.0	7.62
01-Apr-21	31-Mar-21	RS	0.07	0.157	0.159	0.20	0.010	0.235				3.64	4.83	10.0	6.0	7.58
06-Apr-21	01-Apr-21	KM	0.08	0.121	0.159	0.20	0.010	0.199				3.23	4.82	10.0	6.0	7.78
06-Apr-21	02-Apr-21	KM	0.08	0.132	0.159	0.20	0.010	0.486				4.04	4.82	10.0	6.0	7.74
06-Apr-21	03-Apr-21	KM	0.08	0.125	0.159	0.20	0.010	0.486				3.91	4.81	10.0	6.0	7.67
06-Apr-21	04-Apr-21	KM	0.07	0.116	0.159	0.20	0.010	0.622				3.73	4.81	10.0	6.0	7.66
06-Apr-21	05-Apr-21	KM	0.08	0.124	0.159	0.20	0.010	0.302	1.50	0.072	1.45	3.32	4.80	10.0	6.0	7.67
09-Apr-21	06-Apr-21	KM	0.09	0.118	0.159	0.20	0.010	0.140				2.39	4.79	10.0	6.0	7.77
09-Apr-21	07-Apr-21	KM	0.06	0.123	0.159	0.20	0.010	0.217				2.63	4.79	10.0	6.0	7.71
09-Apr-21	08-Apr-21	KM	0.04	0.110	0.159	0.20	0.010	0.090				2.97	4.78	10.0	6.0	7.64
14-Apr-21	09-Apr-21	KM	0.10	0.105	0.158	0.20	0.010	0.127				2.80	4.77	10.0	6.0	7.87
14-Apr-21	10-Apr-21	KM	0.10	0.096	0.158	0.20	0.010	0.264				4.47	4.77	10.0	6.0	7.86
14-Apr-21	11-Apr-21	KM	0.09	0.097	0.158	0.20	0.010	0.269				2.89	4.77	10.0	6.0	7.8
14-Apr-21	12-Apr-21	KM	0.11	0.116	0.158	0.20	0.010	0.114				2.84	4.76	10.0	6.0	7.85

DATE ANALYZED	DATE COMPOSITE STARTED	LAB TESTER'S INITIALS	ORTHOPOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	TOTAL PHOSPHORUS (RDOS) ROLLING ANNUAL AVERAGE	TOTAL PHOSPHORUS MAXIMUM ANNUAL AVERAGE (OC)	TOTAL PHOSPHORUS TARGET ANNUAL AVERAGE (OC)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	NITRITE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL NITROGEN (RDOS) ROLLING ANNUAL AVERAGE	TOTAL NITROGEN MAXIMUM (OC)	TOTAL NITROGEN MAXIMUM ANNUAL AVERAGE (OC)	pH Composite (RDOS)
dd-mm-yr	dd-mm-yr		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
14-Apr-21	13-Apr-21	KM	0.06	0.099	0.158	0.20	0.010	0.089	1.31	0.041	1.38	2.82	4.75	10.0	6.0	7.78
16-Apr-21	14-Apr-21	KM	0.04	0.097	0.158	0.20	0.010	0.085				2.81	4.75	10.0	6.0	7.65
16-Apr-21	15-Apr-21	KM	0.07	0.165	0.158	0.20	0.010	0.108				3.07	4.74	10.0	6.0	7.67
19-Apr-21	16-Apr-21	KM	0.03	0.092	0.158	0.20	0.010	0.113				2.43	4.74	10.0	6.0	7.75
19-Apr-21	17-Apr-21	KM	0.03	0.140	0.158	0.20	0.010	0.223				2.68	4.73	10.0	6.0	7.75
19-Apr-21	18-Apr-21	KM	0.04	0.104	0.158	0.20	0.010	0.357				2.84	4.73	10.0	6.0	7.63
23-Apr-21	19-Apr-21	KM	0.05	0.103	0.158	0.20	0.010	0.106				2.24	4.72	10.0	6.0	7.59
23-Apr-21	20-Apr-21	KM	0.05	0.097	0.157	0.20	0.010	0.122				2.41	4.71	10.0	6.0	7.82
23-Apr-21	21-Apr-21	KM	0.06	0.116	0.157	0.20	0.010	0.187				2.12	4.71	10.0	6.0	7.82
23-Apr-21	22-Apr-21	KM	0.06	0.107	0.157	0.20	0.010	0.114	0.691	0.024	1.37	2.20	4.70	10.0	6.0	7.73
28-Apr-21	23-Apr-21	KM	0.07	0.123	0.157	0.20	0.010	0.140					4.70	10.0	6.0	7.74
28-Apr-21	24-Apr-21	KM	0.06	0.186	0.157	0.20	0.010	0.380					4.70	10.0	6.0	7.77
28-Apr-21	25-Apr-21	KM	0.06	0.179	0.157	0.20	0.010	0.531					4.70	10.0	6.0	7.74
28-Apr-21	26-Apr-21	KM	0.08	0.125	0.157	0.20	0.010	0.227					4.70	10.0	6.0	7.77
28-Apr-21	27-Apr-21	KM	0.06	0.117	0.157	0.20	0.010	0.180	0.509	0.026			4.70	10.0	6.0	7.59
03-May-21	28-Apr-21	RS	0.11	0.170	0.157	0.20	0.010	1.39				3.17	4.70	10.0	6.0	7.69
03-May-21	29-Apr-21	RS	0.06	0.131	0.157	0.20	0.010	1.55				3.72	4.70	10.0	6.0	7.67
03-May-21	30-Apr-21	RS	0.05	0.135	0.157	0.20	0.010	0.397				2.27	4.69	10.0	6.0	7.86
03-May-21	01-May-21	RS	0.05	0.118	0.157	0.20	0.010	0.255				2.06	4.69	10.0	6.0	7.79
03-May-21	02-May-21	RS	0.05	0.115	0.157	0.20	0.010	1.37				3.28	4.68	10.0	6.0	7.70
05-May-21	03-May-21	KM	0.07	0.124	0.157	0.20	0.010	0.381				2.48	4.68	10.0	6.0	7.70
05-May-21	04-May-21	KM	0.05	0.164	0.157	0.20	0.010	0.213	0.593	0.040	1.48	2.33	4.67	10.0	6.0	7.65
07-May-21	05-May-21	KM	0.08	0.092	0.157	0.20	0.010	0.174				2.11	4.67	10.0	6.0	7.65
07-May-21	06-May-21	KM	0.13	0.168	0.157	0.20	0.010	1.02				3.89	4.67	10.0	6.0	7.71
10-May-21	07-May-21	KM	0.05	0.098	0.156	0.20	0.010	0.362				2.71	4.66	10.0	6.0	7.84
10-May-21	08-May-21	KM	0.07	0.970	0.159	0.20	0.010	0.404				2.61	4.66	10.0	6.0	7.84
10-May-21	09-May-21	KM	0.15	0.184	0.159	0.20	0.010	2.07				4.08	4.66	10.0	6.0	7.75
11-May-21	10-May-21	KM	0.05	0.115	0.159	0.20	0.010	0.740	0.927	0.073	1.00	2.74	4.65	10.0	6.0	7.59
14-May-21	11-May-21	KM	0.07	0.108	0.159	0.20	0.010	0.333				2.06	4.65	10.0	6.0	7.83
14-May-21	12-May-21	KM	0.08	0.115	0.158	0.20	0.010	0.229				2.05	4.64	10.0	6.0	7.83
14-May-21	13-May-21	KM	0.07	0.108	0.158	0.20	0.010	0.225				2.16	4.63	10.0	6.0	7.73
17-May-21	14-May-21	KM	0.07	0.111	0.158	0.20	0.010	0.370				2.26	4.63	10.0	6.0	7.85
17-May-21	15-May-21	KM	0.07	0.110	0.158	0.20	0.010	0.587				2.57	4.63	10.0	6.0	7.87
17-May-21	16-May-21	KM	0.12	0.168	0.158	0.20	0.010	2.17				3.97	4.63	10.0	6.0	7.80
18-May-21	17-May-21	KM	0.09	0.150	0.158	0.20	0.010	0.241	0.798	0.154	1.92	3.11	4.63	10.0	6.0	7.61
20-May-21	18-May-21	KM	0.08	0.103	0.158	0.20	0.010	0.244				2.16	4.62	10.0	6.0	7.78
20-May-21	19-May-21	KM	0.07	0.107	0.158	0.20	0.010	0.185				2.33	4.62	10.0	6.0	7.79
25-May-21	20-May-21	KM	0.04	0.088	0.158	0.20	0.010	0.377				2.74	4.62	10.0	6.0	7.61
25-May-21	21-May-21	KM	0.05	0.097	0.158	0.20	0.010	0.571				2.88	4.62	10.0	6.0	7.84
25-May-21	22-May-21	KM	0.06	0.088	0.158	0.20	0.010	0.481				2.47	4.62	10.0	6.0	7.84
25-May-21	23-May-21	KM	0.05	0.088	0.157	0.20	0.010	0.789				3.04	4.62	10.0	6.0	7.79
25-May-21	24-May-21	KM	0.05	0.098	0.157	0.20	0.010	1.42				3.65	4.62	10.0	6.0	7.75
28-May-21	25-May-21	KM	0.06	0.087	0.157	0.20	0.010	0.651				2.59	4.61	10.0	6.0	7.89
28-May-21	26-May-21	KM	0.05	0.085	0.157	0.20	0.010	0.231	1.19	0.189	0.64	2.25	4.61	10.0	6.0	7.91
28-May-21	27-May-21	KM	0.09	0.111	0.157	0.20	0.010	0.620	0.883			2.53	4.61	10.0	6.0	7.87
31-May-21	28-May-21	KM	0.06	0.114	0.157	0.20	0.010	0.270				1.76	4.61	10.0	6.0	7.78
31-May-21	29-May-21	KM	0.05	0.082	0.157	0.20	0.010	0.640				2.39	4.60	10.0	6.0	7.74
31-May-21	30-May-21	KM	0.06	0.085	0.157	0.20	0.010	1.09				3.30	4.59	10.0	6.0	7.67
02-Jun-21	31-May-21	KM	0.10	0.128	0.157	0.20	0.010	0.803				3.14	4.59	10.0	6.0	7.67
02-Jun-21	01-Jun-21	KM	0.06	0.089	0.156	0.20	0.010	0.456	1.17	0.201	0.81	2.64	4.59	10.0	6.0	7.66
04-Jun-21	02-Jun-21	KM	0.09	0.107	0.156	0.20	0.010	0.446				2.73	4.58	10.0	6.0	7.61

DATE ANALYZED	DATE COMPOSITE STARTED	LAB TESTER'S INITIALS	ORTHOPOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	TOTAL PHOSPHORUS (RDOS) ROLLING ANNUAL AVERAGE	TOTAL PHOSPHORUS MAXIMUM ANNUAL AVERAGE (OC)	TOTAL PHOSPHORUS TARGET ANNUAL AVERAGE (OC)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	NITRITE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL NITROGEN (RDOS) ROLLING ANNUAL AVERAGE	TOTAL NITROGEN MAXIMUM (OC)	TOTAL NITROGEN MAXIMUM ANNUAL AVERAGE (OC)	pH Composite (RDOS)
dd-mm-yr	dd-mm-yr		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
04-Jun-21	03-Jun-21	KM	0.10	0.130	0.156	0.20	0.010	0.592				2.76	4.58	10.0	6.0	7.65
07-Jun-21	04-Jun-21	KM	0.05	0.087	0.156	0.20	0.010	0.381				2.42	4.58	10.0	6.0	7.70
07-Jun-21	05-Jun-21	KM	0.06	0.083	0.156	0.20	0.010	0.436				2.43	4.57	10.0	6.0	7.82
07-Jun-21	06-Jun-21	KM	0.05	0.079	0.156	0.20	0.010	0.798				3.42	4.57	10.0	6.0	7.81
09-Jun-21	07-Jun-21	KM	0.04	0.078	0.155	0.20	0.010	0.434				3.38	4.66	10.0	6.0	7.62
09-Jun-21	08-Jun-21	KM	0.04	0.078	0.155	0.20	0.010	0.239	1.49	0.195	1.10	3.02	4.66	10.0	6.0	7.65
11-Jun-21	09-Jun-21	KM	0.07	0.083	0.155	0.20	0.010	0.307				3.08	4.67	10.0	6.0	7.62
11-Jun-21	10-Jun-21	KM	0.14	0.187	0.155	0.20	0.010	0.450				3.60	4.67	10.0	6.0	7.59
14-Jun-21	11-Jun-21	KM	0.09	0.135	0.155	0.20	0.010	0.425				2.82	4.66	10.0	6.0	7.70
14-Jun-21	12-Jun-21	KM	0.10	0.124	0.155	0.20	0.010	1.20				3.52	4.66	10.0	6.0	7.81
14-Jun-21	13-Jun-21	KM	0.09	0.115	0.155	0.20	0.010	0.697				3.52	4.67	10.0	6.0	7.69
16-Jun-21	14-Jun-21	KM	0.12	0.169	0.155	0.20	0.010	0.400				3.70	4.66	10.0	6.0	7.69
16-Jun-21	15-Jun-21	KM	0.08	0.121	0.155	0.20	0.010	0.183	2.48	0.253	0.60	3.52	4.66	10.0	6.0	7.70
17-Jun-21	16-Jun-21	KM	0.13	0.109	0.155	0.20	0.010	0.533				4.29	4.66	10.0	6.0	7.54
21-Jun-21	17-Jun-21	KM	0.07	0.116	0.155	0.20	0.010	0.643				4.36	4.66	10.0	6.0	7.72
21-Jun-21	18-Jun-21	KM	0.11	0.140	0.155	0.20	0.010	0.984				4.84	4.66	10.0	6.0	7.59
21-Jun-21	19-Jun-21	KM	0.10	0.124	0.155	0.20	0.010	0.677				4.53	4.66	10.0	6.0	7.74
21-Jun-21	20-Jun-21	KM	0.15	0.163	0.155	0.20	0.010	1.97				5.26	4.66	10.0	6.0	7.70
22-Jun-21	21-Jun-21	KM	0.12	0.140	0.155	0.20	0.010	0.716	2.15	0.336	1.44	4.64	4.66	10.0	6.0	7.56
25-Jun-21	22-Jun-21	KM	0.15	0.190	0.156	0.20	0.010	0.154				4.88	4.66	10.0	6.0	7.89
25-Jun-21	23-Jun-21	KM	0.14	0.174	0.156	0.20	0.010	0.137				4.49	4.66	10.0	6.0	7.72
25-Jun-21	24-Jun-21	KM	0.10	0.144	0.156	0.20	0.010	0.207				3.23	4.66	10.0	6.0	7.55
28-Jun-21	25-Jun-21	KM	0.11	0.155	0.156	0.20	0.010	0.148				5.29	4.66	10.0	6.0	7.80
28-Jun-21	26-Jun-21	KM	0.12	0.160	0.156	0.20	0.010	0.129				5.00	4.66	10.0	6.0	7.75
28-Jun-21	27-Jun-21	KM	0.11	0.131	0.156	0.20	0.010	0.122	4.34	0.076	0.69	5.23	4.66	10.0	6.0	7.68
30-Jun-21	28-Jun-21	KM	0.09	0.116	0.156	0.20	0.010	0.118				4.92	4.66	10.0	6.0	7.68
30-Jun-21	29-Jun-21	KM	0.09	0.109	0.156	0.20	0.010	0.116				4.91	4.66	10.0	6.0	7.70
02-Jul-21	30-Jun-21	CH	0.07	0.109	0.156	0.20	0.010	0.126				4.93	4.65	10.0	6.0	7.73
02-Jul-21	01-Jul-21	CH	0.07	0.102	0.156	0.20	0.010	0.121				4.90	4.65	10.0	6.0	7.73
05-Jul-21	02-Jul-21	KM	0.05	0.101	0.156	0.20	0.010	0.181				5.19	4.65	10.0	6.0	7.91
05-Jul-21	03-Jul-21	KM	0.05	0.091	0.156	0.20	0.010	0.407				5.61	4.65	10.0	6.0	7.9
05-Jul-21	04-Jul-21	KM	0.07	0.092	0.156	0.20	0.010	0.562				5.75	4.65	10.0	6.0	7.77
06-Jul-21	05-Jul-21	SC	0.07	0.117	0.156	0.20	0.010	0.359	3.48	0.118	0.59	4.55	4.65	10.0	6.0	7.78
07-Jul-21	06-Jul-21	SC	0.07	0.089	0.156	0.20	0.010	0.381	3.72	0.110	0.90	5.11	4.64	10.0	6.0	7.77
09-Jul-21	07-Jul-21	KM	0.06	0.154	0.156	0.20	0.010	0.280				5.36	4.64	10.0	6.0	7.82
09-Jul-21	08-Jul-21	KM	0.07	0.102	0.156	0.20	0.010	0.235				5.73	4.64	10.0	6.0	7.72
12-Jul-21	09-Jul-21	KM	0.07	0.092	0.156	0.20	0.010	0.172				5.45	4.64	10.0	6.0	7.87
12-Jul-21	10-Jul-21	KM	0.05	0.092	0.156	0.20	0.010	0.170				5.36	4.64	10.0	6.0	7.91
12-Jul-21	11-Jul-21	KM	0.05	0.095	0.156	0.20	0.010	0.163	4.30	0.104	0.88	5.45	4.64	10.0	6.0	7.79
14-Jul-21	12-Jul-21	SC	0.08	0.102	0.156	0.20	0.010	0.167	4.11	0.086	0.61	4.97	4.64	10.0	6.0	7.79
14-Jul-21	13-Jul-21	SC	0.07	0.158	0.156	0.20	0.010	0.174	3.98	0.097	1.47	5.72	4.64	10.0	6.0	7.72
15-Jul-21	14-Jul-21	KM	0.05	0.085	0.156	0.20	0.010	0.163				4.84	4.64	10.0	6.0	7.68
19-Jul-21	15-Jul-21	KM	0.07	0.103	0.155	0.20	0.010	0.197				4.15	4.64	10.0	6.0	7.68
19-Jul-21	16-Jul-21	KM	0.07	0.114	0.155	0.20	0.010	0.212				4.03	4.64	10.0	6.0	7.77
19-Jul-21	17-Jul-21	KM	0.07	0.104	0.155	0.20	0.010	0.175				4.44	4.64	10.0	6.0	7.8
19-Jul-21	18-Jul-21	KM	0.08	0.117	0.155	0.20	0.010	0.137				4.38	4.64	10.0	6.0	7.72
21-Jul-21	19-Jul-21	KM	0.09	0.163	0.155	0.20	0.010	0.241				4.86	4.64	10.0	6.0	7.82
21-Jul-21	20-Jul-21	KM	0.08	0.108	0.155	0.20	0.010	0.128	3.29	0.068	0.27	3.76	4.64	10.0	6.0	7.78
22-Jul-21	21-Jul-21	KM	0.07	0.123	0.155	0.20	0.010	0.132				4.24	4.64	10.0	6.0	7.61
27-Jul-21	22-Jul-21	CH	0.13	0.123	0.155	0.20	0.010	0.153				4.54	4.64	10.0	6.0	8.04
27-Jul-21	23-Jul-21	CH	0.07	0.110	0.155	0.20	0.010	0.135				4.34	4.64	10.0	6.0	8.06

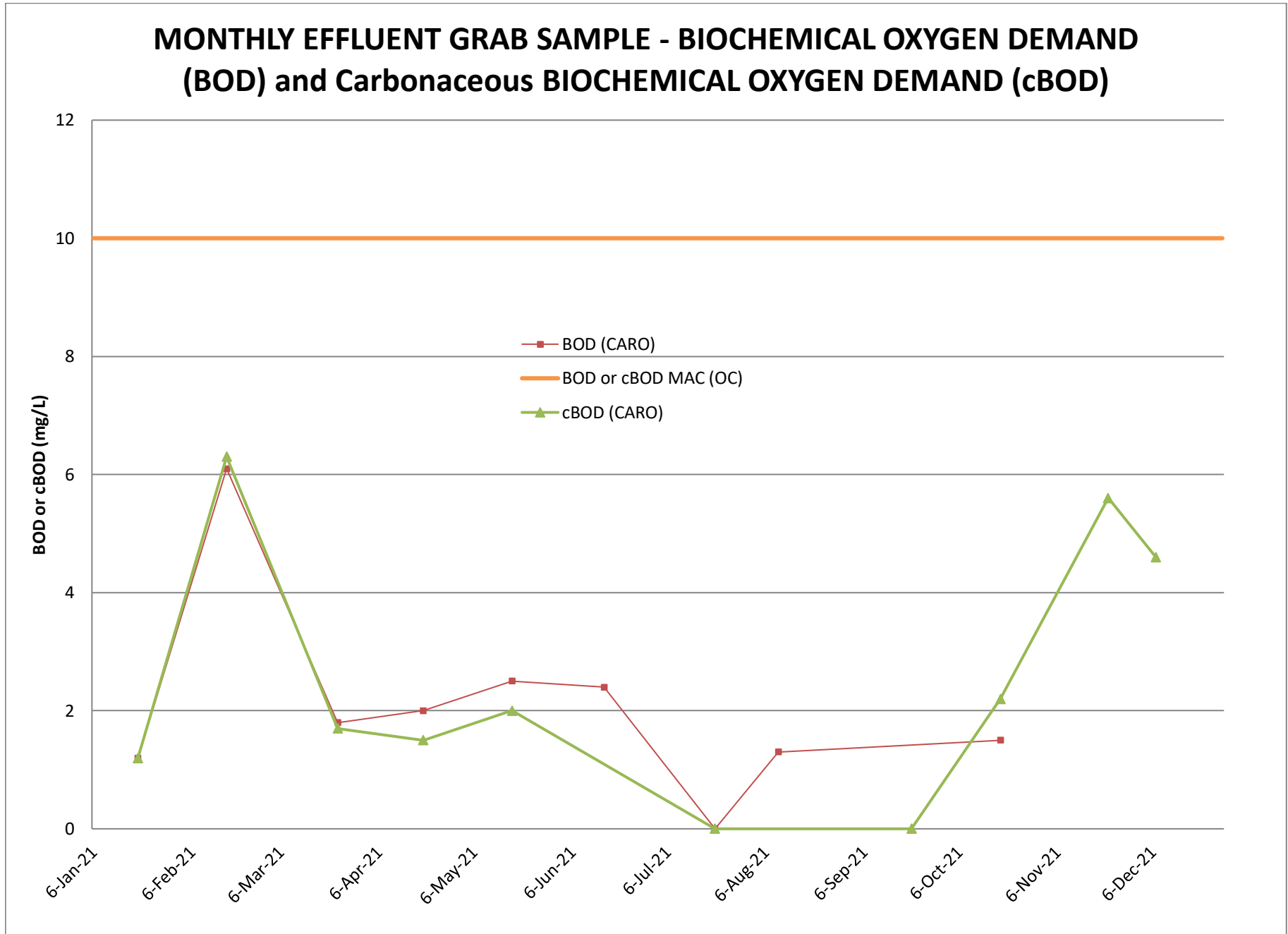
DATE ANALYZED	DATE COMPOSITE STARTED	LAB TESTER'S INITIALS	ORTHOPOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	TOTAL PHOSPHORUS (RDOS) ROLLING ANNUAL AVERAGE	TOTAL PHOSPHORUS MAXIMUM ANNUAL AVERAGE (OC)	TOTAL PHOSPHORUS TARGET ANNUAL AVERAGE (OC)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	NITRITE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL NITROGEN (RDOS) ROLLING ANNUAL AVERAGE	TOTAL NITROGEN MAXIMUM (OC)	TOTAL NITROGEN MAXIMUM ANNUAL AVERAGE (OC)	pH Composite (RDOS)
dd-mm-yr	dd-mm-yr		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
27-Jul-21	24-Jul-21	CH	0.09	0.095	0.155	0.20	0.010	0.152				4.27	4.64	10.0	6.0	8.12
27-Jul-21	25-Jul-21	CH	0.09	0.093	0.155	0.20	0.010	0.108				3.91	4.63	10.0	6.0	8.11
27-Jul-21	26-Jul-21	CH	0.08	0.095	0.155	0.20	0.010	0.189	2.81	0.080	0.59	3.67	4.63	10.0	6.0	7.98
30-Jul-21	27-Jul-21	CH	0.08	0.082	0.155	0.20	0.010	0.124				3.47	4.63	10.0	6.0	7.87
30-Jul-21	28-Jul-21	CH	0.07	0.080	0.154	0.20	0.010	0.130				3.79	4.63	10.0	6.0	7.89
30-Jul-21	29-Jul-21	CH	0.07	0.091	0.154	0.20	0.010	0.134				4.26	4.63	10.0	6.0	7.81
03-Aug-21	30-Jul-21	KM	0.07	0.082	0.154	0.20	0.010	0.144				4.11	4.63	10.0	6.0	7.72
03-Aug-21	31-Jul-21	KM	0.08	0.088	0.154	0.20	0.010	0.206				4.49	4.63	10.0	6.0	7.75
03-Aug-21	01-Aug-21	KM	0.07	0.095	0.154	0.20	0.010	0.195				4.68	4.63	10.0	6.0	7.63
03-Aug-21	02-Aug-21	KM	0.08	0.129	0.154	0.20	0.010	0.324				5.04	4.63	10.0	6.0	7.61
04-Aug-21	03-Aug-21	KM	0.08	0.119	0.154	0.20	0.010	0.245	3.33	0.061	1.60	5.24	4.63	10.0	6.0	7.44
06-Aug-21	04-Aug-21	KM	0.08	0.089	0.154	0.20	0.010	0.163				4.27	4.63	10.0	6.0	7.66
06-Aug-21	05-Aug-21	KM	0.14	0.167	0.154	0.20	0.010	0.889				5.53	4.63	10.0	6.0	7.73
09-Aug-21	06-Aug-21	KM	0.07	0.101	0.154	0.20	0.010	0.262				4.59	4.63	10.0	6.0	7.83
09-Aug-21	07-Aug-21	KM	0.07	0.073	0.154	0.20	0.010	0.137				5.49	4.64	10.0	6.0	7.82
09-Aug-21	08-Aug-21	KM	0.06	0.077	0.153	0.20	0.010	0.163				4.87	4.64	10.0	6.0	7.75
10-Aug-21	09-Aug-21	KM	0.07	0.096	0.153	0.20	0.010	0.276	3.12	0.112	0.65	4.16	4.64	10.0	6.0	7.6
13-Aug-21	10-Aug-21	KM	0.07	0.076	0.153	0.20	0.010	0.228				3.58	4.64	10.0	6.0	7.67
13-Aug-21	11-Aug-21	KM	0.12	0.119	0.153	0.20	0.010	0.484				3.90	4.65	10.0	6.0	7.73
13-Aug-21	12-Aug-21	KM	0.06	0.070	0.153	0.20	0.010	0.143				3.78	4.65	10.0	6.0	7.69
16-Aug-21	13-Aug-21	KM	0.08	0.101	0.153	0.20	0.010	0.137				4.03	4.65	10.0	6.0	7.85
16-Aug-21	14-Aug-21	KM	0.06	0.070	0.153	0.20	0.010	0.131				4.09	4.65	10.0	6.0	7.83
16-Aug-21	15-Aug-21	KM	0.07	0.082	0.152	0.20	0.010	0.127				4.45	4.66	10.0	6.0	7.71
18-Aug-21	16-Aug-21	KM	0.09	0.100	0.152	0.20	0.010	0.165				3.91	4.66	10.0	6.0	7.65
18-Aug-21	17-Aug-21	KM	0.07	0.076	0.152	0.20	0.010	0.128	2.82	0.076	0.58	3.60	4.66	10.0	6.0	7.69
20-Aug-21	18-Aug-21	KM	0.07	0.070	0.152	0.20	0.010	0.144				4.55	4.66	10.0	6.0	7.77
20-Aug-21	19-Aug-21	KM	0.10	0.102	0.152	0.20	0.010	0.136	3.68	0.058	1.20	5.07	4.67	10.0	6.0	7.69
23-Aug-21	20-Aug-21	KM	0.10	1.300	0.155	0.20	0.010	0.133				4.65	4.67	10.0	6.0	7.81
23-Aug-21	21-Aug-21	KM	0.08	0.209	0.155	0.20	0.010	0.166				5.08	4.67	10.0	6.0	7.77
23-Aug-21	22-Aug-21	KM	0.13	0.159	0.155	0.20	0.010	0.272				4.97	4.67	10.0	6.0	7.62
25-Aug-21	23-Aug-21	KM	0.10	0.144	0.155	0.20	0.010	0.164				4.46	4.67	10.0	6.0	7.75
25-Aug-21	24-Aug-21	KM	0.11	0.152	0.155	0.20	0.010	0.175	3.06	0.073	0.82	4.13	4.68	10.0	6.0	7.69
26-Aug-21	25-Aug-21	KM	0.07	0.091	0.155	0.20	0.010	0.146				4.05	4.68	10.0	6.0	7.64
30-Aug-21	26-Aug-21	KM	0.08	0.106	0.155	0.20	0.010	0.189				4.09	4.68	10.0	6.0	7.62
30-Aug-21	27-Aug-21	KM	0.08	0.084	0.155	0.20	0.010	0.118				3.79	4.69	10.0	6.0	7.76
30-Aug-21	28-Aug-21	KM	0.07	0.085	0.154	0.20	0.010	0.105				4.44	4.69	10.0	6.0	7.73
30-Aug-21	29-Aug-21	KM	0.09	0.099	0.154	0.20	0.010	0.110				3.64	4.69	10.0	6.0	7.67
31-Aug-21	30-Aug-21	KM	0.06	0.069	0.154	0.20	0.010	0.104	2.38	0.055	1.16	3.70	4.69	10.0	6.0	7.72
02-Sep-21	31-Aug-21	KM	0.08	0.098	0.154	0.20	0.010	0.151				3.64	4.69	10.0	6.0	7.69
02-Sep-21	01-Sep-21	KM	0.10	0.131	0.154	0.20	0.010	0.153				4.43	4.70	10.0	6.0	7.71
07-Sep-21	02-Sep-21	KM	0.12	0.147	0.154	0.20	0.010	0.189				4.66	4.70	10.0	6.0	7.77
07-Sep-21	03-Sep-21	KM	0.08	0.107	0.154	0.20	0.010	0.203				4.71	4.70	10.0	6.0	7.74
07-Sep-21	04-Sep-21	KM	0.10	0.129	0.154	0.20	0.010	0.194				4.61	4.71	10.0	6.0	7.63
07-Sep-21	05-Sep-21	KM	0.10	0.125	0.154	0.20	0.010	0.150				4.77	4.71	10.0	6.0	7.68
07-Sep-21	06-Sep-21	KM	0.11	0.127	0.154	0.20	0.010	0.201	3.04	0.088	1.45	4.78	4.71	10.0	6.0	7.61
10-Sep-21	07-Sep-21	KM	0.10	0.142	0.154	0.20	0.010	0.153				4.19	4.71	10.0	6.0	7.76
10-Sep-21	08-Sep-21	KM	0.09	0.139	0.153	0.20	0.010	0.160				3.91	4.71	10.0	6.0	7.71
10-Sep-21	09-Sep-21	KM	0.10	0.138	0.153	0.20	0.010	0.159				3.95	4.71	10.0	6.0	7.63
13-Sep-21	10-Sep-21	KM	0.09	0.135	0.153	0.20	0.010	0.163				4.33	4.71	10.0	6.0	7.70
13-Sep-21	11-Sep-21	KM	0.10	0.134	0.153	0.20	0.010	0.163				4.89	4.71	10.0	6.0	7.70
13-Sep-21	12-Sep-21	KM	0.11	0.151	0.153	0.20	0.010	0.155	3.12	0.116	1.17	4.56	4.71	10.0	6.0	7.63

DATE ANALYZED	DATE COMPOSITE STARTED	LAB TESTER'S INITIALS	ORTHOPOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	TOTAL PHOSPHORUS (RDOS) ROLLING ANNUAL AVERAGE	TOTAL PHOSPHORUS MAXIMUM ANNUAL AVERAGE (OC)	TOTAL PHOSPHORUS TARGET ANNUAL AVERAGE (OC)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	NITRITE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL NITROGEN (RDOS) ROLLING ANNUAL AVERAGE	TOTAL NITROGEN MAXIMUM (OC)	TOTAL NITROGEN MAXIMUM ANNUAL AVERAGE (OC)	pH Composite (RDOS)
dd-mm-yr	dd-mm-yr		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
16-Sep-21	13-Sep-21	KM	0.09	0.127	0.153	0.20	0.010	0.128				4.47	4.72	10.0	6.0	7.55
16-Sep-21	14-Sep-21	KM	0.11	0.160	0.153	0.20	0.010	0.994				5.40	4.72	10.0	6.0	7.63
16-Sep-21	15-Sep-21	KM	0.07	0.111	0.153	0.20	0.010	0.267				5.68	4.72	10.0	6.0	7.65
20-Sep-21	16-Sep-21	KM	0.05	0.092	0.153	0.20	0.010	0.346				5.21	4.72	10.0	6.0	7.64
20-Sep-21	17-Sep-21	KM	0.06	0.115	0.153	0.20	0.010	0.451				4.48	4.72	10.0	6.0	7.57
20-Sep-21	18-Sep-21	KM	0.07	0.137	0.153	0.20	0.010	0.472				4.84	4.73	10.0	6.0	7.64
20-Sep-21	19-Sep-21	KM	0.07	0.147	0.153	0.20	0.010	0.967				5.47	4.73	10.0	6.0	7.61
21-Sep-21	20-Sep-21	KM	0.07	0.141	0.152	0.20	0.010	0.348	2.41	0.310	1.56	4.63	4.73	10.0	6.0	7.50
24-Sep-21	21-Sep-21	KM	0.09	0.135	0.152	0.20	0.010	0.165				4.03	4.73	10.0	6.0	7.52
24-Sep-21	22-Sep-21	KM	0.11	0.157	0.152	0.20	0.010	0.345				4.15	4.74	10.0	6.0	7.59
24-Sep-21	23-Sep-21	KM	0.11	0.160	0.152	0.20	0.010	0.285				4.40	4.74	10.0	6.0	7.49
27-Sep-21	24-Sep-21	KM	0.12	0.171	0.153	0.20	0.010	0.345				5.11	4.74	10.0	6.0	7.58
27-Sep-21	25-Sep-21	KM	0.15	0.196	0.153	0.20	0.010	0.419				4.21	4.74	10.0	6.0	7.65
27-Sep-21	26-Sep-21	KM	0.12	0.163	0.153	0.20	0.010	1.12				5.28	4.75	10.0	6.0	7.60
28-Sep-21	27-Sep-21	KM	0.11	0.150	0.153	0.20	0.010	0.895	2.33	0.394	0.97	4.59	4.75	10.0	6.0	7.55
01-Oct-21	28-Sep-21	KM	0.14	0.142	0.153	0.20	0.010	0.381				4.03	4.75	10.0	6.0	7.70
01-Oct-21	29-Sep-21	KM	0.09	0.138	0.153	0.20	0.010	0.191				4.27	4.75	10.0	6.0	7.76
01-Oct-21	30-Sep-21	KM	0.09	0.123	0.153	0.20	0.010	0.218				4.71	4.76	10.0	6.0	7.68
04-Oct-21	01-Oct-21	KM	0.10	0.140	0.151	0.20	0.010	0.321				4.87	4.76	10.0	6.0	7.78
04-Oct-21	02-Oct-21	KM	0.11	0.163	0.151	0.20	0.010	0.255				4.92	4.76	10.0	6.0	7.69
04-Oct-21	03-Oct-21	KM	0.12	0.133	0.151	0.20	0.010	0.588	3.16	0.361	1.07	5.18	4.77	10.0	6.0	7.65
07-Oct-21	04-Oct-21	KM	0.11	0.132	0.151	0.20	0.010	0.244				4.73	4.77	10.0	6.0	7.81
07-Oct-21	05-Oct-21	KM	0.13	0.133	0.151	0.20	0.010	0.634				4.51	4.77	10.0	6.0	7.79
07-Oct-21	06-Oct-21	KM	0.10	0.159	0.150	0.20	0.010	0.379				4.68	4.77	10.0	6.0	7.67
08-Oct-21	07-Oct-21	KM	0.10	0.140	0.150	0.20	0.010	0.408	2.82	0.361	1.13	4.72	4.77	10.0	6.0	7.55
12-Oct-21	08-Oct-21	RS	0.07	0.093	0.149	0.20	0.010	0.238				4.78	4.77	10.0	6.0	7.98
12-Oct-21	09-Oct-21	RS	0.07	0.132	0.149	0.20	0.010	0.285				5.04	4.77	10.0	6.0	7.89
12-Oct-21	10-Oct-21	RS	0.11	0.104	0.148	0.20	0.010	1.82				5.78	4.77	10.0	6.0	7.76
12-Oct-21	11-Oct-21	RS	0.05	0.095	0.148	0.20	0.010	1.39				4.52	4.77	10.0	6.0	7.75
18-Oct-21	12-Oct-21	KM	0.05	0.081	0.148	0.20	0.010	0.629				4.96	4.77	10.0	6.0	7.78
18-Oct-21	13-Oct-21	KM	0.10	0.109	0.147	0.20	0.010	0.826				4.81	4.78	10.0	6.0	7.79
18-Oct-21	14-Oct-21	KM	0.10	0.142	0.147	0.20	0.010	0.480				4.30	4.78	10.0	6.0	7.71
18-Oct-21	15-Oct-21	KM	0.13	0.135	0.147	0.20	0.010	1.31				6.29	4.78	10.0	6.0	7.90
18-Oct-21	16-Oct-21	KM	0.08	0.105	0.148	0.20	0.010	0.797				6.45	4.78	10.0	6.0	7.90
18-Oct-21	17-Oct-21	KM	0.07	0.116	0.148	0.20	0.010	0.952				5.74	4.78	10.0	6.0	7.77
19-Oct-21	18-Oct-21	KM	0.08	0.119	0.147	0.20	0.010	0.823	2.26	0.348	1.06	4.49	4.78	10.0	6.0	7.62
22-Oct-21	19-Oct-21	KM	0.09	0.125	0.147	0.20	0.010	0.479				4.25	4.78	10.0	6.0	7.75
22-Oct-21	20-Oct-21	KM	0.09	0.180	0.147	0.20	0.010	0.477				3.31	4.78	10.0	6.0	7.75
22-Oct-21	21-Oct-21	KM	0.10	0.134	0.147	0.20	0.010	0.452				4.08	4.78	10.0	6.0	7.67
25-Oct-21	22-Oct-21	KM	0.08	0.128	0.147	0.20	0.010	0.698				4.59	4.78	10.0	6.0	7.85
25-Oct-21	23-Oct-21	KM	0.07	0.111	0.147	0.20	0.010	0.518				4.33	4.78	10.0	6.0	7.72
25-Oct-21	24-Oct-21	KM	0.09	0.126	0.147	0.20	0.010	1.30	1.84	0.243	1.06	4.44	4.77	10.0	6.0	7.75
28-Oct-21	25-Oct-21	KM	0.08	0.122	0.146	0.20	0.010	0.782				4.30	4.77	10.0	6.0	8.03
28-Oct-21	26-Oct-21	KM	0.09	0.128	0.146	0.20	0.010	0.409				4.11	4.77	10.0	6.0	7.97
28-Oct-21	27-Oct-21	KM	0.08	0.116	0.145	0.20	0.010	0.295				3.18	4.77	10.0	6.0	7.79
01-Nov-21	28-Oct-21	KM	0.09	0.108	0.145	0.20	0.010	1.08				4.49	4.77	10.0	6.0	7.63
01-Nov-21	29-Oct-21	KM	0.14	0.169	0.145	0.20	0.010	0.895				4.38	4.77	10.0	6.0	7.90
01-Nov-21	30-Oct-21	KM	0.08	0.118	0.145	0.20	0.010	1.03				4.79	4.76	10.0	6.0	7.79
01-Nov-21	31-Oct-21	KM	0.12	0.114	0.145	0.20	0.010	1.52	2.06	0.168	1.42	5.17	4.76	10.0	6.0	7.65
04-Nov-21	01-Nov-21	KM	0.08	0.107	0.144	0.20	0.010	1.10				4.90	4.76	10.0	6.0	7.84
04-Nov-21	02-Nov-21	KM	0.09	0.117	0.144	0.20	0.010	1.32				4.58	4.76	10.0	6.0	7.69

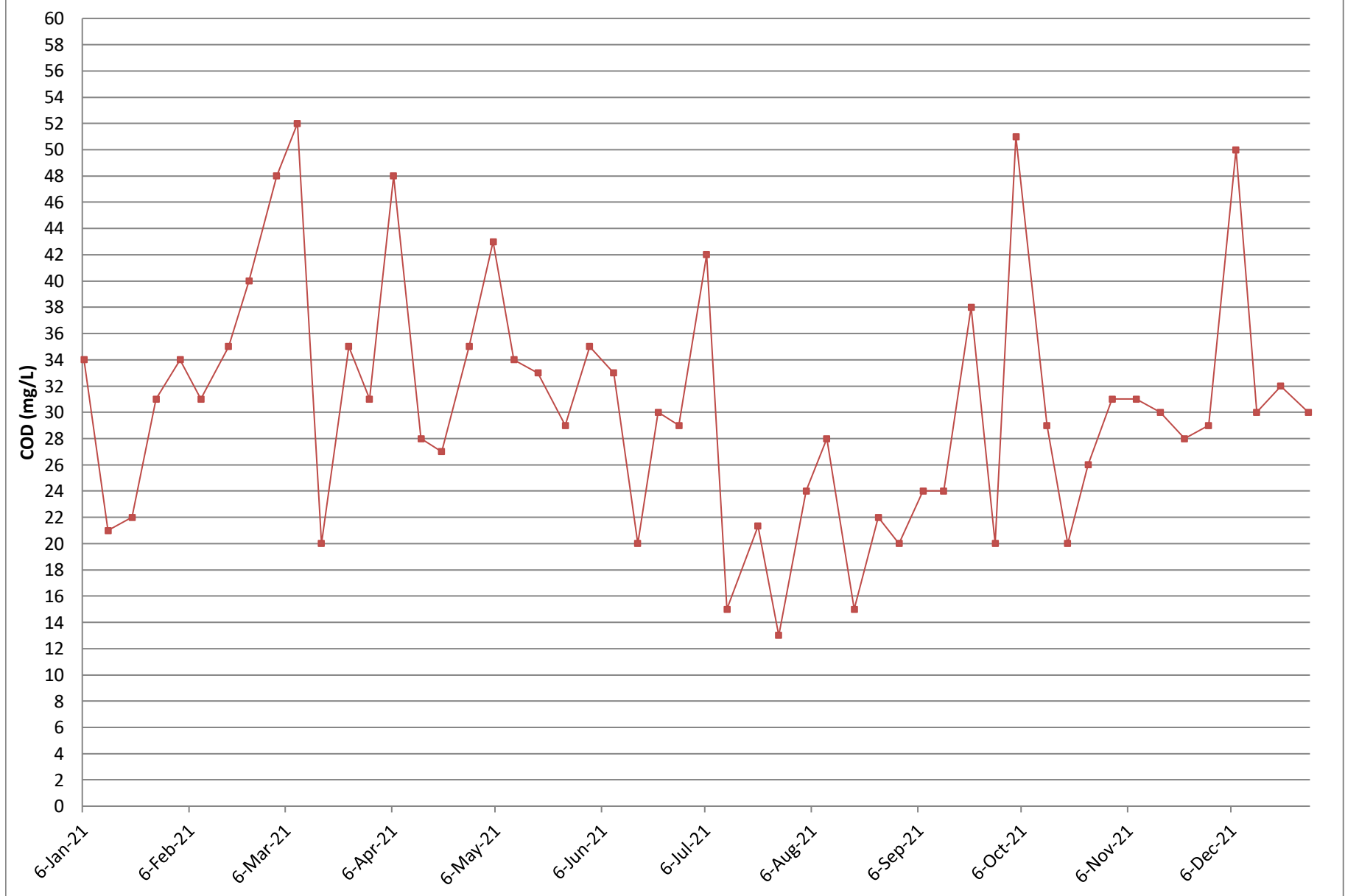
DATE ANALYZED	DATE COMPOSITE STARTED	LAB TESTER'S INITIALS	ORTHOPOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	TOTAL PHOSPHORUS (RDOS) ROLLING ANNUAL AVERAGE	TOTAL PHOSPHORUS MAXIMUM ANNUAL AVERAGE (OC)	TOTAL PHOSPHORUS TARGET ANNUAL AVERAGE (OC)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	NITRITE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL NITROGEN (RDOS) ROLLING ANNUAL AVERAGE	TOTAL NITROGEN MAXIMUM (OC)	TOTAL NITROGEN MAXIMUM ANNUAL AVERAGE (OC)	pH Composite (RDOS)
dd-mm-yr	dd-mm-yr		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
04-Nov-21	03-Nov-21	KM	0.11	0.150	0.144	0.20	0.010	1.65				4.56	4.76	10.0	6.0	7.63
08-Nov-21	04-Nov-21	KM	0.06	0.100	0.144	0.20	0.010	0.745				3.80	4.76	10.0	6.0	7.61
08-Nov-21	05-Nov-21	KM	0.07	0.102	0.143	0.20	0.010	0.755				4.90	4.75	10.0	6.0	7.89
08-Nov-21	06-Nov-21	KM	0.07	0.110	0.143	0.20	0.010	1.39				5.02	4.75	10.0	6.0	7.83
08-Nov-21	07-Nov-21	KM	0.07	0.115	0.142	0.20	0.010	1.85	1.65	0.159	1.47	5.13	4.75	10.0	6.0	7.70
15-Nov-21	08-Nov-21	RS	0.08	0.107	0.142	0.20	0.010	0.192				4.43	4.74	10.0	6.0	7.75
15-Nov-21	09-Nov-21	RS	0.11	0.107	0.142	0.20	0.010	0.639				4.56	4.74	10.0	6.0	7.67
15-Nov-21	10-Nov-21	RS	0.14	0.128	0.142	0.20	0.010	0.768				4.43	4.74	10.0	6.0	7.80
15-Nov-21	11-Nov-21	RS	0.12	0.144	0.142	0.20	0.010	1.47				5.76	4.73	10.0	6.0	7.69
15-Nov-21	12-Nov-21	RS	0.12	0.159	0.142	0.20	0.010	2.07				6.18	4.73	10.0	6.0	7.77
15-Nov-21	13-Nov-21	RS	0.10	0.163	0.142	0.20	0.010	1.89				6.45	4.73	10.0	6.0	7.70
15-Nov-21	14-Nov-21	RS	0.13	0.151	0.142	0.20	0.010	1.43				5.88	4.73	10.0	6.0	7.69
17-Nov-21	15-Nov-21	KM	0.11	0.146	0.142	0.20	0.010	1.28				5.04	4.72	10.0	6.0	7.84
17-Nov-21	16-Nov-21	KM	0.13	0.148	0.142	0.20	0.010	0.752	2.74	0.153	1.36	5.00	4.72	10.0	6.0	7.71
19-Nov-21	17-Nov-21	KM	0.09	0.136	0.141	0.20	0.010	0.52				5.06	4.72	10.0	6.0	7.72
19-Nov-21	18-Nov-21	KM	0.09	0.141	0.142	0.20	0.010	0.46				4.94	4.71	10.0	6.0	7.65
22-Nov-21	19-Nov-21	KM	0.10	0.136	0.142	0.20	0.010	0.55				5.50	4.71	10.0	6.0	7.87
22-Nov-21	20-Nov-21	KM	0.10	0.138	0.141	0.20	0.010	1.10				5.62	4.71	10.0	6.0	7.80
22-Nov-21	21-Nov-21	KM	0.11	0.147	0.141	0.20	0.010	1.82	2.28	0.194	1.30	5.59	4.70	10.0	6.0	7.72
24-Nov-21	22-Nov-21	KM	0.11	0.160	0.142	0.20	0.010	1.25				4.95	4.70	10.0	6.0	7.71
24-Nov-21	23-Nov-21	KM	0.19	0.259	0.142	0.20	0.010	1.09				4.87	4.69	10.0	6.0	7.62
26-Nov-21	24-Nov-21	KM	0.10	0.168	0.142	0.20	0.010	1.20				5.27	4.69	10.0	6.0	7.72
26-Nov-21	25-Nov-21	KM	0.09	0.153	0.142	0.20	0.010	1.08				4.64	4.69	10.0	6.0	7.61
29-Nov-21	26-Nov-21	KM	0.08	0.151	0.142	0.20	0.010	0.64				4.63	4.69	10.0	6.0	7.88
29-Nov-21	27-Nov-21	KM	0.09	0.139	0.142	0.20	0.010	1.14				5.15	4.69	10.0	6.0	7.85
29-Nov-21	28-Nov-21	KM	0.08	0.133	0.142	0.20	0.010	2.32	2.77	0.163	4.00	9.25	4.68	10.0	6.0	7.76
01-Dec-21	29-Nov-21	KM	0.10	0.174	0.142	0.20	0.010	2.22				5.60	4.68	10.0	6.0	7.81
01-Dec-21	30-Nov-21	KM	0.30	0.395	0.143	0.20	0.010	1.77				4.87	4.67	10.0	6.0	7.75
03-Dec-21	01-Dec-21	KM	0.11	0.156	0.143	0.20	0.010	0.765				4.49	4.67	10.0	6.0	7.81
03-Dec-21	02-Dec-21	KM	0.10	0.137	0.143	0.20	0.010	0.737				5.74	4.67	10.0	6.0	7.72
07-Dec-21	03-Dec-21	KM	0.09	0.149	0.143	0.20	0.010	0.792				5.25	4.67	10.0	6.0	7.82
07-Dec-21	04-Dec-21	KM	0.10	0.173	0.143	0.20	0.010	1.33				5.31	4.67	10.0	6.0	7.80
07-Dec-21	05-Dec-21	KM	0.12	0.179	0.143	0.20	0.010	1.89	1.93	0.144	1.18	5.14	4.67	10.0	6.0	7.68
08-Dec-21	06-Dec-21	KM	0.12	0.173	0.144	0.20	0.010	2.17				5.04	4.66	10.0	6.0	7.80
08-Dec-21	07-Dec-21	KM	0.16	0.199	0.144	0.20	0.010	1.45				4.63	4.66	10.0	6.0	7.73
08-Dec-21	08-Dec-21	KM	0.13	0.180	0.144	0.20	0.010	1.01				4.64	4.66	10.0	6.0	7.70
13-Dec-21	09-Dec-21	KM	0.11	0.160	0.144	0.20	0.010	1.20				5.08	4.66	10.0	6.0	7.74
13-Dec-21	10-Dec-21	KM	0.09	0.136	0.144	0.20	0.010	1.44				5.32	4.66	10.0	6.0	7.69
13-Dec-21	11-Dec-21	KM	0.14	0.167	0.144	0.20	0.010	1.93				5.89	4.66	10.0	6.0	7.75
13-Dec-21	12-Dec-21	KM	0.14	0.164	0.144	0.20	0.010	2.14	1.91	0.121	1.26	5.43	4.66	10.0	6.0	7.68
15-Dec-21	13-Dec-21	KM	0.15	0.181	0.145	0.20	0.010	2.24				5.61	4.66	10.0	6.0	7.90
15-Dec-21	14-Dec-21	KM	0.40	0.505	0.146	0.20	0.010	2.38				5.40	4.66	10.0	6.0	7.79
17-Dec-21	15-Dec-21	KM	0.10	0.180	0.146	0.20	0.010	1.53				4.75	4.66	10.0	6.0	7.73
17-Dec-21	16-Dec-21	KM	0.13	0.198	0.146	0.20	0.010	1.29				4.49	4.66	10.0	6.0	7.67
20-Dec-21	17-Dec-21	KM	0.10	0.138	0.146	0.20	0.010	1.41				5.17	4.66	10.0	6.0	7.83
20-Dec-21	18-Dec-21	KM	0.10	0.154	0.146	0.20	0.010	2.17				4.97	4.66	10.0	6.0	7.73
20-Dec-21	19-Dec-21	KM	0.09	0.150	0.146	0.20	0.010	2.30	1.79	0.112	0.99	5.19	4.67	10.0	6.0	7.66
23-Dec-21	20-Dec-21	KM	0.11	0.163	0.146	0.20	0.010	2.05				5.23	4.67	10.0	6.0	7.90
23-Dec-21	21-Dec-21	KM	0.12	0.151	0.146	0.20	0.010	2.25				4.74	4.67	10.0	6.0	7.77
23-Dec-21	22-Dec-21	KM	0.09	0.155	0.146	0.20	0.010	2.51				5.04	4.67	10.0	6.0	7.72
28-Dec-21	23-Dec-21	KM	0.10	0.174	0.146	0.20	0.010	2.75				5.15	4.67	10.0	6.0	7.91

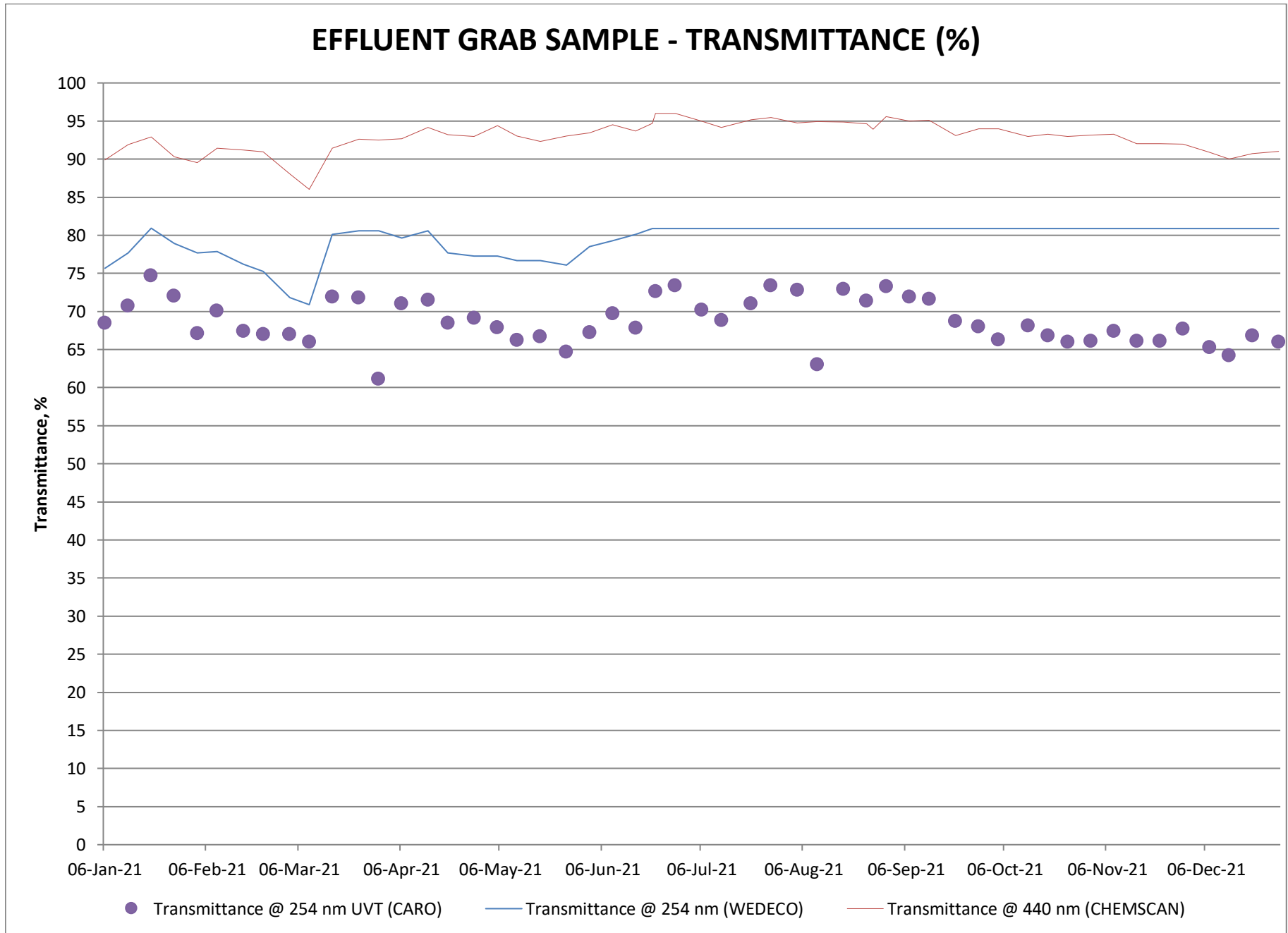
DATE ANALYZED	DATE COMPOSITE STARTED	LAB TESTER'S INITIALS	ORTHOPOSPHATE as P (RDOS)	TOTAL PHOSPHORUS (RDOS)	TOTAL PHOSPHORUS (RDOS) ROLLING ANNUAL AVERAGE	TOTAL PHOSPHORUS MAXIMUM ANNUAL AVERAGE (OC)	TOTAL PHOSPHORUS TARGET ANNUAL AVERAGE (OC)	AMMONIA as N (RDOS)	NITRATE as N (RDOS)	NITRITE as N (RDOS)	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL NITROGEN (RDOS) ROLLING ANNUAL AVERAGE	TOTAL NITROGEN MAXIMUM MAXIMUM (OC)	TOTAL NITROGEN MAXIMUM ANNUAL AVERAGE (OC)	pH Composite (RDOS)
dd-mm-yr	dd-mm-yr		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
28-Dec-21	24-Dec-21	KM	0.10	0.163	0.147	0.20	0.010	3.08				5.39	4.67	10.0	6.0	7.83
28-Dec-21	25-Dec-21	KM	0.09	0.154	0.147	0.20	0.010	3.27				6.10	4.67	10.0	6.0	7.88
28-Dec-21	26-Dec-21	KM	0.08	0.161	0.147	0.20	0.010	4.06				7.16	4.68	10.0	6.0	7.77
28-Dec-21	27-Dec-21	KM	0.07	0.151	0.147	0.20	0.010	5.04	1.78	0.114	0.80	7.73	4.67	10.0	6.0	7.70
30-Dec-21	28-Dec-21	KM	0.10	0.140	0.147	0.20	0.010	5.54				7.86	4.67	10.0	6.0	7.80
30-Dec-21	29-Dec-21	KM	0.13	0.184	0.147	0.20	0.010	7.16				9.14	4.67	10.0	6.0	7.67
03-Jan-22	30-Dec-21	KM	0.07	0.151	0.147	0.20	0.010	7.51				9.67	4.67	10.0	6.0	7.62
03-Jan-22	31-Dec-21	KM	0.05	0.151	0.147	0.20	0.010	6.07				8.35	4.67	10.0	6.0	7.64
Average			0.08	0.147				0.81	2.51	0.14	1.25	4.67				7.70
n			365	365				365	57	56	60	360				365
Std. Dev.			0.03	0.09				1.01	1.00	0.09	0.54	1.38				0.12
Min			0.03	0.069				0.09	0.51	0.02	0.27	1.76				7.32
Max			0.40	1.30				7.51	4.34	0.39	4.00	10.4				8.12

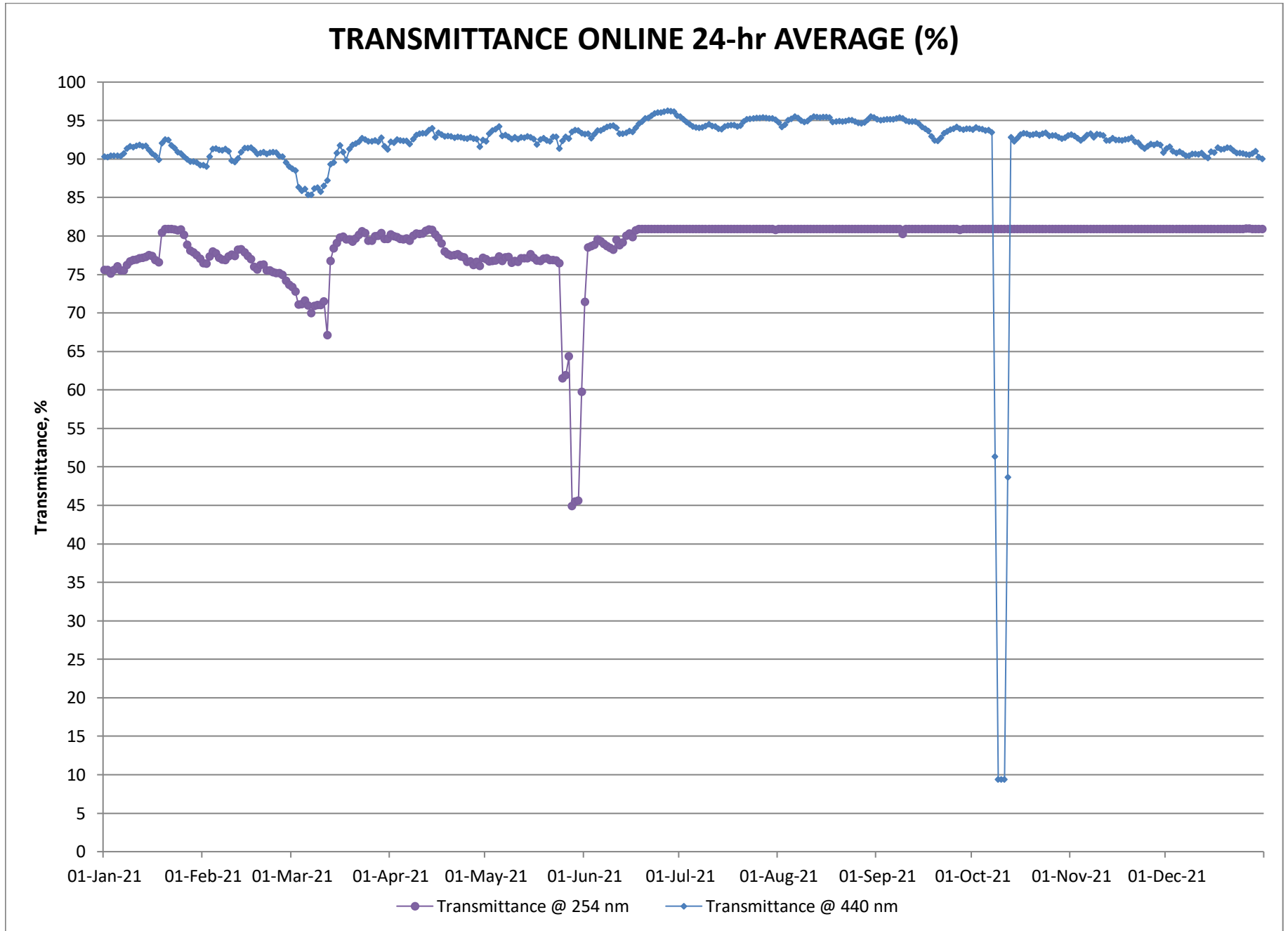
Total Loadings From WWTP, kg/yr	18.209	31.437				173.81	537.66	29.365	269	1000.7
Loadings From WWTP To River, kg/y	11.36	19.613				108.43	335.43	18.32	167.82	624.34



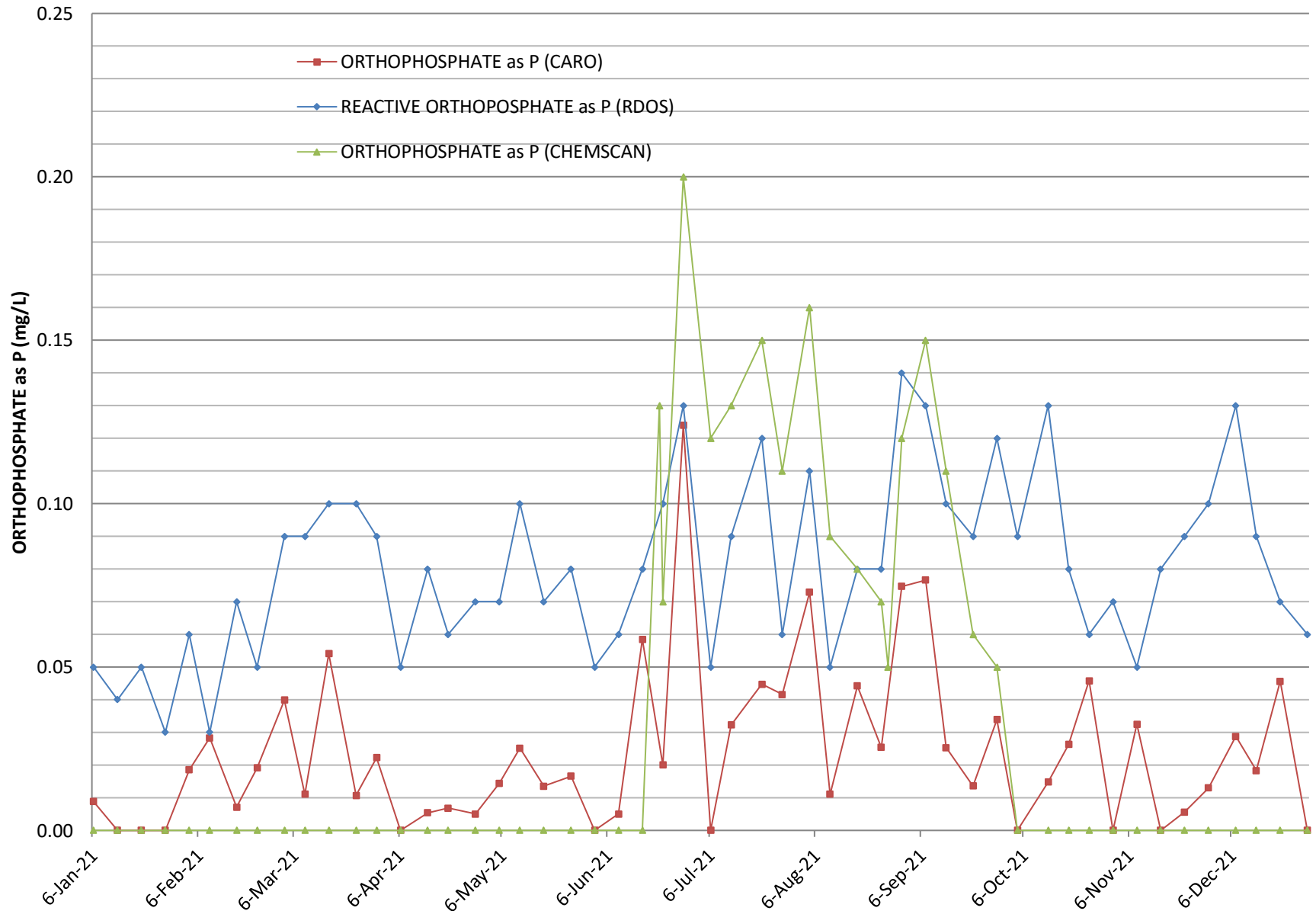
WEEKLY GRAB SAMPLE - CHEMICAL OXYGEN DEMAND (COD)



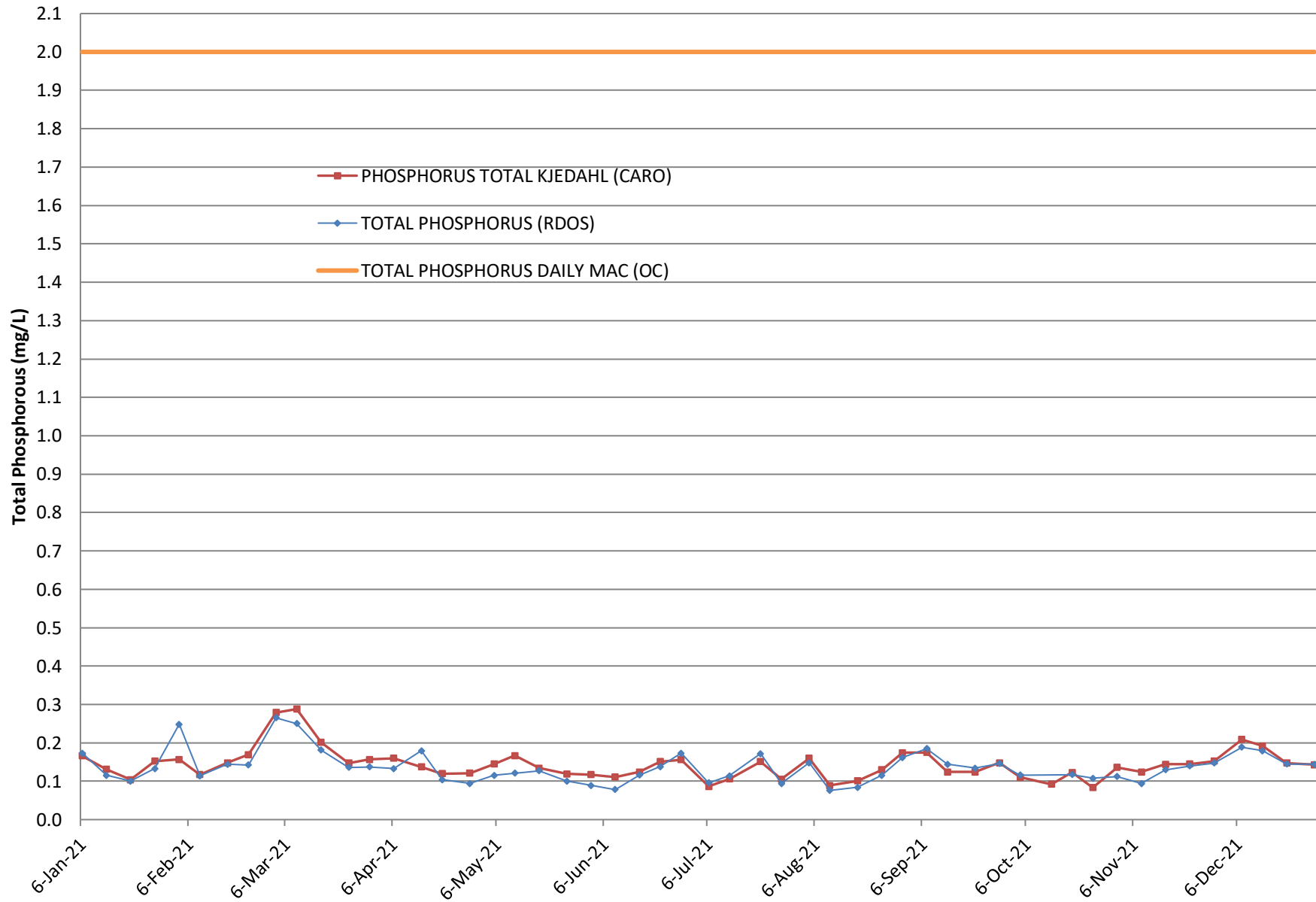


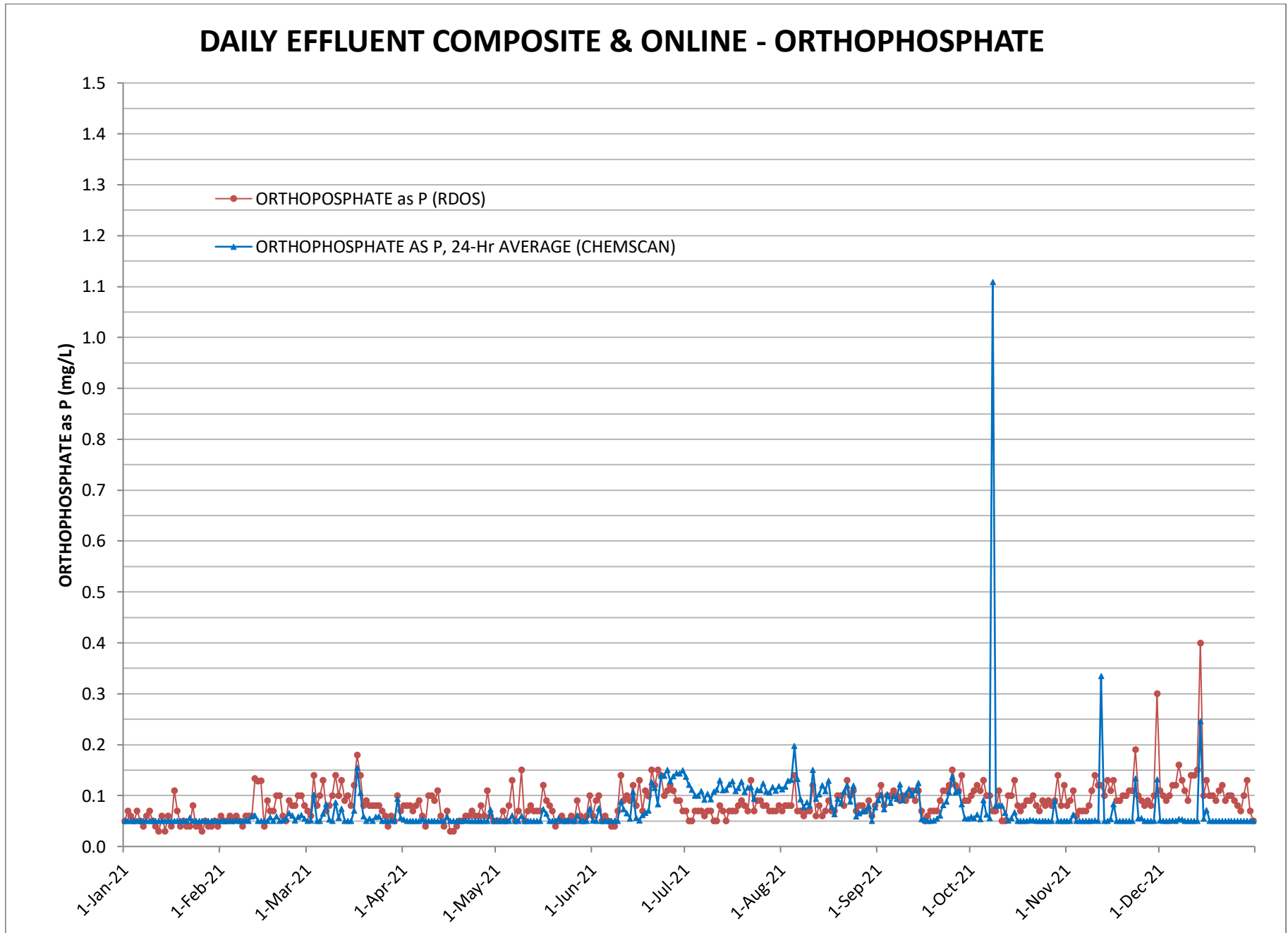


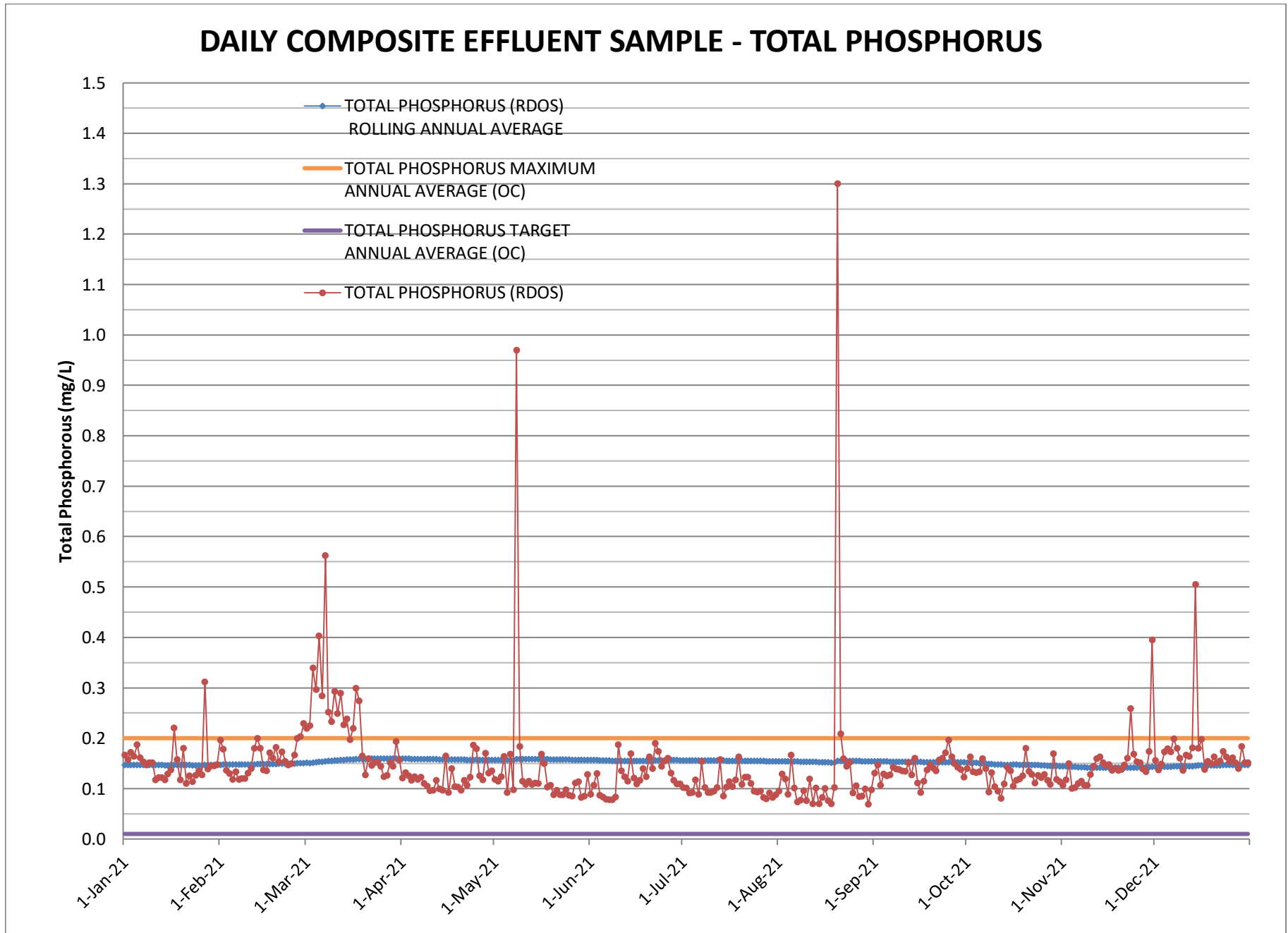
EFFLUENT GRAB SAMPLE - ORTHOPHOSPHATE (PO₄³⁻) as P



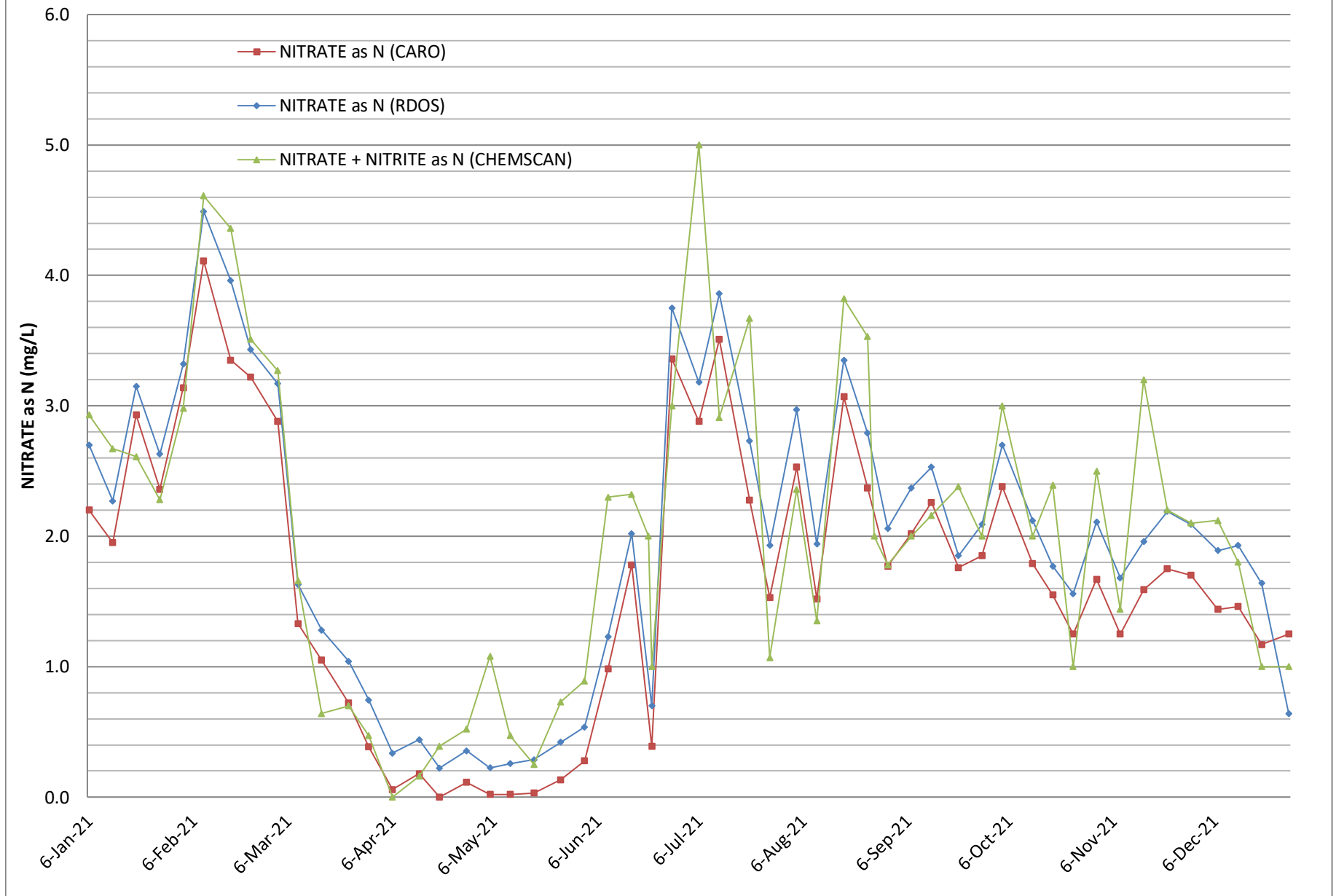
WEEKLY EFFLUENT GRAB SAMPLE - TOTAL PHOSPHOROUS

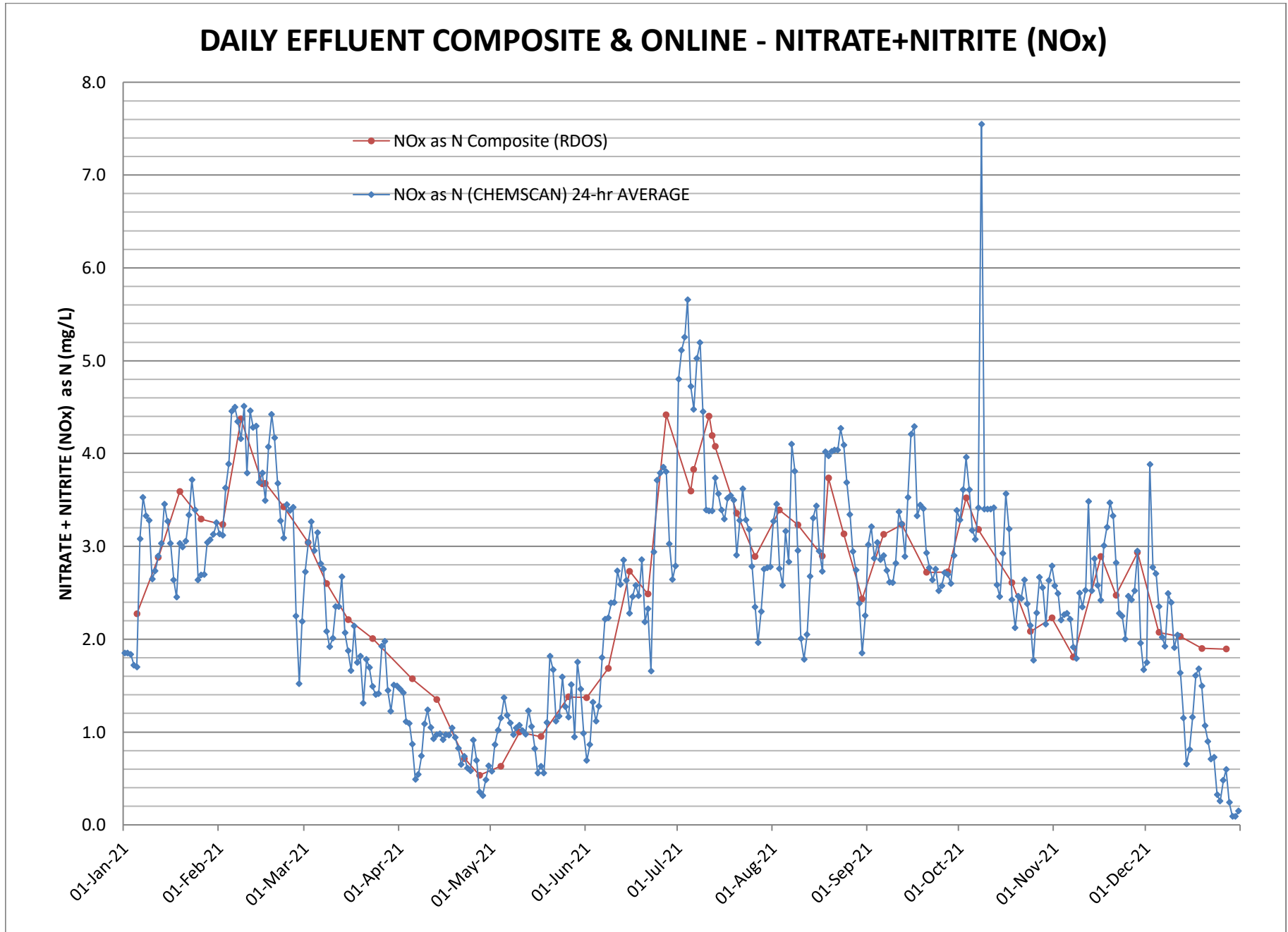




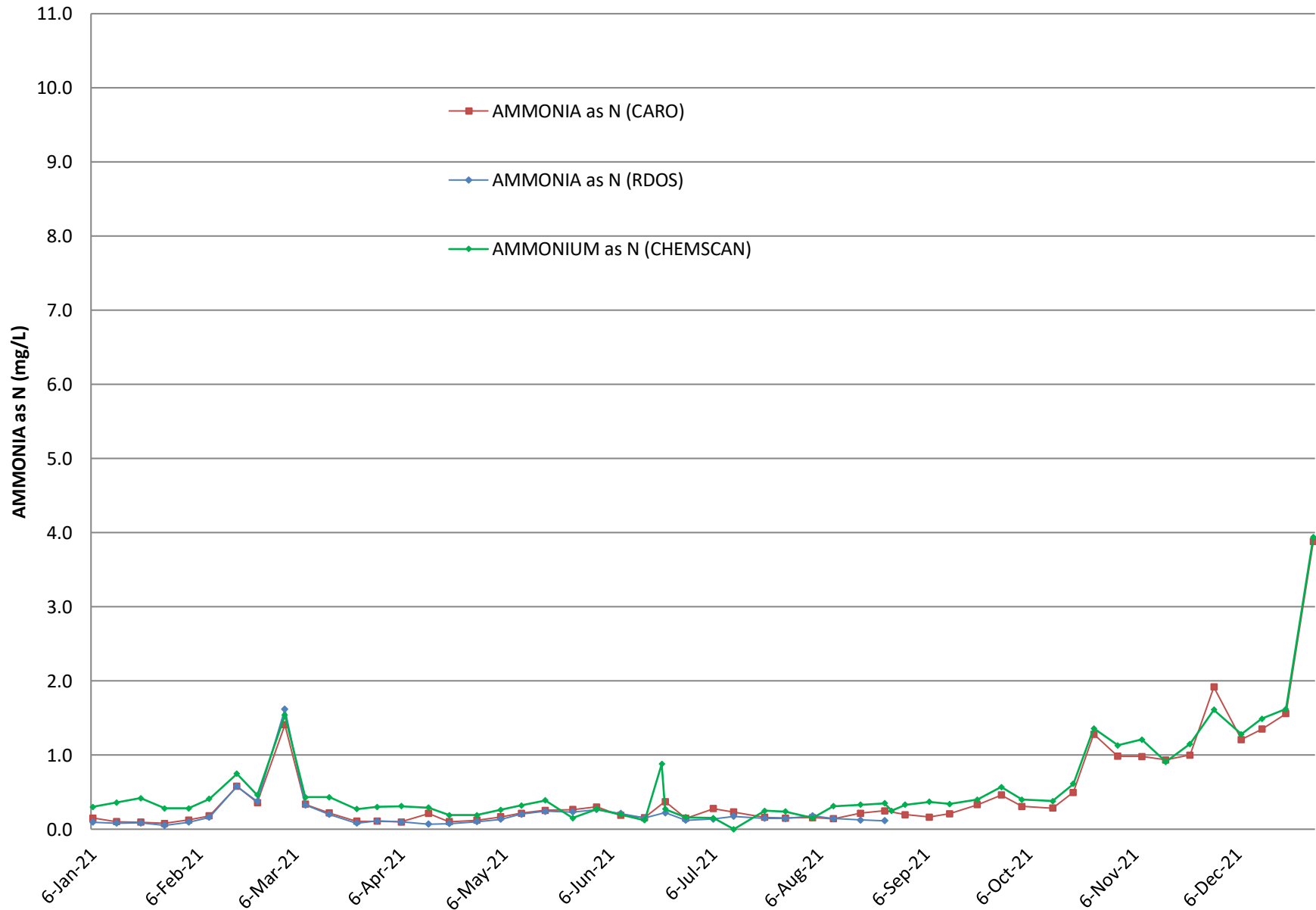


EFFLUENT GRAB SAMPLE - NITRATE (NO₃⁻) as N

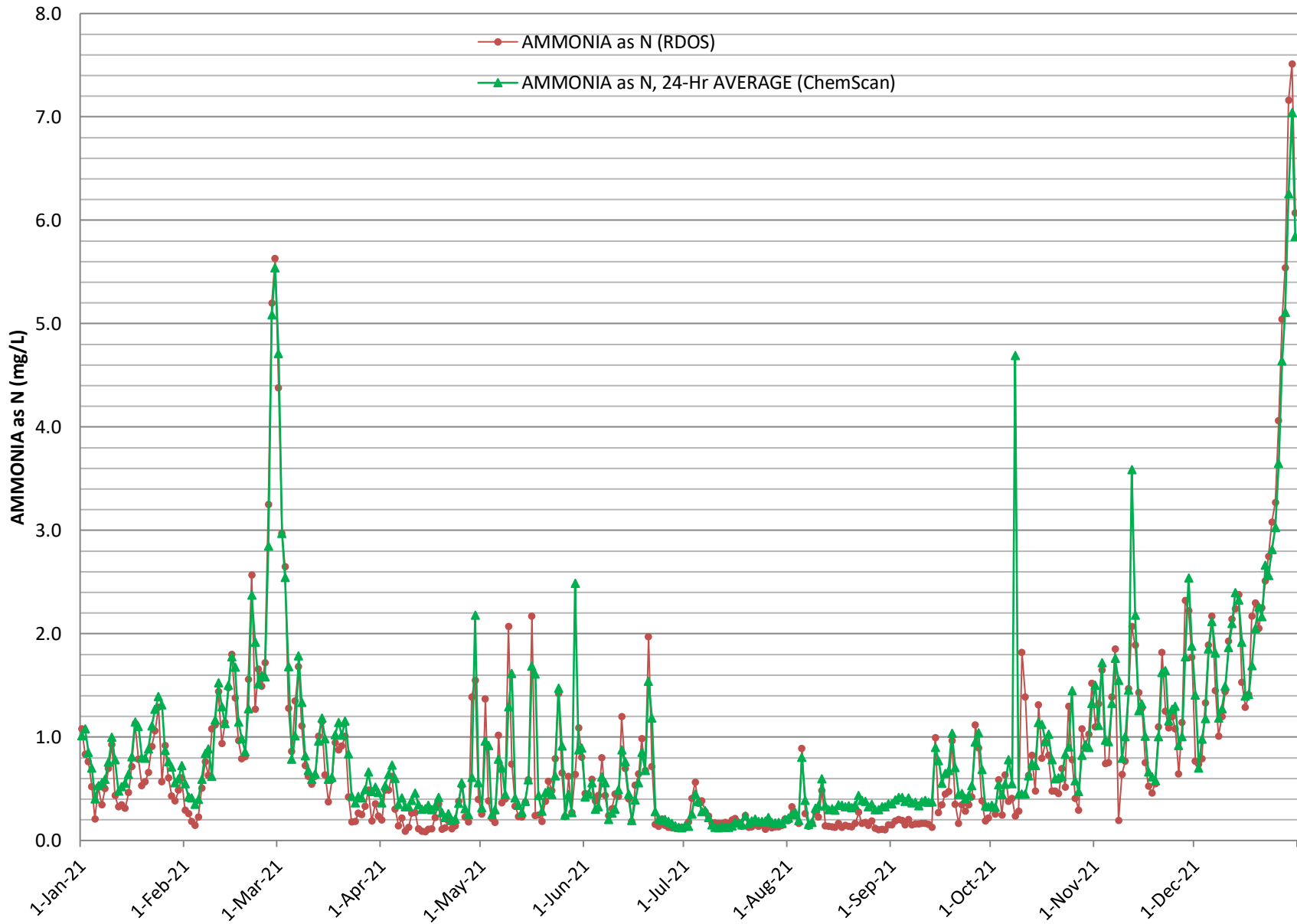




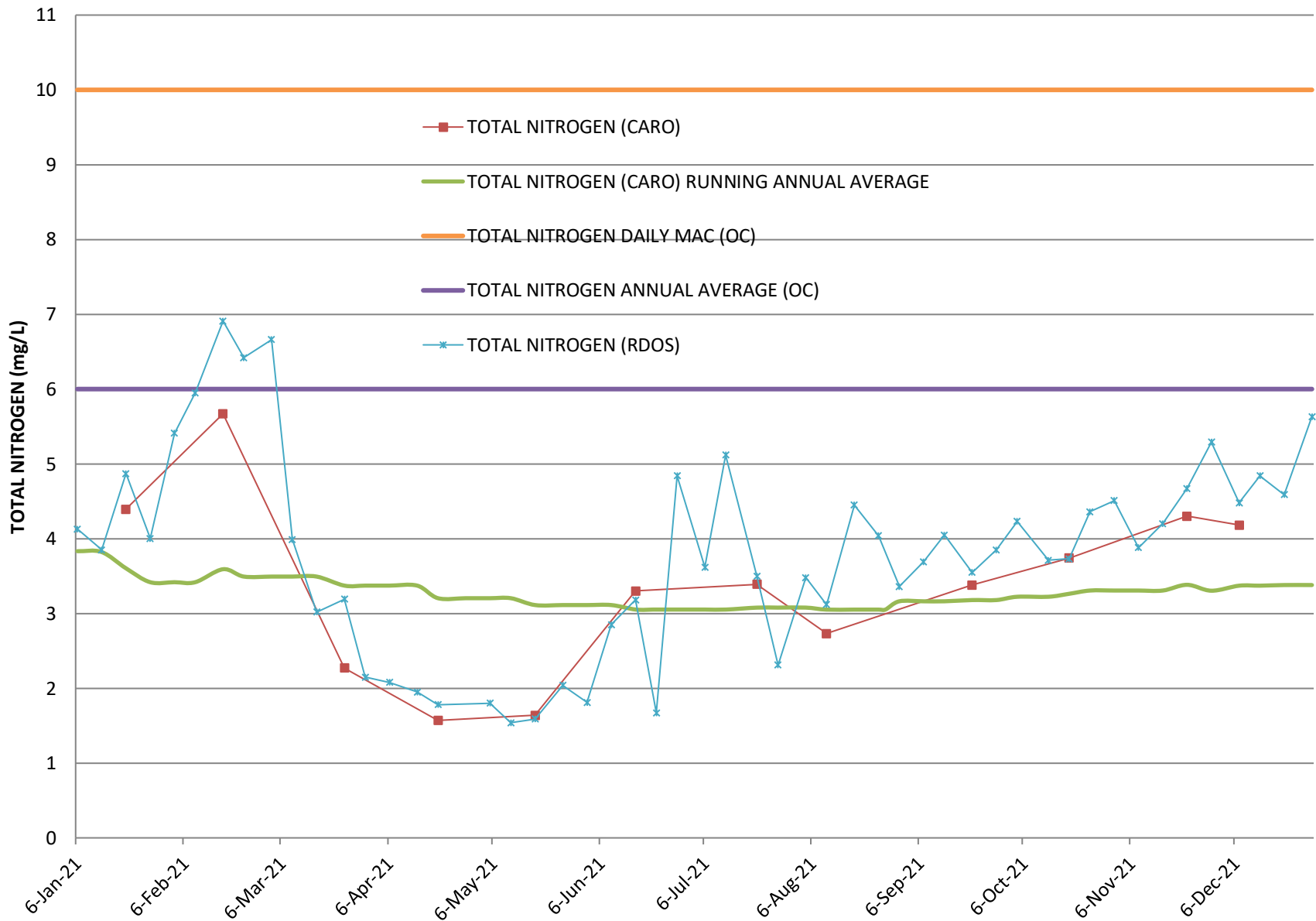
EFFLUENT GRAB SAMPLE - AMMONIA (NH₃) as N



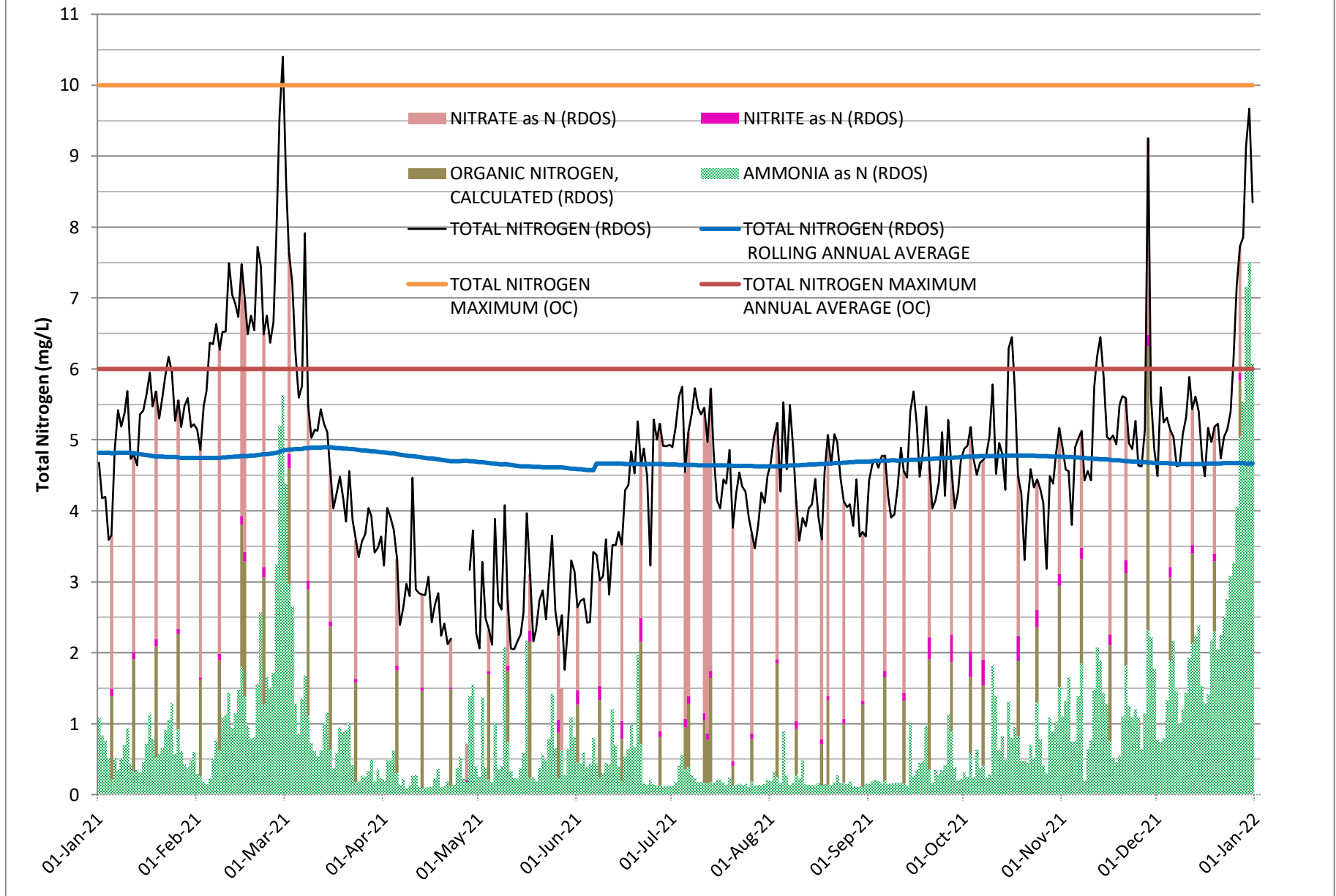
DAILY EFFLUENT COMPOSITE & ONLINE - AMMONIA as N

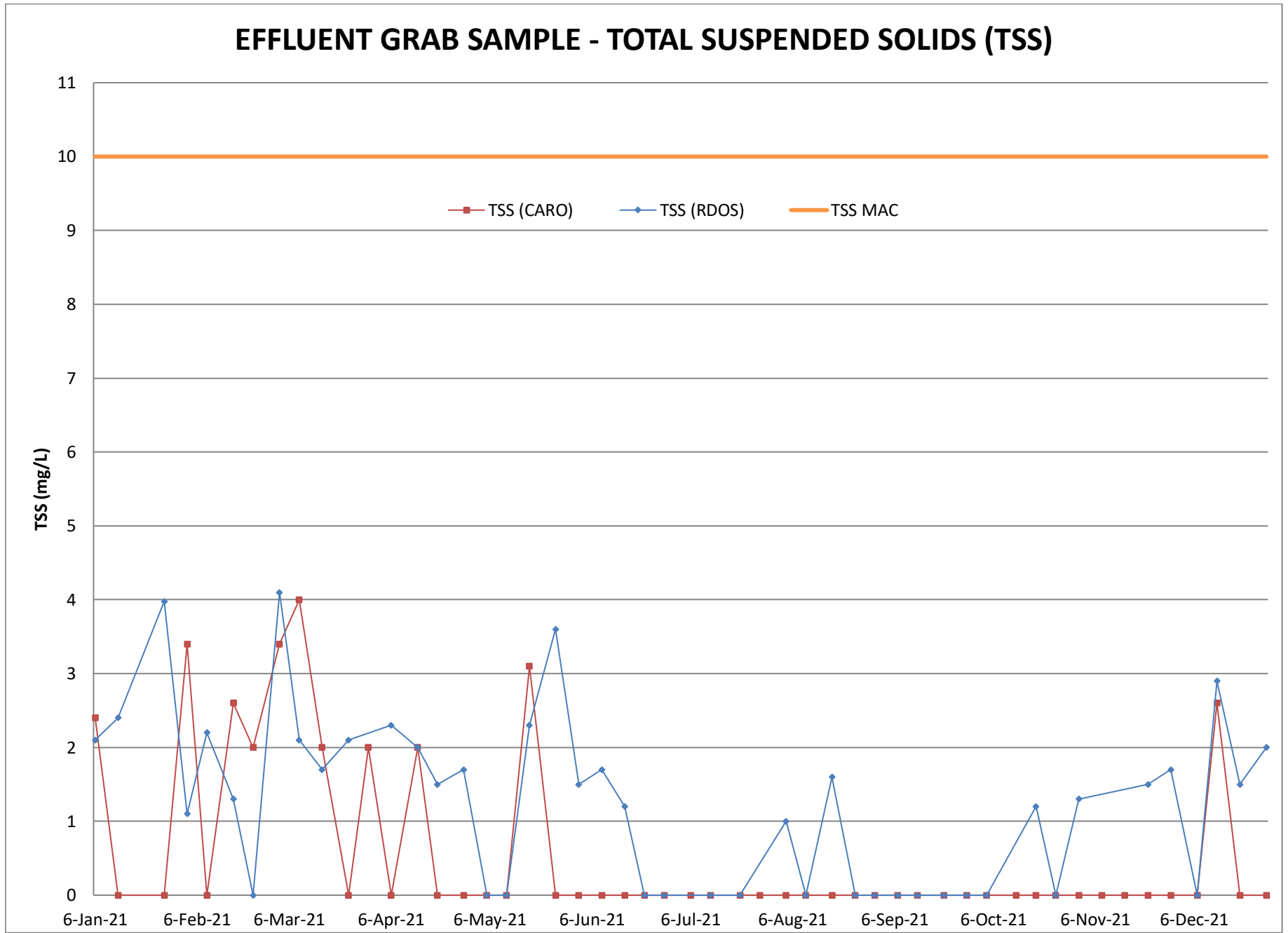


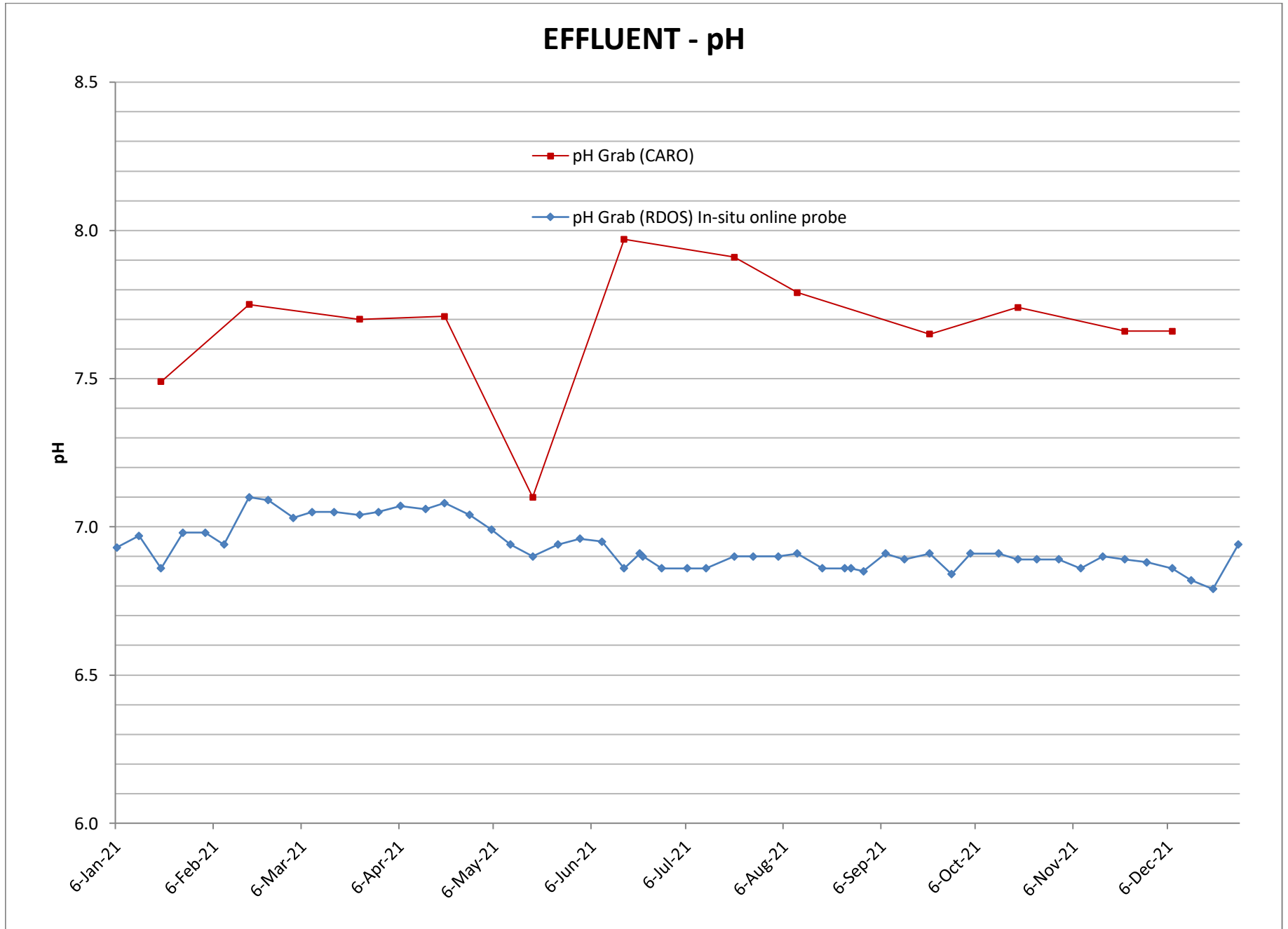
EFFLUENT GRAB SAMPLE - TOTAL NITROGEN

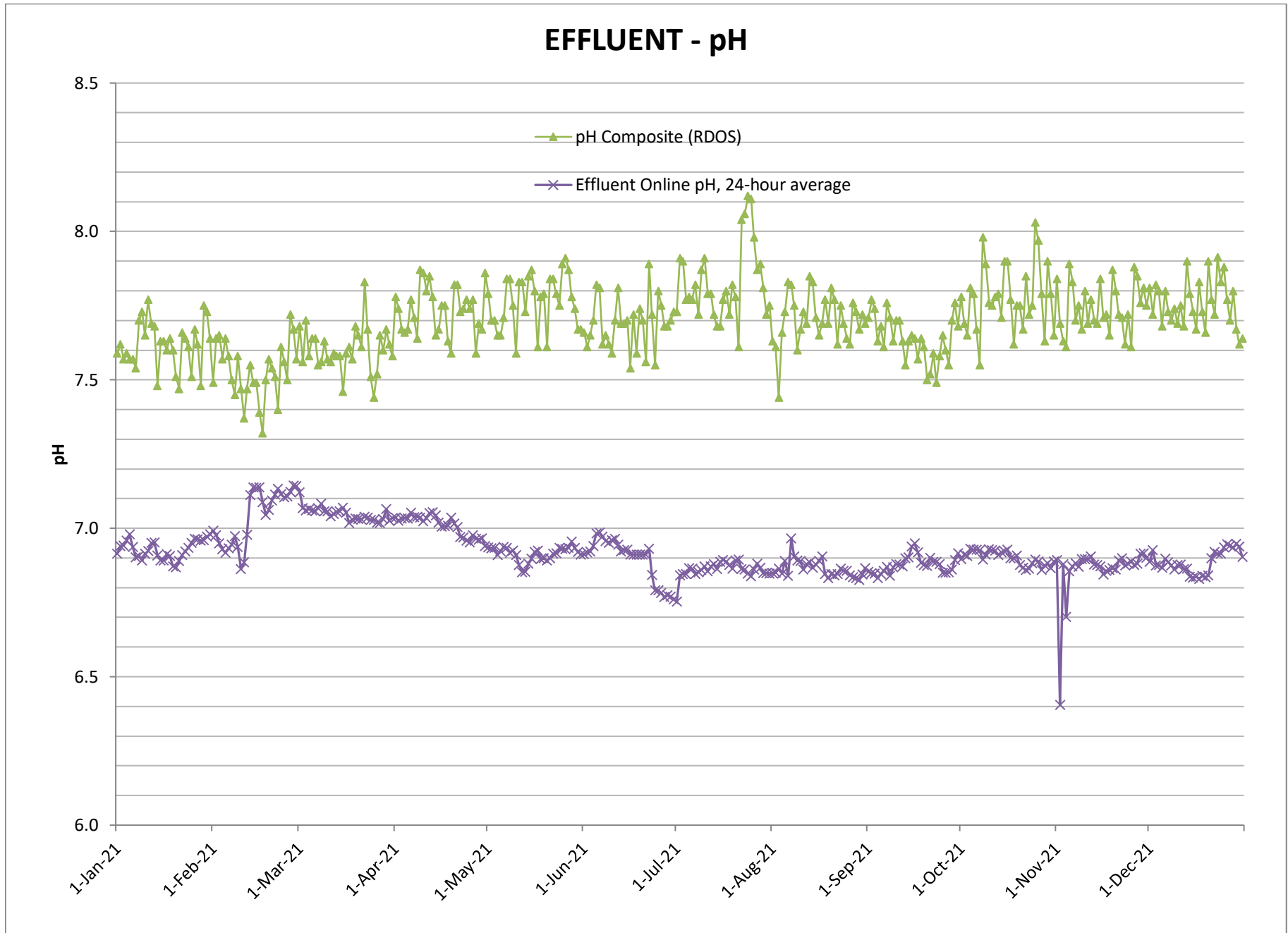


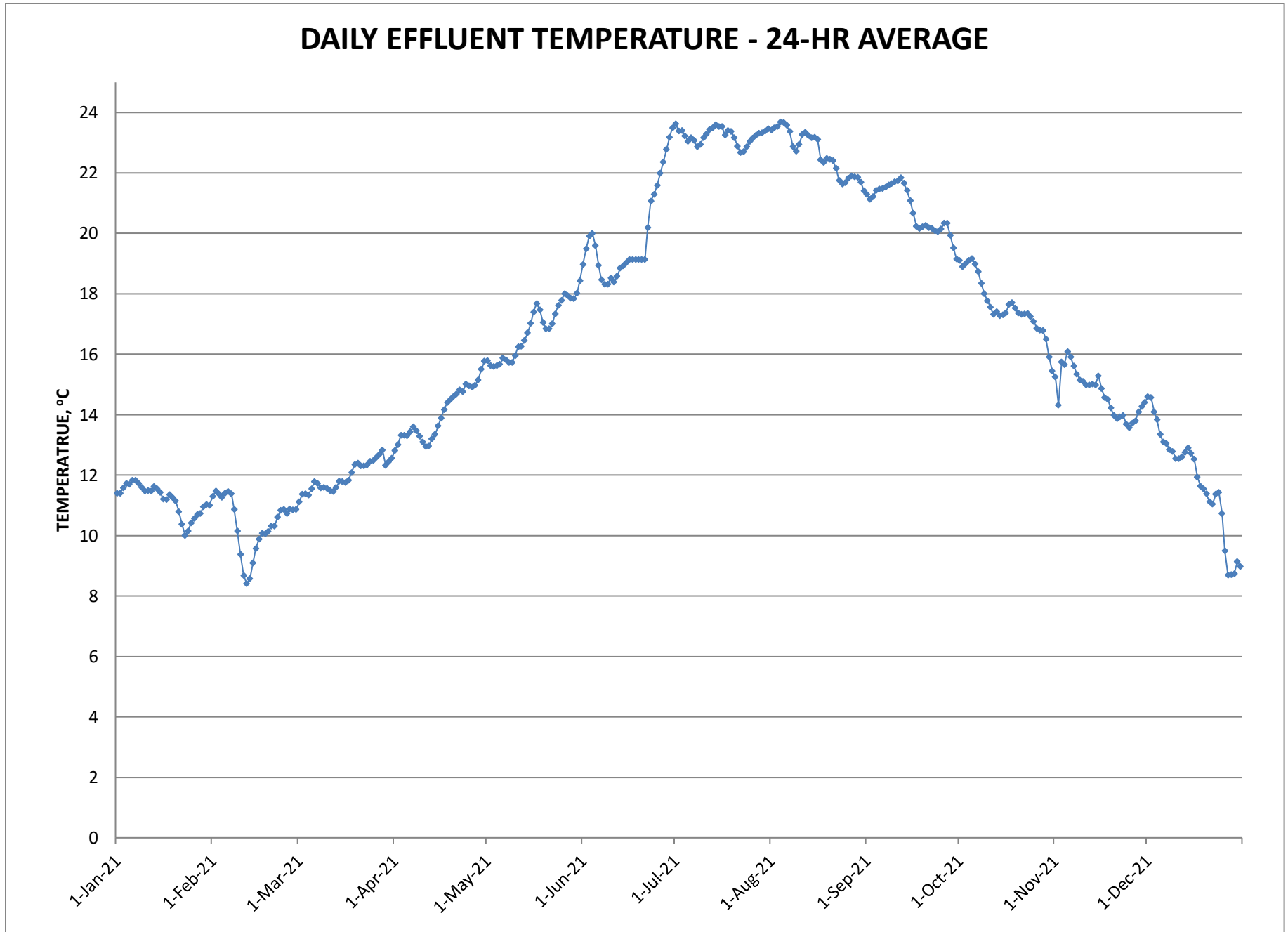
DAILY COMPOSITE EFFLUENT SAMPLE - TOTAL NITROGEN

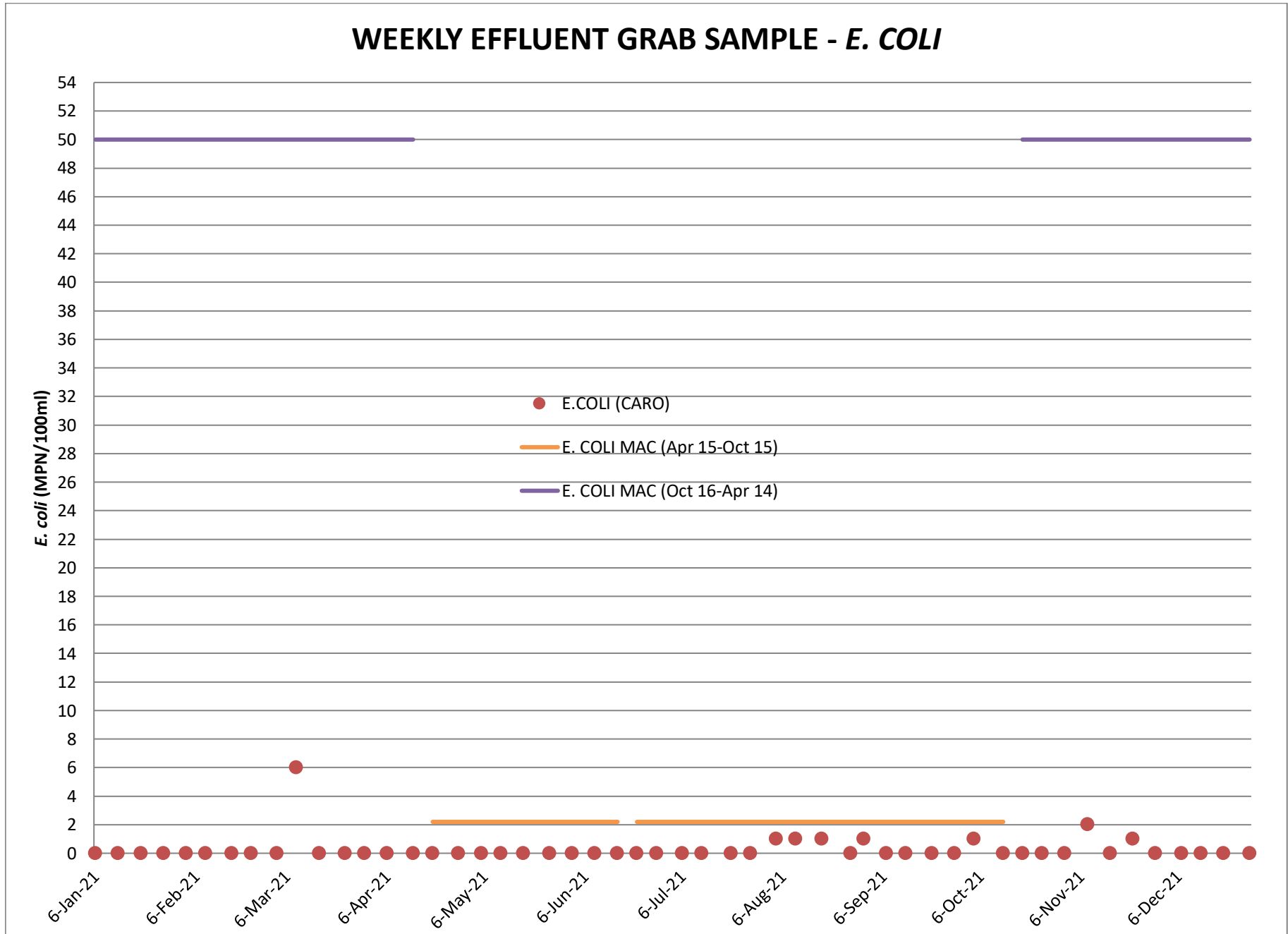












APPENDIX M

Wetland Water Quality Monitoring Database Summary 2021

Okanagan Falls Advanced Wastewater Treatment Facility

DATE	TIME (24HR)	*WEEKLY (W), BI-WEEKLY (BW), MONTHLY (M) OR YEARLY (Y)	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	FIELD DATA							RDOS AND CARO DATA									
					TEMPERATURE field data (RDOS)	DISSOLVED OXYGEN	SPECIFIC CONDUCTANCE	TOTAL DISSOLVED SOLIDS	pH field data (RDOS)	OXIDATION REDUCTION POTENTIAL	TURBIDITY	CBOD (CARO)	TOTAL PHOSPHORUS (RDOS)	PHOSPHORUS TOTAL KIEDAHL (CARO)	NITRATE as N (RDOS)	NITRATE as N (CARO)	NITRITE as N (RDOS)	NITRITE as N (CARO)	AMMONIA as N (RDOS)	AMMONIA as N (CARO)	
mm/did/yr	HR:MIN	BW/M			°C	mg/L	u S/cm	g/L		mV	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2-Mar-21	11:15	M	KM	KM	2.9				7.19			<6.0	0.015	0.0443	0.144	<0.010	<0.015	<0.010	<0.015	<0.050	
20-May-21	11:35	M	KM	KM	14.1				7.82			<4.9	0.021	0.0501	0.395	<0.010	<0.015	<0.010	0.011	<0.050	
26-May-21	10:55	W	KM	KM	16.4				7.65				0.050	0.0509	0.347		<0.015		0.018		
2-Jun-21	12:10	W	KM	KM	20.8				7.38				0.021	0.0428	0.336		<0.015		0.038		
9-Jun-21	11:10	BW	KM	KM	15.6				7.37				0.020	0.0356	0.323		<0.015		0.024		
16-Jun-21	13:15	M	KM	KM	17.2	0.85	956	0.624	7.30	67.2	0.48	<6.3	0.037	0.0289	0.373	0.046	<0.015	<0.010	0.04	0.099	
23-Jun-21	13:10	W	KM	KM	21.9	2.79	963	0.624	7.39	66.0			0.022	0.0348	0.317		<0.015		0.049		
28-Jun-21	11:08	BW	RS	KM	23.5	0.35	961	0.624	7.28	61.2			0.049	0.0449	0.355		<0.015		0.056		
8-Jul-21	10:50	W	KM	KM	20.7	0.12	976	0.6305	7.27	12.1			0.077	0.0687	0.298		<0.015		0.061		
12-Jul-21	12:05	BW	KM	KM	22.3				7.36				0.059	0.0616	0.273		<0.015		0.124		
21-Jul-21	13:25	M	KM	KM	20.6	0.22	988	0.6435	7.29	-22.7		<5.3	0.047	0.0504	0.299	<0.010	<0.015	<0.010	0.071	0.080	
27-Jul-21	13:25	W	RS/CH	RS/CH	20.7				7.33				0.026	0.0403	0.243		<0.015		0.062		
4-Aug-21	11:30	BW	KM	KM	21.4				7.35				0.028	0.0469	0.268		<0.015		0.052		
10-Aug-21	10:50	M	KM	KM	19.2	0.38	973	0.6305	7.27	2.3		<5.3	0.016	0.0384	0.345	<0.010	<0.015	<0.010	0.031	<0.050	
18-Aug-21	13:05	W	KM	KM	18.4	2.78	921	0.598	7.30	55.5			0.022	0.0269	0.274		<0.015		0.009		
25-Aug-21	12:01	BW	KM	KM	15.4	2.21			7.40				0.020	0.0230	0.248		<0.015		0.007		
27-Aug-21	12:40	Coliforms	KM	KM																	
31-Aug-21	11:05	BW	KM	KM	16.0	1.75			7.49				0.020	0.0366	0.379		<0.015		0.106		
7-Sep-21	15:30	BW	KM	KM	16.0	2.00	930	0.6045	6.99	76.3			0.011	0.0298	0.263		<0.015		0.021		
13-Sep-21	11:20	BW	KM	KM	15.9	0.99	952	0.6145	7.16	64.6				0.0371							

DATE	TIME (24HR)	*WEEKLY (W), BI-WEEKLY (BW), MONTHLY (M) OR YEARLY (Y)	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	FIELD DATA							RDOS AND CARO DATA															
					TEMPERATURE field data (RDOS)	DISSOLVED OXYGEN	SPECIFIC CONDUCTANCE	TOTAL DISSOLVED SOLIDS	pH field data (RDOS)	OXIDATION REDUCTION POTENTIAL	TURBIDITY	cBOD (CARO)	TOTAL PHOSPHORUS (RDOS)	PHOSPHORUS TOTAL KJEDAHN (CARO)	NITRATE as N (RDOS)	NITRATE as N (CARO)	NITRITE as N (RDOS)	NITRITE as N (CARO)	AMMONIA as N (RDOS)	AMMONIA as N (CARO)							
mm/did/yr	HR:MIN	BW/M			°C	mg/L	µS/cm	g/L		mV	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L							
21-Sep-21	11:55	M	KM	KM	13.5	2.99	974	0.6305	7.17	83.3		<7.4	0.021	0.0319	0.163	0.029	<0.015	<0.010	0.013	0.050							
28-Sep-21	10:50	BW	KM	KM	13.1	1.48	988	0.6435	6.97	74.8			0.024	0.0343	0.462		<0.015		0.023								
4-Oct-21	11:10	BW	KM	KM	10.5	1.41	1014	0.6565	7.05	75.8			0.023	0.0316	0.467		<0.015		0.014								
13-Oct-21	12:45	BW	RS	RS/KM	9.3				7.29				0.014	0.0245	1.10		<0.015		0.024								
19-Oct-21	11:20	M	KM	KM	8.2				7.54			<1	0.016	0.0260	0.492	0.212	<0.015	<0.010	<0.003	<0.050							
25-Oct-21	11:40	BW	KM	KM	9.1	1.16	1017	0.663	7.30	82.8			0.016	0.0351	0.219		<0.015		0.014								
1-Nov-21	12:10	BW	KM	KM	5.4	1.93	1049	0.6825	7.10	77.1			0.021	0.0282	0.348		<0.015		0.019								
8-Nov-21	11:45	BW	KM	KM	5.7	5.33	1092	0.7086	7.10	84.1	0.54		0.017	0.0310	0.406		<0.015		0.016								
17-Nov-21	11:30	M	KM	KM	5.1	3.90	1114	0.7215	7.42	85.8		7.1	0.006	0.0241	0.454	0.171	<0.015	<0.010	0.021	<0.050							
22-Nov-21	13:15	BW	KM	KM	4.2				7.74				0.015	0.0249	0.501		<0.015		0.065								
29-Nov-21	13:10	BW	KM	KM	4.8	4.34	1152	0.7475	7.31	160.6			0.019	0.0266	0.611		<0.015		0.048								
Average					14.3	1.95	1001	0.650	7.32	65.1	0.51	3.0	0.026	0.0370	0.369	0.115	<0.015	<0.010	0.038	0.054							
n					30	19	17	17	30	17	2	10	29	30	29	10	29	10	29	10							
Std. Dev.					6.3	1.46	65	0.0423	0.20	40.0	0.04	1.7	0.0159	0.0113	0.1749	0.0907	0	0	0.0294	0.0247							
Min					2.9	0.12	921	0.598	6.97	-22.7	0.48	<1.0	0.006	0.0230	0.144	<0.010	<0.015	<0.010	0.007	<0.05							
Max					23.5	5.33	1152	0.748	7.82	160.6	0.54	<7.4	0.077	0.0687	1.10	0.212	<0.015	<0.010	0.12	0.099							
Loadings From Wetland To River, kg/yr																											
												144	1	2	18	5					2	3					

DATE	TIME (24HR)	*WEEKLY (W), BI-WEEKLY (BW), MONTHLY (M) OR YEARLY (Y)	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	RDOS AND CARO DATA									COMMENTS
					ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL KJELDAHL NITROGEN (CARO)	ORGANIC NITROGEN, CALCULATED (CARO)	TOTAL NITROGEN (CARO)	pH Grab (CARO)	TSS (RDOS)	TSS (CARO)	E.COLI (CARO)	
mm/did/yr	HR:MIN	BW/M			mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	CFU/100ml	COLOR/ORDOUR/WEATHER/ETC
2-Mar-21	11:15	M	KM	KM	0.852	0.996	0.711	0.711	0.711	7.63	4.6	3.8	5	Only measured pH and temp in field with HQ40d meter
20-May-21	11:35	M	KM	KM	0.80	1.19	1.47	1.47	1.47	7.15	1.0	9.4	10	Discharging since yesterday afternoon flow <4.5 L/s>
26-May-21	10:55	W	KM	KM	0.993	1.34					2.1			Level 37.5 cm, flow <4.6 L/s>
2-Jun-21	12:10	W	KM	KM	0.571	0.907					2		13	Hot +30C. Level 37 cm
9-Jun-21	11:10	BW	KM	KM	0.797	1.12					<1			
16-Jun-21	13:15	M	KM	KM	0.549	0.922	1.00	0.904	1.05	7.97	<1	<2.0	12	Sand Filter full
23-Jun-21	13:10	W	KM	KM	0.676	0.993					2.1			Hot 35C. Level 37.5 cm
28-Jun-21	11:08	BW	RS	KM	0.626	0.981					<1		28	Hot 40C.
8-Jul-21	10:50	W	KM	KM	0.752	1.05					1.7			Rained yesterday. Hot 30C
12-Jul-21	12:05	BW	KM	KM	0.817	1.09					<1		20	Outlet Flow ~ 1 L/s. Inlet Flow ~ 4.5 L/s. Hot smoky skies
21-Jul-21	13:25	M	KM	KM	0.613	0.912	0.790	0.710	0.790	7.95	<1	<2.0	15	Outlet Flow ~ 1 L/s. Inlet Flow ~ 4.5 L/s. Hot smoky skies
27-Jul-21	13:25	W	RS/CH	RS/CH	0.068	0.311								Outlet Flow ~ 1 L/s. Inlet Flow ~ 4.5 L/s. Hot smoky skies
4-Aug-21	11:30	BW	KM	KM	0.561	0.829					1.5		20	Outlet Flow ~ 1L/s
10-Aug-21	10:50	M	KM	KM	0.312	0.657	0.719	0.719	0.719	7.92	2.1	<2.0	6	Outlet Flow ~1.5 L/s
18-Aug-21	13:05	W	KM	KM	0.493	0.767					<1			Outlet Flow ~ 5.5 L/s
25-Aug-21	12:01	BW	KM	KM	0.655	0.903					1.5			
27-Aug-21	12:40	Coliforms	KM	KM									1410	Re-sample for coliforms as Aug 25 did not make it to lab in time
31-Aug-21	11:05	BW	KM	KM	1.04	1.42					1.8		345	Outlet Flow ~ 2 L/s. Cleaned tubing with bleach prior to sampling
7-Sep-21	15:30	BW	KM	KM	0.93	1.19					<1		<1	Outlet Flow ~ 4.2 L/s at 12 to 13" in sandfilter. Cleaned tubing with bleach prior to sampling. Field Parameters Sept 8, 2021 with YSI as HQ40d meter not working on September 7.
13-Sep-21	11:20	BW	KM	KM									248	Outlet Flow ~ 5 L/s sandfilter level @ 17". No in-house samples today. Inlet valve closed this morning.

RDOS AND CARO DATA														
DATE	TIME (24HR)	*WEEKLY (W), BI-WEEKLY (BW), MONTHLY (M) OR YEARLY (Y)	SAMPLER'S INITIALS	LAB TESTER'S INITIALS	ORGANIC NITROGEN, CALCULATED (RDOS)	TOTAL NITROGEN (RDOS)	TOTAL KJELDAHL NITROGEN (CARO)	ORGANIC NITROGEN, CALCULATED (CARO)	TOTAL NITROGEN (CARO)	pH Grab (CARO)	TSS (RDOS)	TSS (CARO)	E-COLI (CARO)	COMMENTS
mm/did/yr	HR:MIN	BW/M			mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	CFU/100ml	COLOR/ORDOUR/WEATHER/ETC
21-Sep-21	11:55	M	KM	KM	0.78	0.945	0.864	0.814	0.893	7.83	<1	<2.0	162	Inlet valve opened yesterday afternoon after Murray had racked sand filter
28-Sep-21	10:50	BW	KM	KM	0.81	1.27					<1		67	Windy and sunny. Rained last night. Very little water in sandfilter
4-Oct-21	11:10	BW	KM	KM	0.89	1.36					<1		22	13" of water in sandfilter
13-Oct-21	12:45	BW	RS	RS/KM	0.91	2.01							96	Sandfilter full. Inlet valve closed. pH and Temp measured in OKFWWTP lab. All in-house analyses October 18, 2021
19-Oct-21	11:20	M	KM	KM	0.90	1.39	0.611	0.611	0.823	7.94	<1	<2.0	23	Inlet valve closed since Oct 13. Two stop logs removed. Collected annual metals and anions samples.
25-Oct-21	11:40	BW	KM	KM	0.76	0.975					<1		19	Inlet valve closed since Oct 13. All stop logs removed. Raining some days. Very windy today.
1-Nov-21	12:10	BW	KM	KM	0.70	1.05					<1		1	Rained over weekend. ~8" water in sandfilter. Windy. Thin layer ice on Crossditch
8-Nov-21	11:45	BW	KM	KM	4.20	4.61					<1		1	~8" water in sandfilter. Sunny with light Wind.
17-Nov-21	11:30	M	KM	KM	0.83	1.28	0.642	0.642	0.813	7.97	<1	<2.0	3	Thin ice layer on Crossditch. Sandfilter empty. West end excavated Nov 15 as filling up from rainwater.
22-Nov-21	13:15	BW	KM	KM	0.89	1.39					1		2	Snow melt and rain water
29-Nov-21	13:10	BW	KM	KM	1.04	1.65					<1		2	Snow melt and rain water
Average					0.86	1.22	0.839	0.821	0.885	7.83	1.9	<2.0	110	
n					29	29	10	10	10	10	27	10	26	
Std. Dev.					0.6779	0.7246	0.280	0.28	0.251	0.27	0.97	2.8	296	
Min					0.068	0.311	0.611	0.611	0.711	7.15	1.0	<2.0	<1.0	
Max					4.20	4.61	1.47	1.47	1.47	7.99	4.6	9.4	1410	
Loadings From Wetland To River, kg/yr					41	59	40	39	42	375	93			

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results
Field Results								
Conductivity	Wetland Outlet	µS/cm	1001	921	1152	65	17	17
Dissolved oxygen	Wetland Outlet	mg/L	1.95	0.12	5.33	1.45	19	19
Oxidation reduction potential	Wetland Outlet	mV	65.1	-22.7	160.6	40	17	17
pH	Wetland Outlet		7.32	6.97	7.82	0.23	30	30
Temperature	Wetland Outlet	°C	14.3	2.9	23.5	6.3	30	30
Total dissolved solids	Wetland Outlet	mg/L	650	598	748	42	17	17
Turbidity	Wetland Outlet	NTU	0.51	0.48	0.54	0.04	2	2
Lab Results								
General								
Alkalinity (bicarbonate, as CaCO ₃)	Wetland Outlet	mg/L	269	269	269		1	1
Alkalinity (carbonate, as CaCO ₃)	Wetland Outlet	mg/L					1	0
Alkalinity (hydroxide, as CaCO ₃)	Wetland Outlet	mg/L					1	0
Alkalinity (phenolphthalein, as CaCO ₃)	Wetland Outlet	mg/L					1	0
Alkalinity (total, as CaCO ₃)	Wetland Outlet	mg/L	269	269	269		1	1
Biochemical oxygen demand	Wetland Outlet	mg/L					1	0
5-d Carbonaceous BOD	Wetland Outlet	mg/L	3	<1.0	<7.4	1.7	10	1
Chemical Oxygen Demand	Wetland Outlet	mg/L					1	0
Chloride	Wetland Outlet	mg/L	138	138	138		1	1
Conductivity	Wetland Outlet	µS/cm	985	985	985		1	1
Fluoride	Wetland Outlet	mg/L	0.2	0.2	0.2		1	1
Hardness, Total (total as CaCO ₃)	Wetland Outlet	mg/L	247	247	247		1	1
pH	Wetland Outlet		7.83	7.15	7.99	0.27	10	10
Sulphate	Wetland Outlet	mg/L	49.2	49.2	49.2		1	1
Total suspended solids	Wetland Outlet	mg/L	1.9	<2.0	9.4	2.5	12	2
UV transmittance at 254 nm - filtered	Wetland Outlet	%	69.6	69.6	69.6		1	1
Microbiological								
E. coli (MPN)	Wetland Outlet	MPN/100 mL	102	<1	1410	296	26	25
Nutrients								
Ammonia (total, as N)	Wetland Outlet	mg/L	0.054	<0.050	0.099	0.025	10	3
Nitrate (as N)	Wetland Outlet	mg/L	0.115	<0.010	0.212	0.072	10	4
Nitrite (as N)	Wetland Outlet	mg/L					10	0
Total nitrogen	Wetland Outlet	mg/L	0.885	0.711	1.47	0.234	10	10
Total kjeldahl nitrogen	Wetland Outlet	mg/L	0.839	0.611	1.47	0.26	10	10
Total organic nitrogen	Wetland Outlet	mg/L	0.821	0.642	1.47	0.271	9	9
Orthophosphate (dissolved, as P)	Wetland Outlet	mg/L					3	0
Phosphorus (total, by ICPMS/ICPOES)	Wetland Outlet	mg/L	0.057	0.057	0.057		1	1
Phosphorus (total, APHA 4500-P)	Wetland Outlet	mg/L	0.037	0.023	0.0687	0.0113	32	32
Phosphorus (dissolved, APHA 4500-P)	Wetland Outlet	mg/L	0.0236	0.0236	0.0236		1	1
Potassium (total)	Wetland Outlet	mg/L	20.3	20.3	20.3		1	1

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results
Total Metals								
Aluminum (total)	Wetland Outlet	mg/L	0.0288	0.0288	0.0288		1	1
Antimony (total)	Wetland Outlet	mg/L	0.00141	0.00141	0.00141		1	1
Arsenic (total)	Wetland Outlet	mg/L					1	0
Barium (total)	Wetland Outlet	mg/L	0.067	0.067	0.067		1	1
Beryllium (total)	Wetland Outlet	mg/L					1	0
Bismuth (total)	Wetland Outlet	mg/L					1	0
Boron (total)	Wetland Outlet	mg/L	0.211	0.211	0.211		1	1
Cadmium (total)	Wetland Outlet	mg/L					1	0
Calcium (total)	Wetland Outlet	mg/L	75.4	75.4	75.4		1	1
Chromium (total)	Wetland Outlet	mg/L	0.00115	0.00115	0.00115		1	1
Cobalt (total)	Wetland Outlet	mg/L	0.00015	0.00015	0.00015		1	1
Copper (total)	Wetland Outlet	mg/L	0.0146	0.0146	0.0146		1	1
Iron (total)	Wetland Outlet	mg/L	0.127	0.127	0.127		1	1
Lead (total)	Wetland Outlet	mg/L					1	0
Lithium (total)	Wetland Outlet	mg/L	0.00687	0.00687	0.00687		1	1
Magnesium (total)	Wetland Outlet	mg/L	14.1	14.1	14.1		1	1
Manganese (total)	Wetland Outlet	mg/L	0.00376	0.00376	0.00376		1	1
Mercury (total)	Wetland Outlet	mg/L					1	0
Molybdenum (total)	Wetland Outlet	mg/L	0.00805	0.00805	0.00805		1	1
Nickel (total)	Wetland Outlet	mg/L	0.00197	0.00197	0.00197		1	1
Selenium (total)	Wetland Outlet	mg/L					1	0
Silicon (total, as Si)	Wetland Outlet	mg/L	7.7	7.7	7.7		1	1
Silver (total)	Wetland Outlet	mg/L					1	0
Sodium (total)	Wetland Outlet	mg/L	104	104	104		1	1
Strontium (total)	Wetland Outlet	mg/L	0.586	0.586	0.586		1	1
Sulphur (total)	Wetland Outlet	mg/L	14.4	14.4	14.4		1	1
Tellurium (total)	Wetland Outlet	mg/L					1	0
Thallium (total)	Wetland Outlet	mg/L					1	0
Thorium (total)	Wetland Outlet	mg/L					1	0
Tin (total)	Wetland Outlet	mg/L	0.00054	0.00054	0.00054		1	1
Titanium (total)	Wetland Outlet	mg/L					1	0
Tungsten (total)	Wetland Outlet	mg/L					1	0
Uranium (total)	Wetland Outlet	mg/L	0.00423	0.00423	0.00423		1	1
Vanadium (total)	Wetland Outlet	mg/L					1	0
Zinc (total)	Wetland Outlet	mg/L	0.0533	0.0533	0.0533		1	1
Zirconium (total)	Wetland Outlet	mg/L	0.00016	0.00016	0.00016		1	1

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	
Date Sampled	02-Mar-21	20-May-21	26-May-21	02-Jun-21	09-Jun-21	16-Jun-21	23-Jun-21	28-Jun-21	08-Jul-21	12-Jul-21	21-Jul-21	
Lab Sample ID for analyses except bacteriological	21C0506-01	21E2486-01	21E3066-01	21F0512-02	21F1464-02	21F2438-02	21F3375-01	21F3803-01	21G1087-01	21G1401-01	21G2729-01	
Lab Sample ID for Bacteriological samples	21C0506-01	21E2484-01		21F0512-01		21F2433-02		21F3801-01		21G1379-01	21G2727-01	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
Analyte	Unit											
Field Results												
Conductivity	µS/cm					956	963	961	976		988	
Dissolved oxygen	mg/L					0.85	2.79	0.35	0.12		0.22	
Oxidation reduction potential	mV					67.2	66	61.2	12.1		-22.7	
pH		7.19	7.82	7.65	7.38	7.37	7.3	7.39	7.28	7.27	7.36	7.29
Temperature	°C	2.9	14.1	16.4	20.8	15.6	17.2	21.9	23.5	20.7	22.3	20.6
Total dissolved solids	mg/L						624	624	624	630.5		643.5
Turbidity	NTU						0.48					
Lab Results												
General												
Alkalinity (bicarbonate, as CaCO3)	mg/L											
Alkalinity (carbonate, as CaCO3)	mg/L											
Alkalinity (hydroxide, as CaCO3)	mg/L											
Alkalinity (phenolphthalein, as CaCO3)	mg/L											
Alkalinity (total, as CaCO3)	mg/L											
Biochemical oxygen demand	mg/L											
5-d Carbonaceous BOD	mg/L	<6.0	<4.9				<6.3					<5.3
Chemical Oxygen Demand	mg/L											
Chloride	mg/L											
Conductivity	µS/cm											
Fluoride	mg/L											
Hardness, Total (total as CaCO3)	mg/L											
pH		7.63	7.15				7.97					7.93
Sulphate	mg/L											
Total suspended solids	mg/L	3.8	9.4				<2.0					<2.0
UV transmittance at 254 nm - filtered	%											
Microbiological												
E. coli (MPN)	MPN/100 mL	5	10		13		12		28		20	20
Nutrients												
Ammonia (total, as N)	mg/L	<0.050	<0.050				0.099					0.075
Nitrate (as N)	mg/L	<0.010	<0.010				0.046					<0.010
Nitrite (as N)	mg/L	<0.010	<0.010				<0.010					<0.010
Total nitrogen	mg/L	0.711	1.47				1.05					0.776
Total kjeldahl nitrogen	mg/L	0.711	1.47				1.00					0.776
Total organic nitrogen	mg/L	0.711	1.47				0.904					0.701
Orthophosphate (dissolved, as P)	mg/L	<0.0050										
Phosphorus (total, by ICPMS/ICPOES)	mg/L											
Phosphorus (total, APHA 4500-P)	mg/L	0.0443	0.0501	0.0509	0.0428	0.0356	0.0289	0.0348	0.0449	0.0687	0.0616	0.045
Phosphorus (dissolved, APHA 4500-P)	mg/L											
Potassium (total)	mg/L											



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet
Date Sampled	21-Jul-21	21-Jul-21	27-Jul-21	04-Aug-21	10-Aug-21	18-Aug-21	25-Aug-21	27-Aug-21	31-Aug-21	07-Sep-21	13-Sep-21
Lab Sample ID for analyses except bacteriological	21G2729-02	21G2729-03	21G3482-01	21H0511-01	21H1188-01	21H2291-01	21H3430-01	21H3415-01	21I0161-01	21I1027-01	21I1692-01
Lab Sample ID for Bacteriological samples	21G2727-02	21G2727-03		21H0511-02	21H1180-01				21I0158-01	21I1004-01	21I1690-01
Sample Type	Duplicate	Duplicate	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit										
Field Results											
Conductivity	µS/cm				973	921				930	952
Dissolved oxygen	mg/L				0.38	2.78	2.21		1.75	2	0.19
Oxidation reduction potential	mV				2.3	55.5				76.3	64.6
pH			7.33	7.35	7.27	7.3	7.4		7.49	6.99	7.16
Temperature	°C		20.7	21.4	19.2	18.4	15.4		16	16	15.9
Total dissolved solids	mg/L				630.5	598				604.5	617.5
Turbidity	NTU										
Lab Results											
General											
Alkalinity (bicarbonate, as CaCO3)	mg/L										
Alkalinity (carbonate, as CaCO3)	mg/L										
Alkalinity (hydroxide, as CaCO3)	mg/L										
Alkalinity (phenolphthalein, as CaCO3)	mg/L										
Alkalinity (total, as CaCO3)	mg/L										
Biochemical oxygen demand	mg/L										
5-d Carbonaceous BOD	mg/L	<5.3	<5.3		<5.3						
Chemical Oxygen Demand	mg/L										
Chloride	mg/L										
Conductivity	µS/cm										
Fluoride	mg/L										
Hardness, Total (total as CaCO3)	mg/L										
pH		7.93	7.99		7.92						
Sulphate	mg/L										
Total suspended solids	mg/L	<2.0	<2.0		<2.0						
UV transmittance at 254 nm - filtered	%										
Microbiological											
E. coli (MPN)	MPN/100 mL	13	12		20	6		1410	345	<1	248
Nutrients											
Ammonia (total, as N)	mg/L	0.082	0.084			<0.050					
Nitrate (as N)	mg/L	<0.010	<0.010			<0.010					
Nitrite (as N)	mg/L	<0.010	<0.010			<0.010					
Total nitrogen	mg/L	0.855	0.739			0.719					
Total kjeldahl nitrogen	mg/L	0.855	0.739			0.719					
Total organic nitrogen	mg/L	0.773	0.655			0.719					
Orthophosphate (dissolved, as P)	mg/L										
Phosphorus (total, by ICPMS/ICPOES)	mg/L										
Phosphorus (total, APHA 4500-P)	mg/L	0.0597	0.0465	0.0403	0.0469	0.0384	0.0269	0.023	0.0366	0.0298	0.0371
Phosphorus (dissolved, APHA 4500-P)	mg/L										
Potassium (total)	mg/L										



Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet	Wetland Outlet
Date Sampled	21-Sep-21	28-Sep-21	04-Oct-21	13-Oct-21	19-Oct-21	25-Oct-21	01-Nov-21	08-Nov-21	17-Nov-21	22-Nov-21	29-Nov-21	
Lab Sample ID for analyses except bacteriological	21I2980-01	21I3945-01	21J0508-01	21J1856-01	21J2678-01	21J4077-01	21K0189-01	21K1273-01	21K2417-01	21K2912-01	21K3800-01	
Lab Sample ID for Bacteriological samples	21I2979-01	21I3943-01	21J0507-01	21J1852-01	21J2676-01	21J3503-01	21K0195-01	21K1274-01	21K2416-01	21K2911-01	21K3799-01	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit											
Field Results												
Conductivity	µS/cm	974	988	1014			1017	1049	1092	1114		1152
Dissolved oxygen	mg/L	2.99	1.48	1.41			1.16	1.93	5.33	3.9		4.34
Oxidation reduction potential	mV	83.3	74.8	75.8			82.8	77.1	84.1	85.8		160.6
pH		7.17	6.97	7.05	7.29	7.54	7.3	7.1	7.1	7.42	7.74	7.31
Temperature	°C	13.5	13.1	10.5	9.3	8.2	9.1	5.4	5.7	5.1	4.2	4.8
Total dissolved solids	mg/L	630.5	643.5	656.5			663	682.5	708.6	721.5		747.5
Turbidity	NTU								0.54			
Lab Results												
General												
Alkalinity (bicarbonate, as CaCO3)	mg/L					269						
Alkalinity (carbonate, as CaCO3)	mg/L					<1.0						
Alkalinity (hydroxide, as CaCO3)	mg/L					<1.0						
Alkalinity (phenolphthalein, as CaCO3)	mg/L					<1.0						
Alkalinity (total, as CaCO3)	mg/L					269						
Biochemical oxygen demand	mg/L					<1.0						
5-d Carbonaceous BOD	mg/L	<7.4				<1.0			7.1			
Chemical Oxygen Demand	mg/L					<20						
Chloride	mg/L					138						
Conductivity	µS/cm					985						
Fluoride	mg/L					0.2						
Hardness, Total (total as CaCO3)	mg/L					247						
pH		7.83				7.94				7.97		
Sulphate	mg/L					49.2						
Total suspended solids	mg/L	<2.0				<2.0				<2.0		
UV transmittance at 254 nm - filtered	%					69.6						
Microbiological												
E. coli (MPN)	MPN/100 mL	162	67	22	96	23	19	1	1	3	2	2
Nutrients												
Ammonia (total, as N)	mg/L	0.05				<0.050				<0.050		
Nitrate (as N)	mg/L	0.029				0.212				0.171		
Nitrite (as N)	mg/L	<0.010				<0.010				<0.010		
Total nitrogen	mg/L	0.893				0.823				0.813		
Total kjeldahl nitrogen	mg/L	0.864				0.611				0.642		
Total organic nitrogen	mg/L	0.814								0.642		
Orthophosphate (dissolved, as P)	mg/L					<0.0050						
Phosphorus (total, by ICPMS/ICPOES)	mg/L					0.057						
Phosphorus (total, APHA 4500-P)	mg/L	0.0319	0.0343	0.0316	0.0245	0.026	0.0351	0.0282	0.031	0.0241	0.0249	0.0266
Phosphorus (dissolved, APHA 4500-P)	mg/L					0.0236						
Potassium (total)	mg/L					20.3						

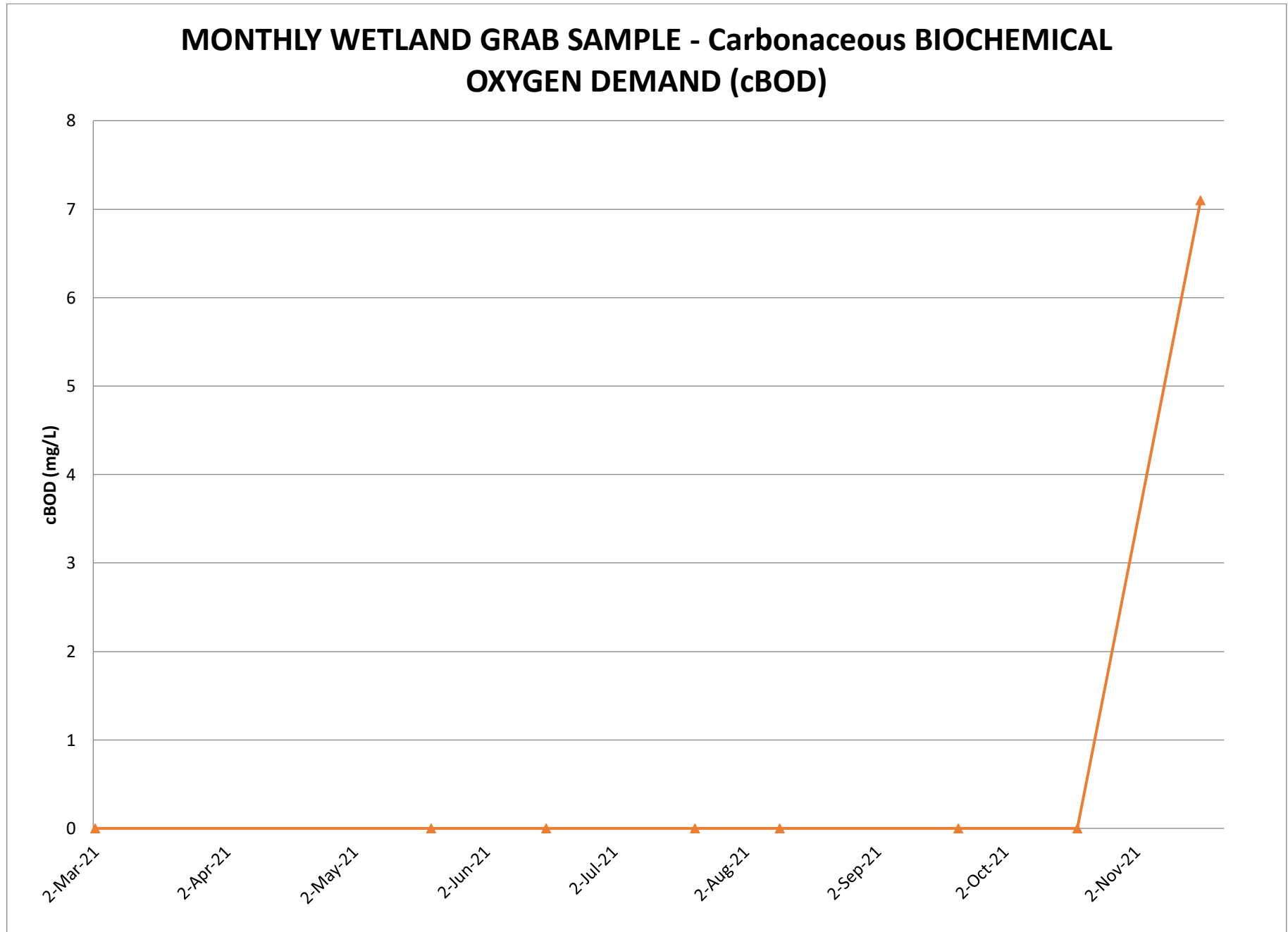


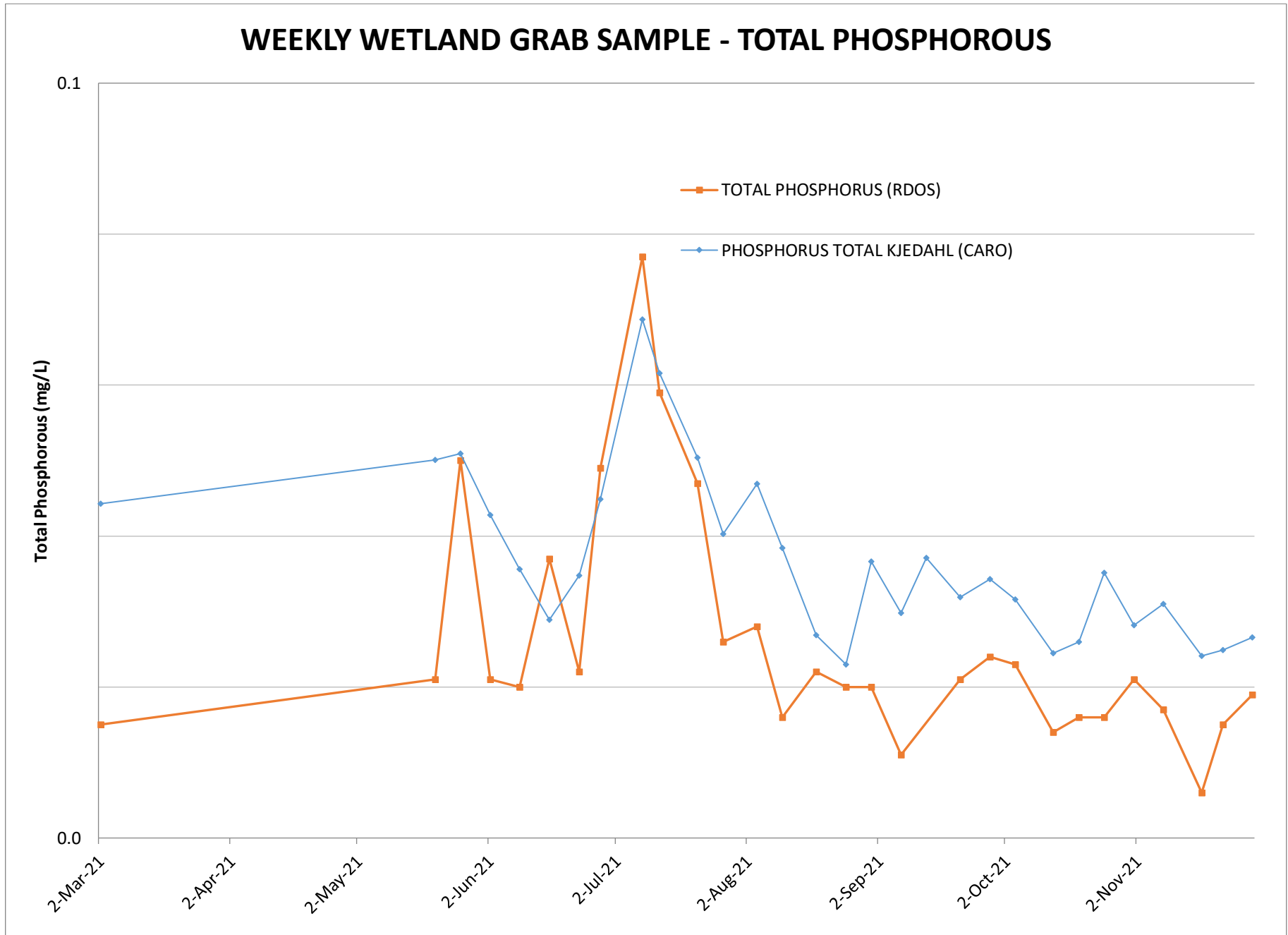
Okanagan Falls Advanced Wastewater Treatment Facility

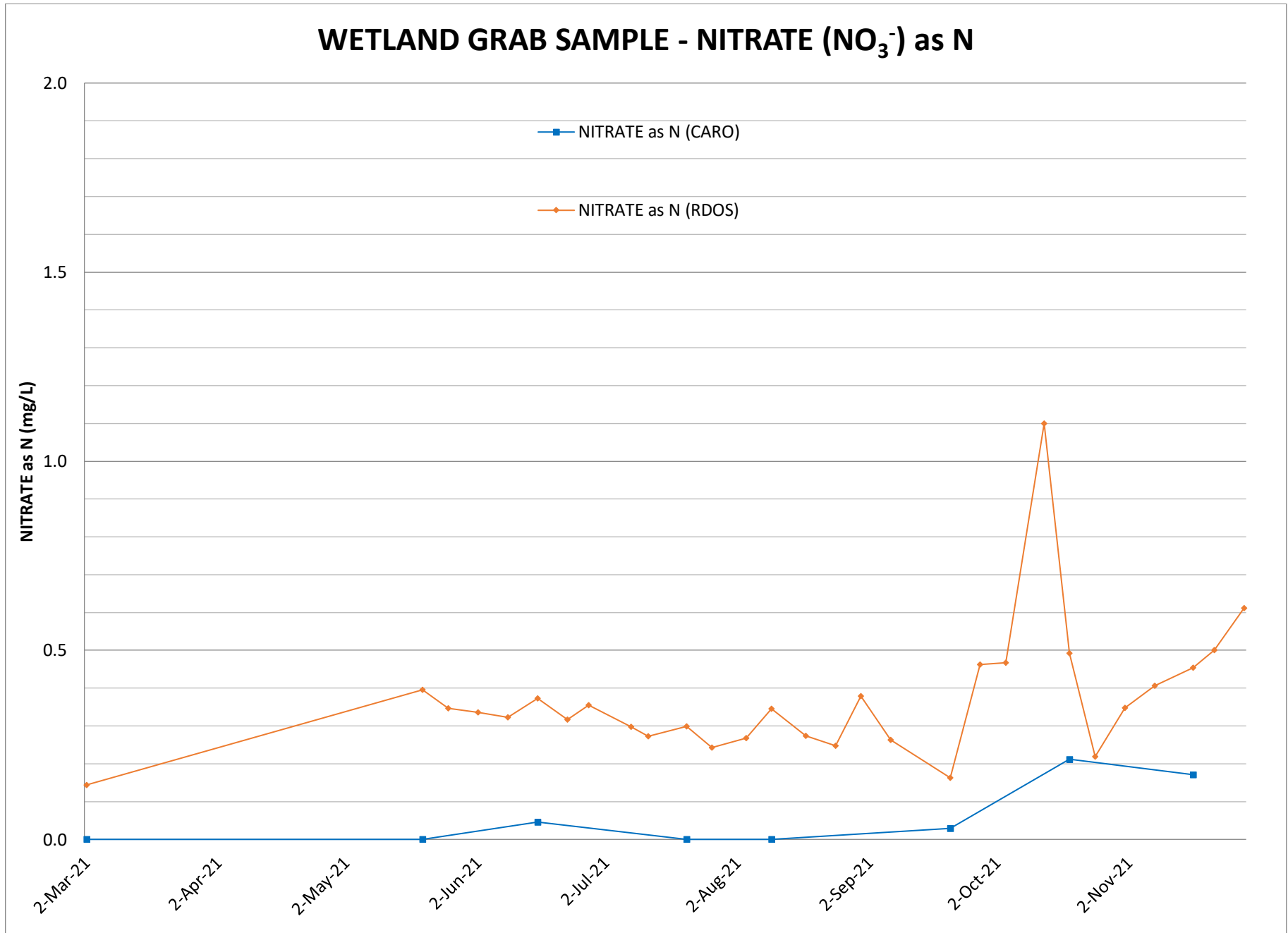
Water Quality Results

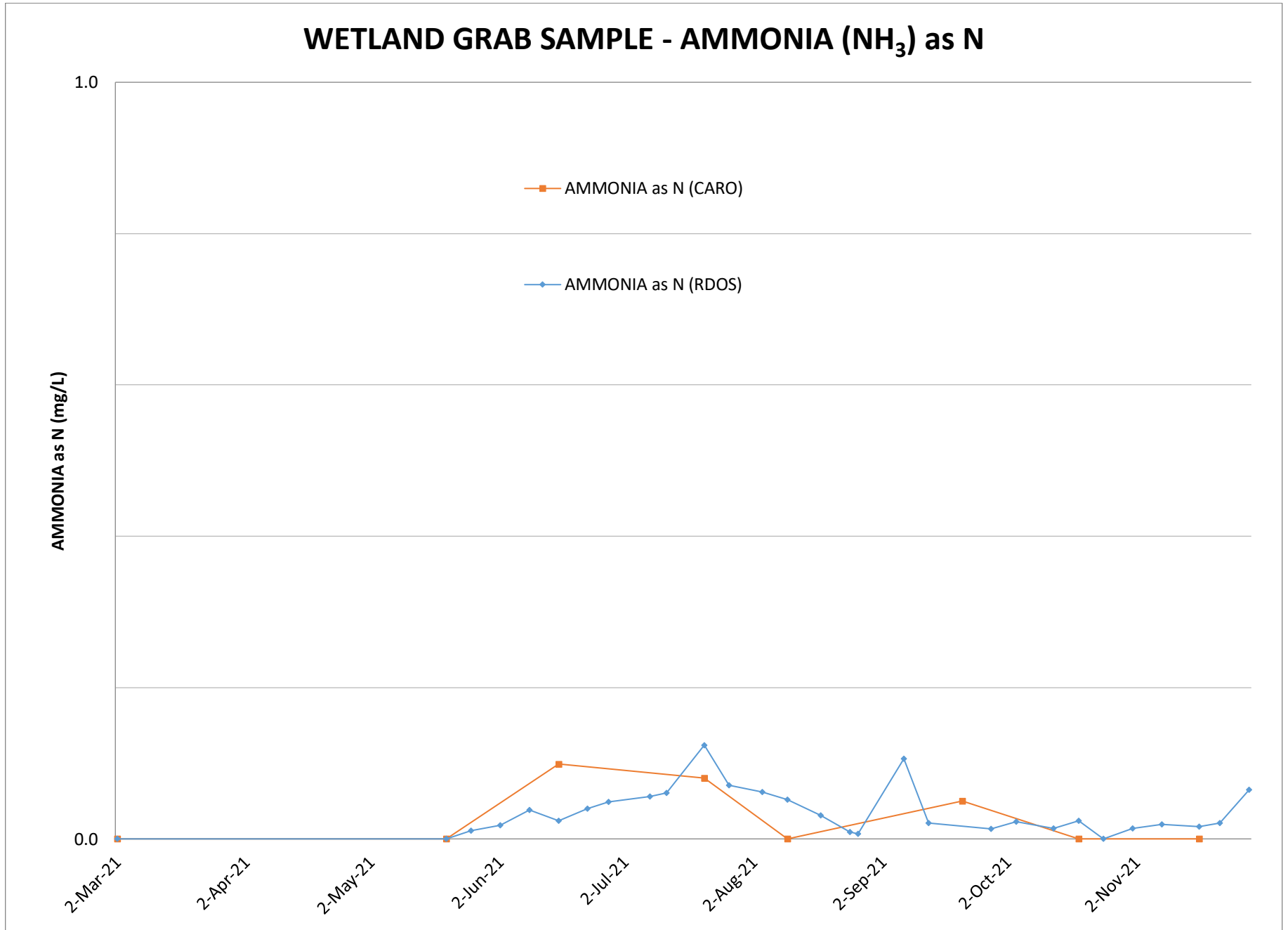
	Sampling Location	Wetland Outlet
	Date Sampled	19-Oct-21
	Lab Sample ID	21J2678-01
	Sample Type	Normal
Analyte	Unit	
Field Results		
pH		7.54
Temperature	°C	8.2
Lab Results		
Total Metals		
Aluminum (total)	mg/L	0.0288
Antimony (total)	mg/L	0.00141
Arsenic (total)	mg/L	<0.00050
Barium (total)	mg/L	0.067
Beryllium (total)	mg/L	<0.00010
Bismuth (total)	mg/L	<0.00010
Boron (total)	mg/L	0.211
Cadmium (total)	mg/L	<0.000010
Calcium (total)	mg/L	75.4
Chromium (total)	mg/L	0.00115
Cobalt (total)	mg/L	0.00015
Copper (total)	mg/L	0.0146
Iron (total)	mg/L	0.127
Lead (total)	mg/L	<0.00020
Lithium (total)	mg/L	0.00687
Magnesium (total)	mg/L	14.1
Manganese (total)	mg/L	0.00376
Mercury (total)	mg/L	<0.000010
Molybdenum (total)	mg/L	0.00805
Nickel (total)	mg/L	0.00197
Selenium (total)	mg/L	<0.00050
Silicon (total, as Si)	mg/L	7.7
Silver (total)	mg/L	<0.000050
Sodium (total)	mg/L	104
Strontium (total)	mg/L	0.586
Sulphur (total)	mg/L	14.4
Tellurium (total)	mg/L	<0.00050
Thallium (total)	mg/L	<0.000020
Thorium (total)	mg/L	<0.00010
Tin (total)	mg/L	0.00054
Titanium (total)	mg/L	<0.0050
Tungsten (total)	mg/L	<0.0010
Uranium (total)	mg/L	0.00423
Vanadium (total)	mg/L	<0.0010
Zinc (total)	mg/L	0.0533
Zirconium (total)	mg/L	0.00016

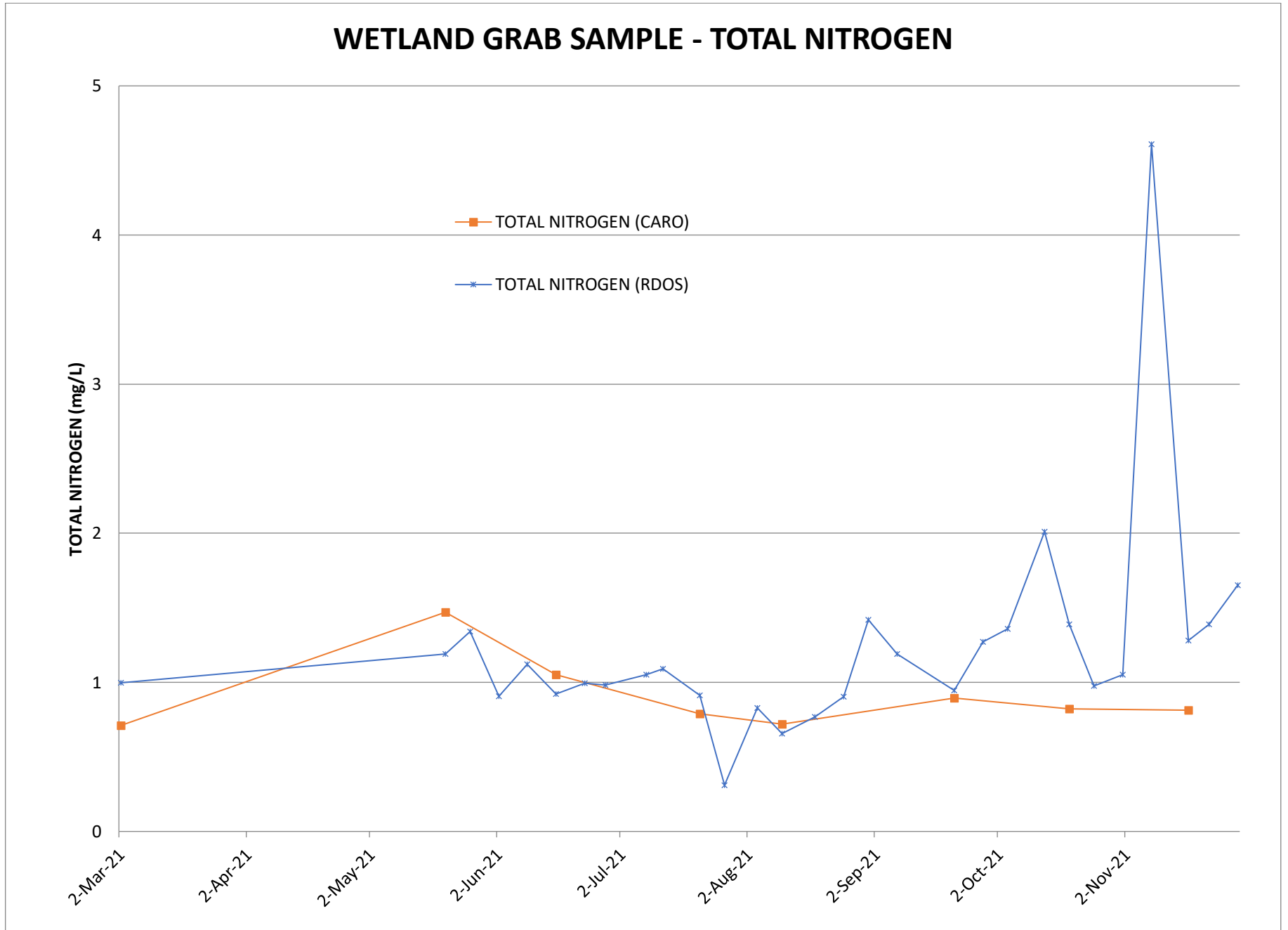


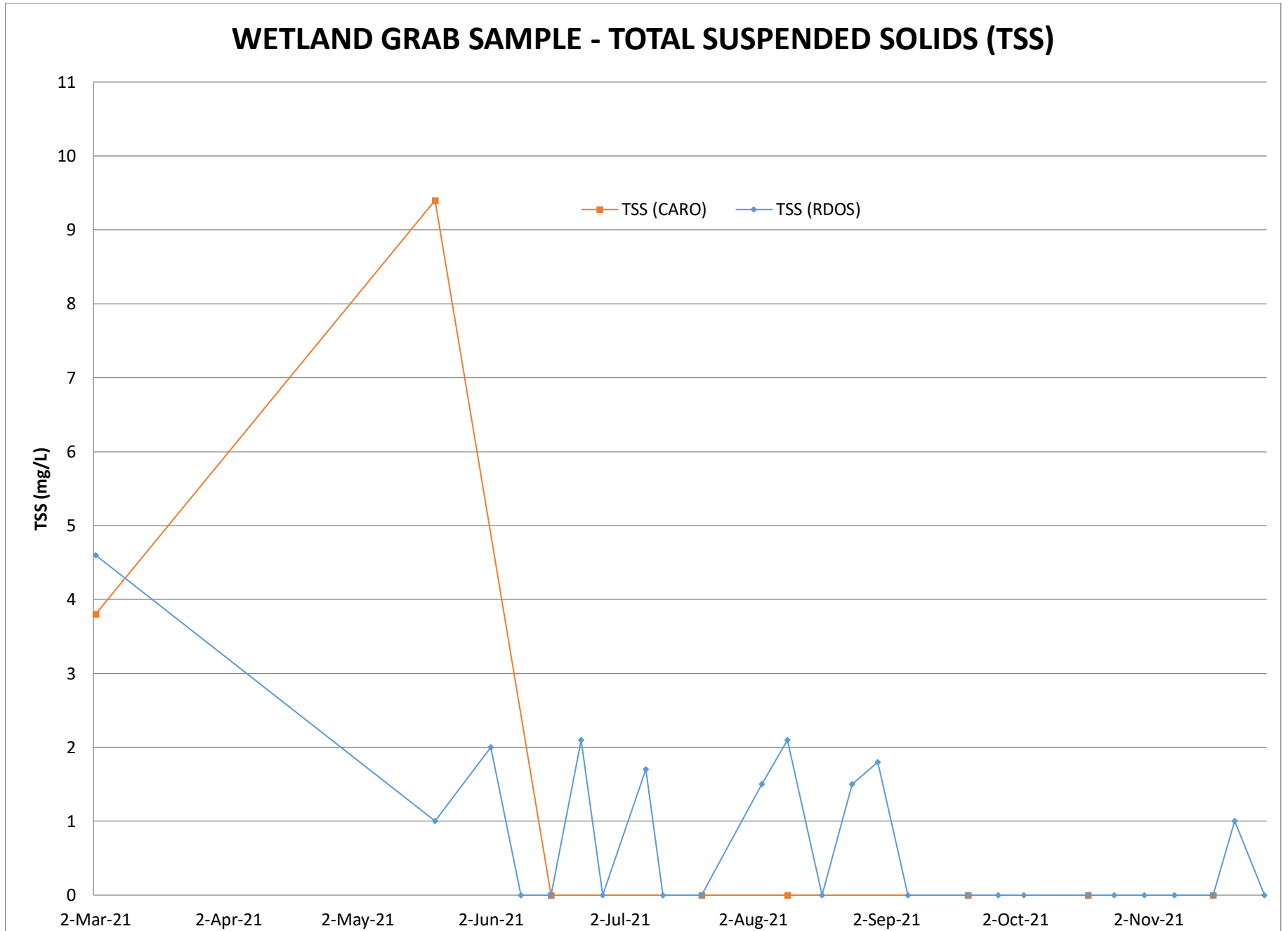


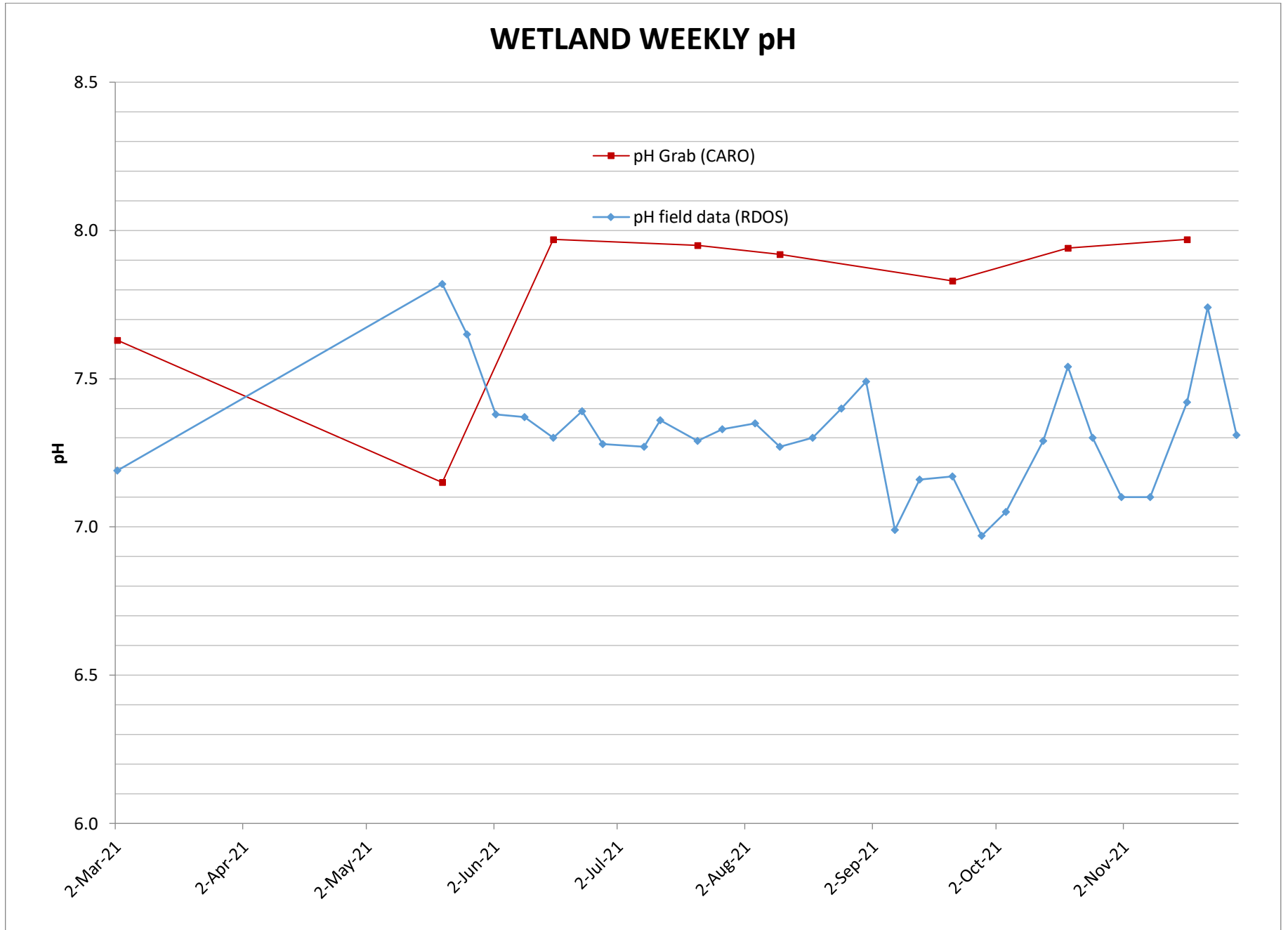


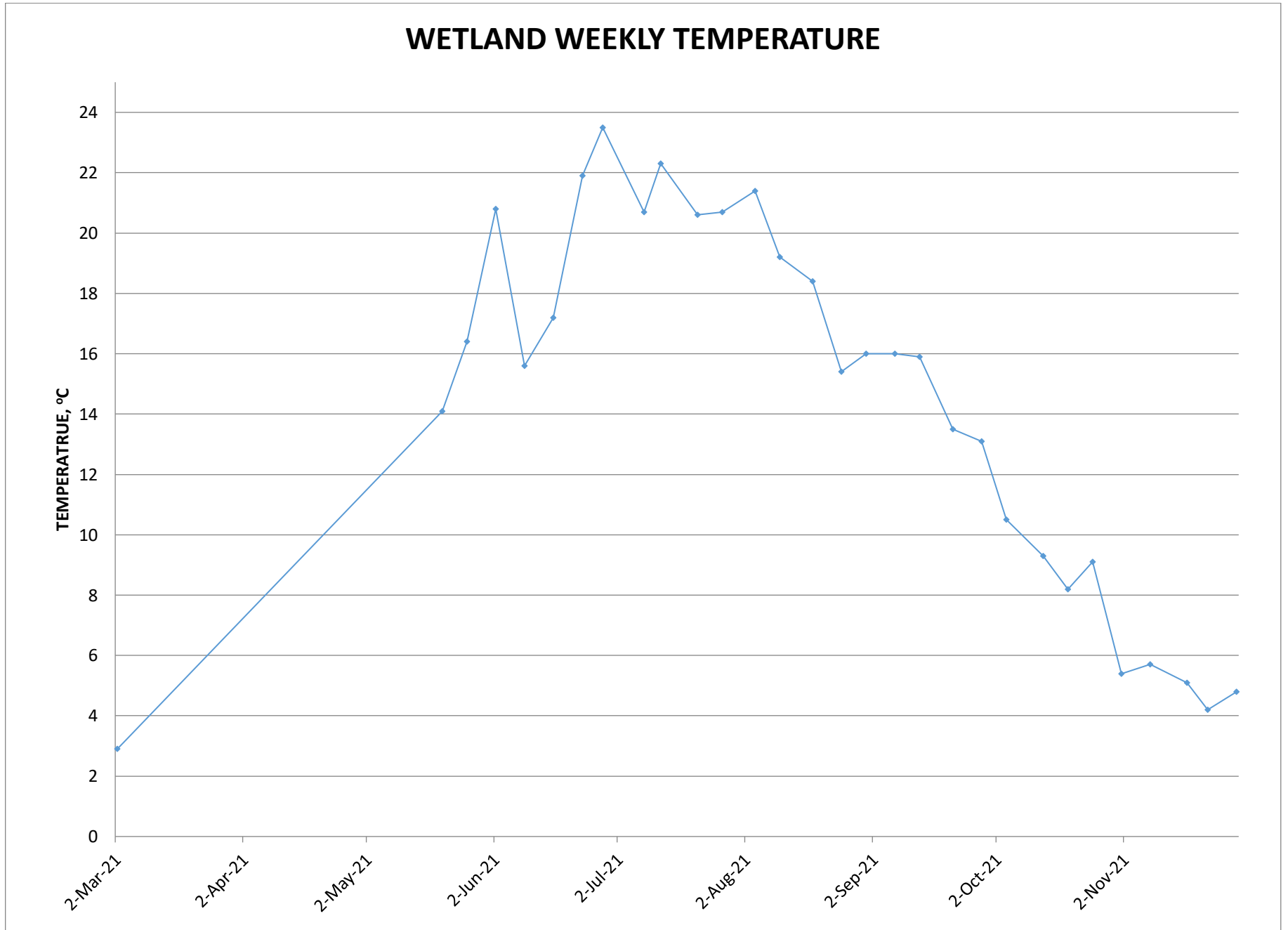


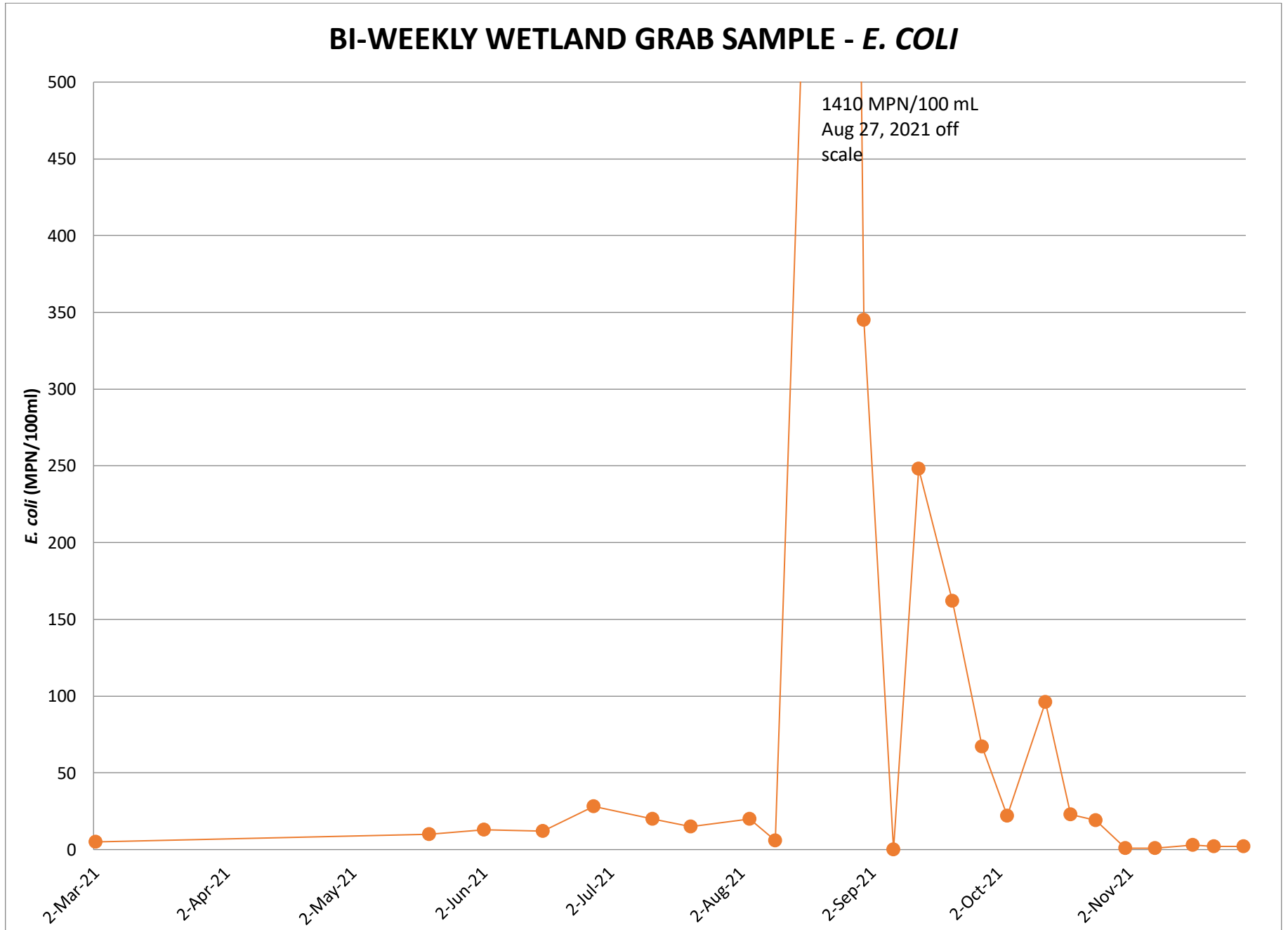












APPENDIX N

Wetland Monitoring 2021 Lab Reports

CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCW

PROJECT INFO

WORK ORDER 21C0506

RECEIVED / TEMP 2021-03-03 13:05 / 5°C

REPORTED 2021-03-10 10:00

COC NUMBER B096719

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.

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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.

Work Order Comments:

Custody Seals Intact: YES

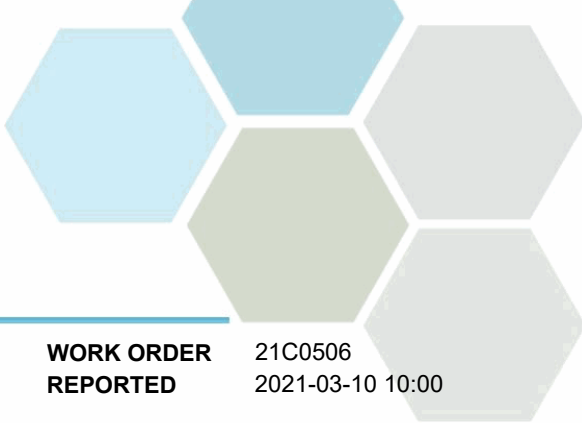
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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TEST RESULTS

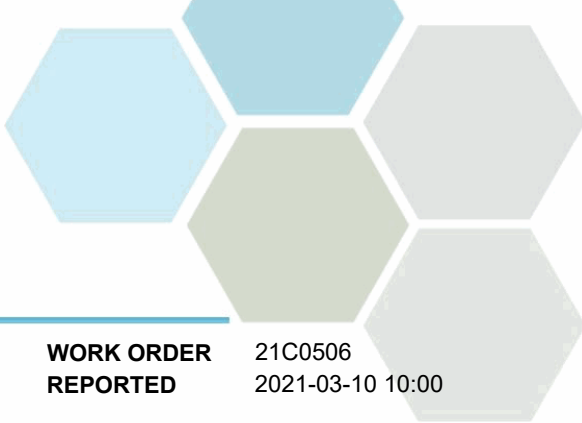
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21C0506
2021-03-10 10:00

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21C0506-01) Matrix: Water Sampled: 2021-03-02 11:15					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-03-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-03-03	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-03-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.711	0.0500	mg/L	N/A	
Nitrogen, Organic	0.711	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-03-04	
BOD, 5-day Carbonaceous	< 6.0	2.0	mg/L	2021-03-09	
Nitrogen, Total Kjeldahl	0.711	0.050	mg/L	2021-03-05	
pH	7.63	0.10	pH units	2021-03-08	HT2
Phosphorus, Total (as P)	0.0443	0.0050	mg/L	2021-03-05	
Solids, Total Suspended	3.8	2.0	mg/L	2021-03-09	
Microbiological Parameters					
E. coli (Q-Tray)	5	1	MPN/100 mL	2021-03-03	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21C0506
2021-03-10 10:00

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	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
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E2484
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-21 12:15 / 6.9°C
PO NUMBER	OK Falls WW	REPORTED	2021-05-25 11:05
PROJECT	OK Falls WWTP MCW	COC NUMBER	B099125
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

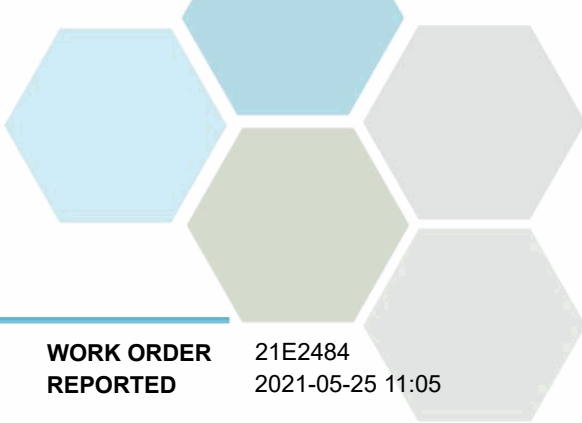
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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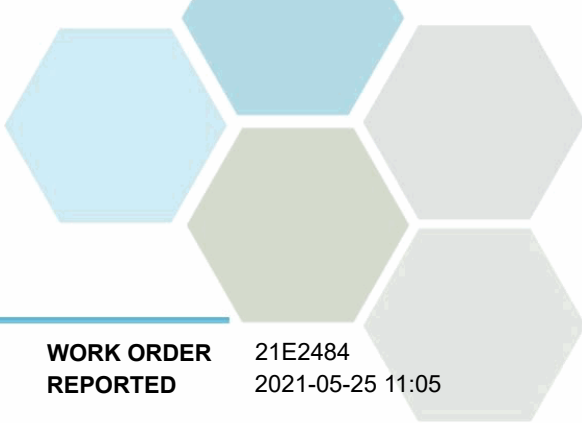


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21E2484
2021-05-25 11:05

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP Wetland Outlet - Bacteria (21E2484-01) Matrix: Water Sampled: 2021-05-20 11:35					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	10	1	MPN/100 mL	2021-05-21	
NW Cross Ditch Sand Filter - Bacteria (21E2484-02) Matrix: Water Sampled: 2021-05-20 11:50					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	23	1	MPN/100 mL	2021-05-21	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21E2484
2021-05-25 11:05

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E2486
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-21 12:15 / 6.9°C
PO NUMBER	OK Falls WW	REPORTED	2021-05-31 13:51
PROJECT	OK Falls WWTP MCW	COC NUMBER	B099125
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

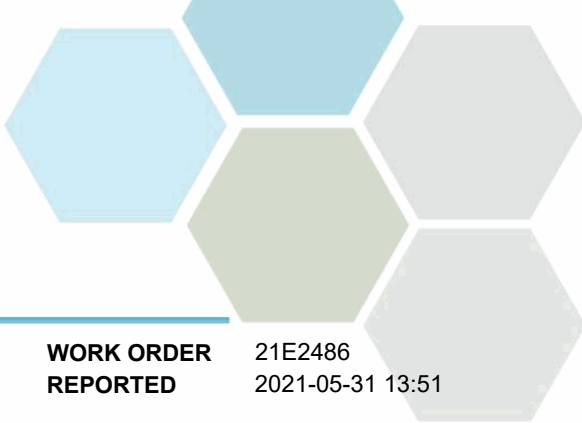
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21E2486
2021-05-31 13:51

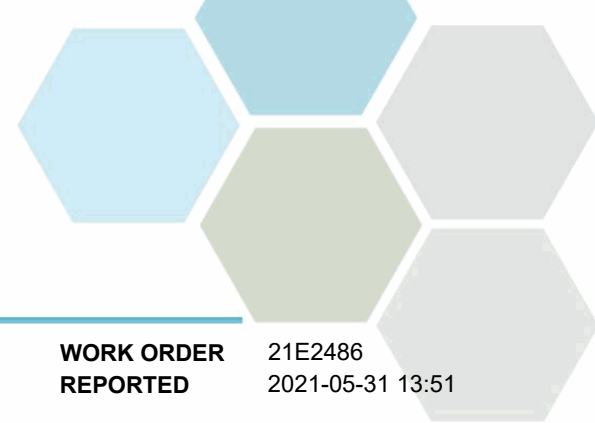
Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21E2486-01) Matrix: Water Sampled: 2021-05-20 11:35					
<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-05-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-22	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	1.47	0.0500	mg/L	N/A	
Nitrogen, Organic	1.47	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-05-26	
BOD, 5-day Carbonaceous	< 4.9	2.0	mg/L	2021-05-26	
Nitrogen, Total Kjeldahl	1.47	0.050	mg/L	2021-05-31	
pH	7.15	0.10	pH units	2021-05-25	HT2
Phosphorus, Total (as P)	0.0501	0.0050	mg/L	2021-05-28	
Solids, Total Suspended	9.4	2.0	mg/L	2021-05-28	HT1

NW Cross Ditch By Sand Filter (21E2486-02) | Matrix: Water | Sampled: 2021-05-20 11:50

<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-05-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-22	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	1.71	0.0500	mg/L	N/A	
Nitrogen, Organic	1.63	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.084	0.050	mg/L	2021-05-26	
BOD, 5-day Carbonaceous	15.0	2.0	mg/L	2021-05-26	
Nitrogen, Total Kjeldahl	1.71	0.050	mg/L	2021-05-31	
pH	7.17	0.10	pH units	2021-05-25	HT2
Phosphorus, Total (as P)	0.0517	0.0050	mg/L	2021-05-28	
Solids, Total Suspended	2.2	2.0	mg/L	2021-05-28	HT1

Sample Qualifiers:

- 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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21E2486
2021-05-31 13:51

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E3066
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-27 12:40 / 8.4°C
PO NUMBER	OK Falls WW	COC NUMBER	B099127
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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.

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Work Order Comments:

Custody Seals Intact: YES

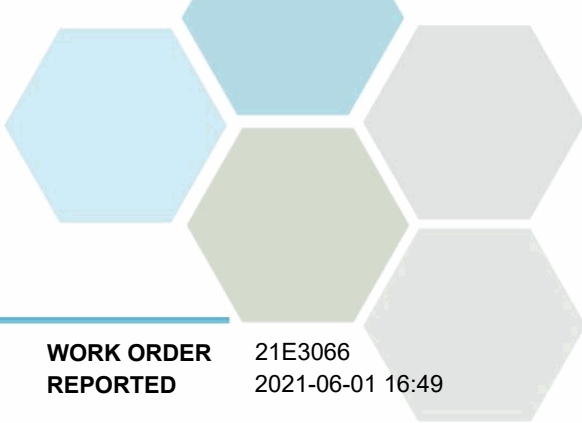
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

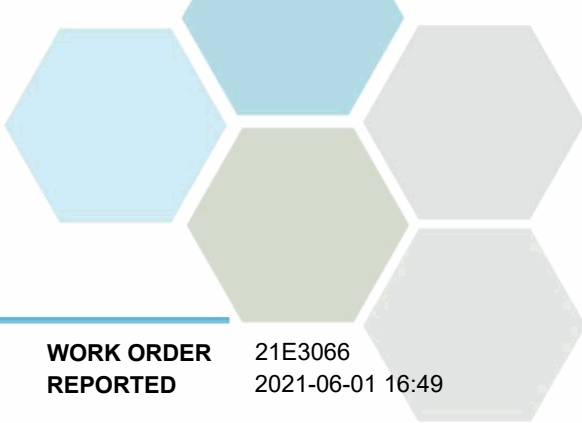
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21E3066
2021-06-01 16:49

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21E3066-01) Matrix: Water Sampled: 2021-05-26 10:55					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0509	0.0050	mg/L	2021-06-01	
NW Cross Ditch By Sand Filter (21E3066-02) Matrix: Water Sampled: 2021-05-26 11:05					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0772	0.0050	mg/L	2021-06-01	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21E3066
2021-06-01 16:49

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F0512
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-03 09:50 / 8.3°C 2021-06-09 11:24
PO NUMBER	OK Falls WW	COC NUMBER	B099113
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

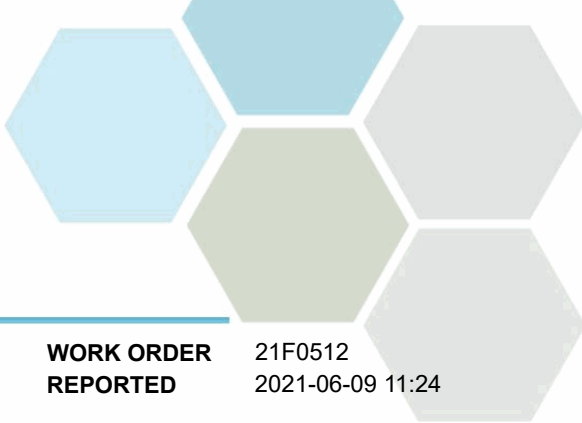
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F0512
2021-06-09 11:24

Analyte	Result	RL	Units	Analyzed	Qualifier
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OKFWWTP Wetland Outlet - Bacteria (21F0512-01) | Matrix: Water | Sampled: 2021-06-02 12:10

Microbiological Parameters

E. coli (Q-Tray)	13	1	MPN/100 mL	2021-06-03	
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OKFWWTP - Wetland Outlet (21F0512-02) | Matrix: Water | Sampled: 2021-06-02 12:10

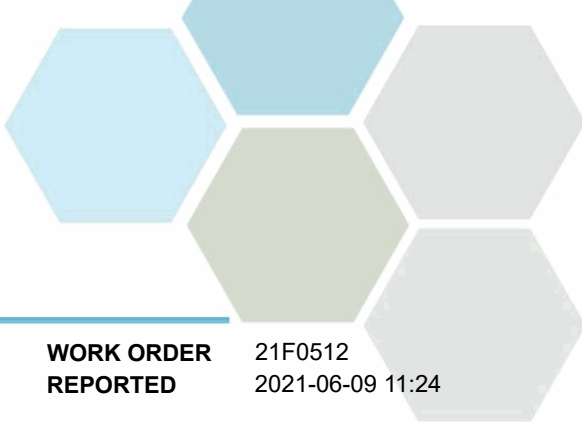
PRES

General Parameters

Phosphorus, Total (as P)	0.0428	0.0050	mg/L	2021-06-08	
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Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F0512
2021-06-09 11:24

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F1464
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-10 13:20 / 3.8°C
PO NUMBER	OK Falls WW	COC NUMBER	B099128
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

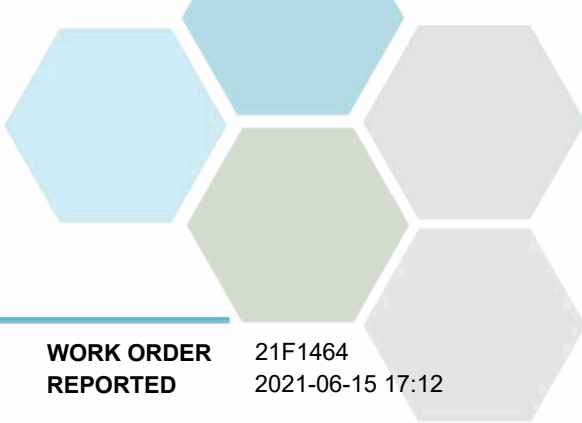
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

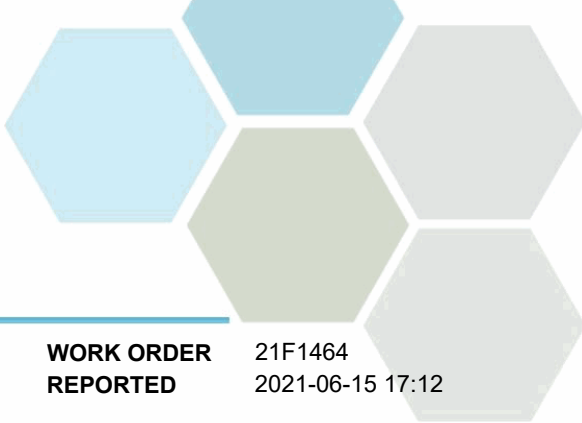
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F1464
2021-06-15 17:12

Analyte	Result	RL	Units	Analyzed	Qualifier
NW Cross Ditch By Sand Filter (21F1464-01) Matrix: Water Sampled: 2021-06-09 11:10					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0413	0.0050	mg/L	2021-06-15	PRES

OKFWWTP Wetland Outlet - Bacteria (21F1464-02) Matrix: Water Sampled: 2021-06-09 11:20					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0356	0.0050	mg/L	2021-06-15	

Sample Qualifiers:
PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F1464
2021-06-15 17:12

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F2433
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-17 12:10 / 5.4°C
PO NUMBER	OK Falls WW	COC NUMBER	B099114
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

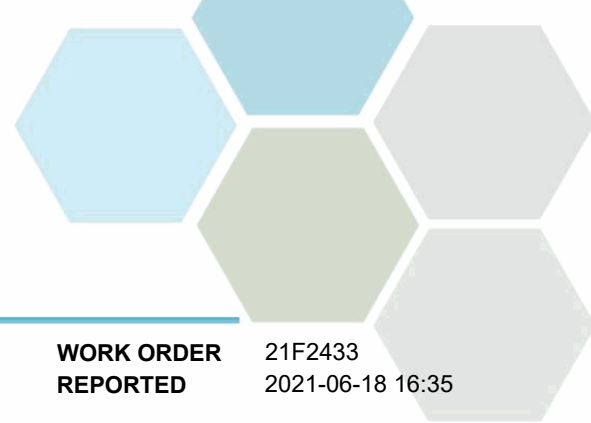
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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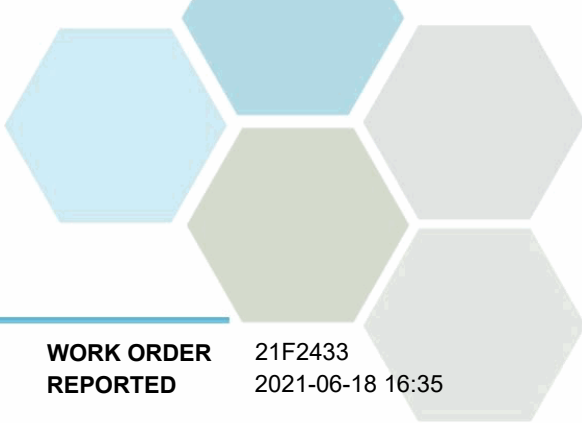


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F2433
2021-06-18 16:35

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - South Ditch (21F2433-01) Matrix: Water Sampled: 2021-06-16 12:00					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	158	1	MPN/100 mL	2021-06-17	
OKFWWTP Wetland Outlet - Bacteria (21F2433-02) Matrix: Water Sampled: 2021-06-16 13:15					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	12	1	MPN/100 mL	2021-06-17	
NW Cross Ditch Sand Filter - Bacteria (21F2433-03) Matrix: Water Sampled: 2021-06-16 13:35					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	91	1	MPN/100 mL	2021-06-17	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F2433
2021-06-18 16:35

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCW

PROJECT INFO

WORK ORDER 21F2438

RECEIVED / TEMP REPORTED 2021-06-17 12:10 / 5.4°C
2021-06-24 11:47

COC NUMBER B099114

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.

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Work Order Comments:

Custody Seals Intact: YES

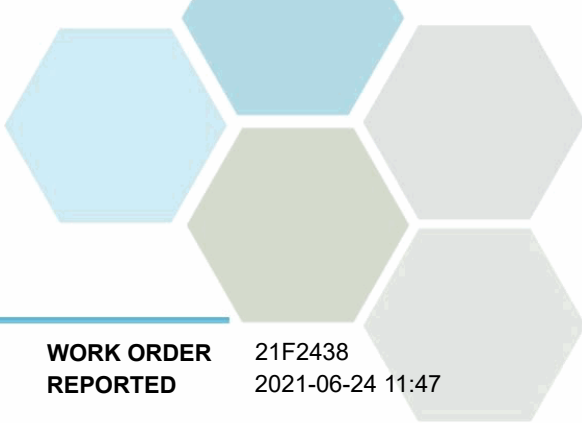
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F2438
2021-06-24 11:47

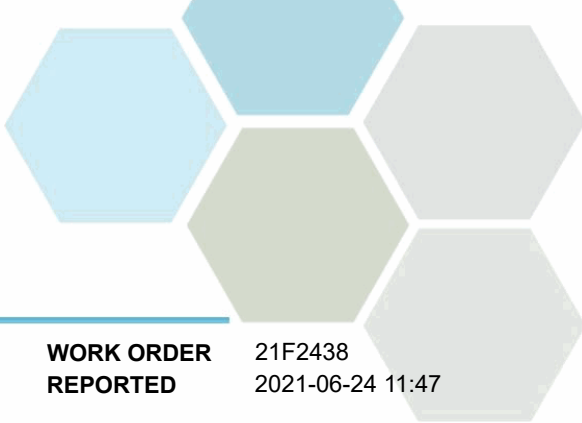
Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - South Ditch (21F2438-01) Matrix: Water Sampled: 2021-06-16 12:00					
<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-06-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-19	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	1.23	0.0500	mg/L	N/A	
Nitrogen, Organic	1.17	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.055	0.050	mg/L	2021-06-18	
BOD, 5-day Carbonaceous	< 6.3	2.0	mg/L	2021-06-23	
Nitrogen, Total Kjeldahl	1.23	0.050	mg/L	2021-06-23	
pH	8.07	0.10	pH units	2021-06-23	HT2
Phosphorus, Total (as P)	0.130	0.0050	mg/L	2021-06-23	
Solids, Total Suspended	14.4	2.0	mg/L	2021-06-20	

OKFWWTP - Wetland Outlet (21F2438-02) | Matrix: Water | Sampled: 2021-06-16 13:15

<i>Anions</i>					
Nitrate (as N)	0.046	0.010	mg/L	2021-06-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-19	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	0.0455	0.0100	mg/L	N/A	
Nitrogen, Total	1.05	0.0500	mg/L	N/A	
Nitrogen, Organic	0.904	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.099	0.050	mg/L	2021-06-18	
BOD, 5-day Carbonaceous	< 6.3	2.0	mg/L	2021-06-23	
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	2021-06-23	
pH	7.97	0.10	pH units	2021-06-23	HT2
Phosphorus, Total (as P)	0.0289	0.0050	mg/L	2021-06-23	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-20	

NW Cross Ditch By Sand Filter (21F2438-03) | Matrix: Water | Sampled: 2021-06-16 13:35

<i>Anions</i>					
Nitrate (as N)	0.104	0.010	mg/L	2021-06-19	
Nitrite (as N)	0.040	0.010	mg/L	2021-06-19	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	0.144	0.0100	mg/L	N/A	
Nitrogen, Total	1.23	0.0500	mg/L	N/A	



TEST RESULTS

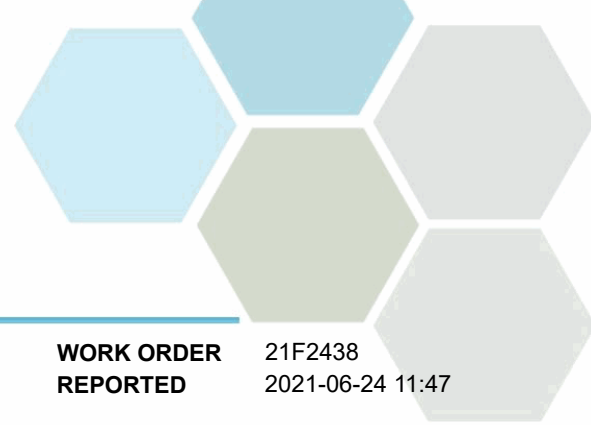
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F2438
2021-06-24 11:47

Analyte	Result	RL	Units	Analyzed	Qualifier
NW Cross Ditch By Sand Filter (21F2438-03) Matrix: Water Sampled: 2021-06-16 13:35, Continued					
<i>Calculated Parameters, Continued</i>					
Nitrogen, Organic	1.01	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.083	0.050	mg/L	2021-06-18	
BOD, 5-day Carbonaceous	< 6.3	2.0	mg/L	2021-06-23	
Nitrogen, Total Kjeldahl	1.09	0.050	mg/L	2021-06-23	
pH	7.98	0.10	pH units	2021-06-23	HT2
Phosphorus, Total (as P)	0.0331	0.0050	mg/L	2021-06-23	
Solids, Total Suspended	2.8	2.0	mg/L	2021-06-20	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F2438
2021-06-24 11:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F3375
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-24 14:00 / 15.4°C 2021-06-29 16:18
PO NUMBER	OK Falls WW	COC NUMBER	B099117
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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Work Order Comments:

Custody Seals Intact: YES

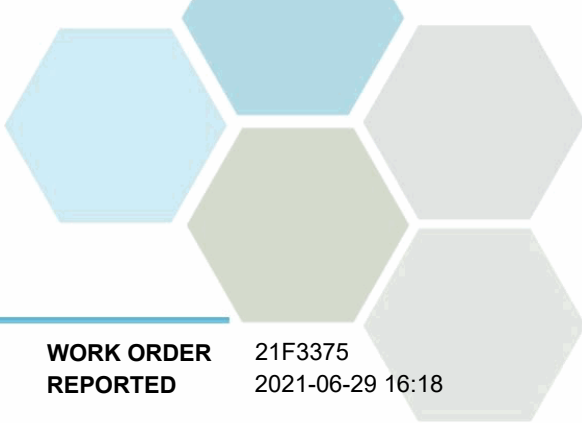
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

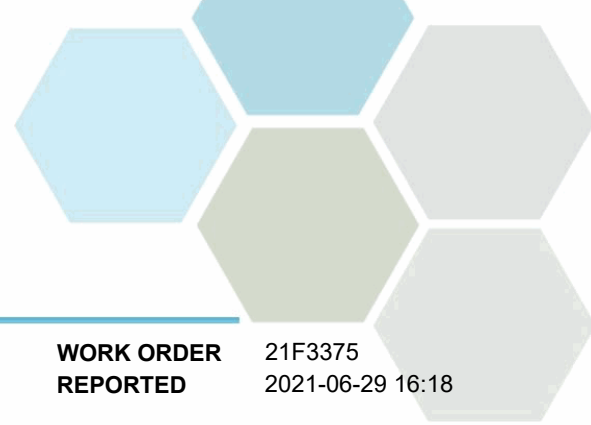
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F3375
2021-06-29 16:18

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21F3375-01) Matrix: Water Sampled: 2021-06-23 13:10					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0348	0.0050	mg/L	2021-06-29	HT1

NW Cross Ditch By Sand Filter (21F3375-02) Matrix: Water Sampled: 2021-06-23 13:10					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0352	0.0050	mg/L	2021-06-29	HT1

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F3375
2021-06-29 16:18

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F3801
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-29 12:14 / 4.1°C
PO NUMBER	OK Falls WW	REPORTED	2021-06-30 15:38
PROJECT	OK Falls WWTP MCW	COC NUMBER	B099119
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

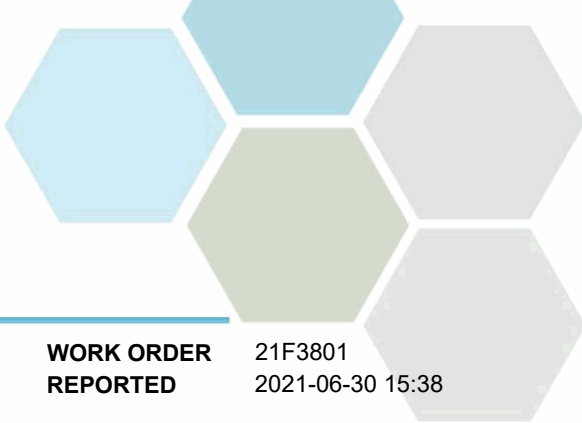
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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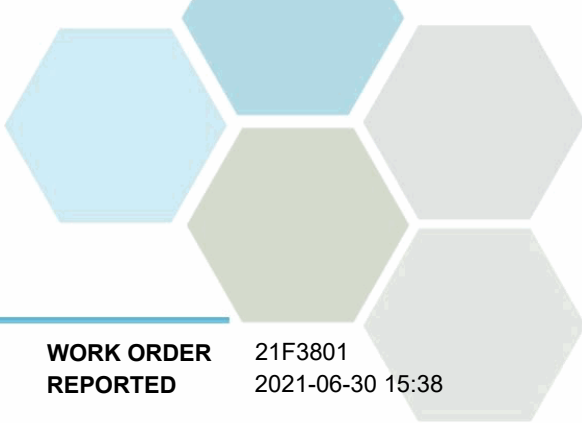


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F3801
2021-06-30 15:38

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP Wetland Outlet - Bacteria (21F3801-01) Matrix: Water Sampled: 2021-06-28 11:08					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	28	1	MPN/100 mL	2021-06-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F3801
2021-06-30 15:38

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F3803
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-29 12:14 / 4.1°C 2021-07-06 16:56
PO NUMBER	OK Falls WW	COC NUMBER	B099119
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

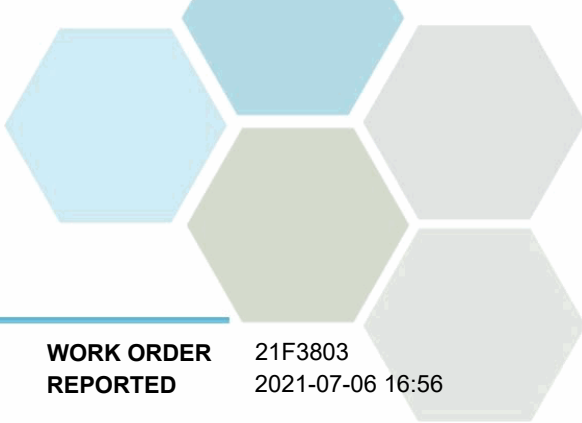
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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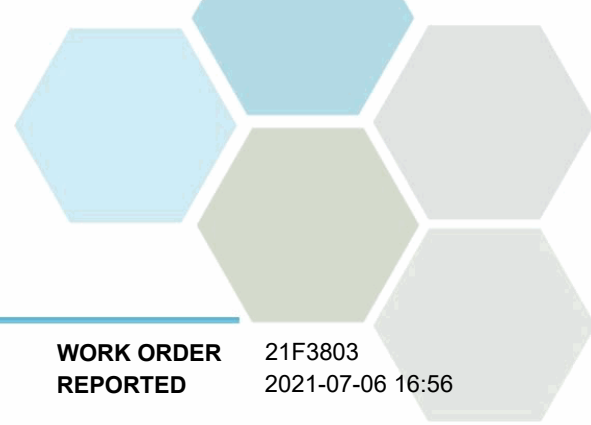


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F3803
2021-07-06 16:56

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21F3803-01) Matrix: Water Sampled: 2021-06-28 11:08					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0449	0.0050	mg/L	2021-07-06	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21F3803
2021-07-06 16:56

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G1087
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-09 13:20 / 7.9°C 2021-07-16 10:59
PO NUMBER	OK Falls WW	COC NUMBER	B099111
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

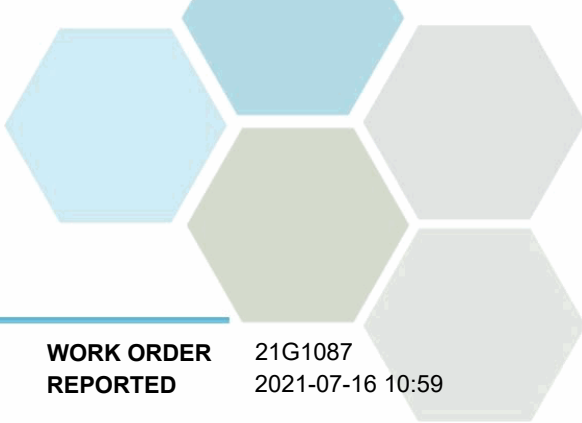
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

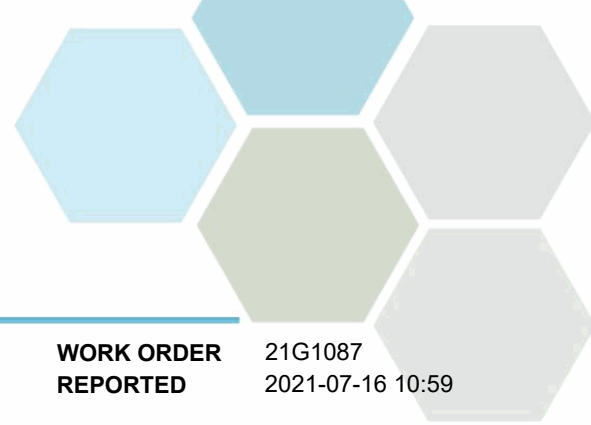
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G1087
2021-07-16 10:59

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21G1087-01) Matrix: Water Sampled: 2021-07-08 10:50					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0687	0.0050	mg/L	2021-07-15	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G1087
2021-07-16 10:59

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G1379
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-13 12:05 / 8.6°C
PO NUMBER	OK Falls WW	COC NUMBER	B099110
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

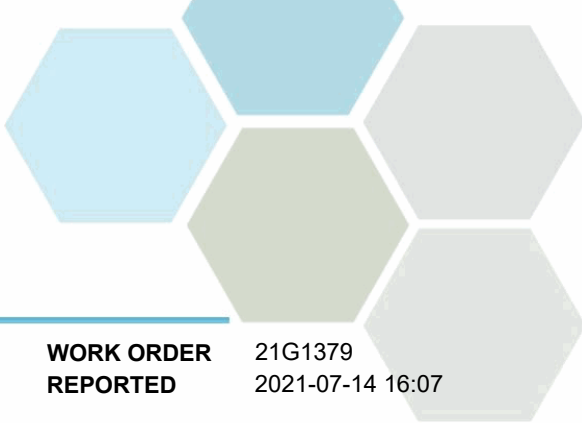
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

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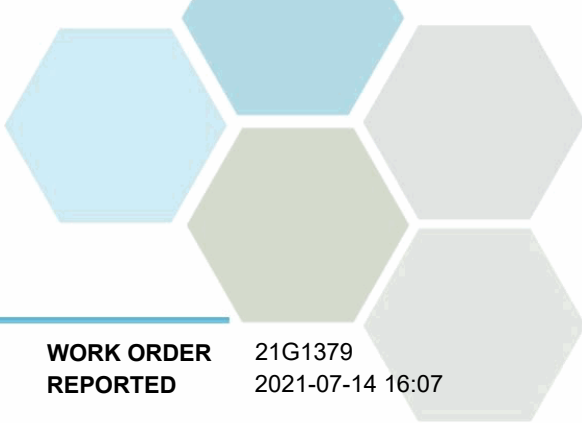


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G1379
2021-07-14 16:07

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP Wetland Outlet - Bacteria (21G1379-01) Matrix: Water Sampled: 2021-07-12 12:00					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	20	1	MPN/100 mL	2021-07-13	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G1379
2021-07-14 16:07

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G1401
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-13 12:05 / 8.6°C 2021-07-16 16:32
PO NUMBER	OK Falls WW	COC NUMBER	B099110
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

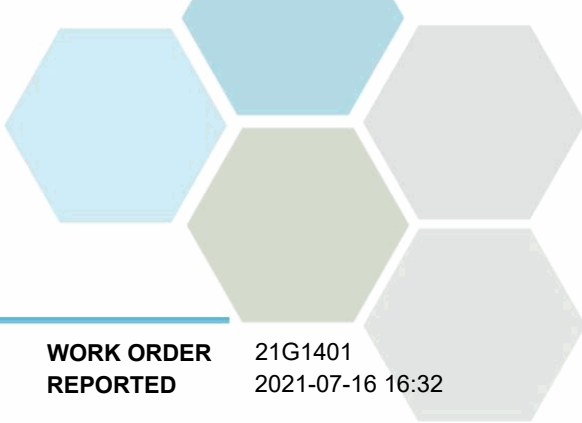
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

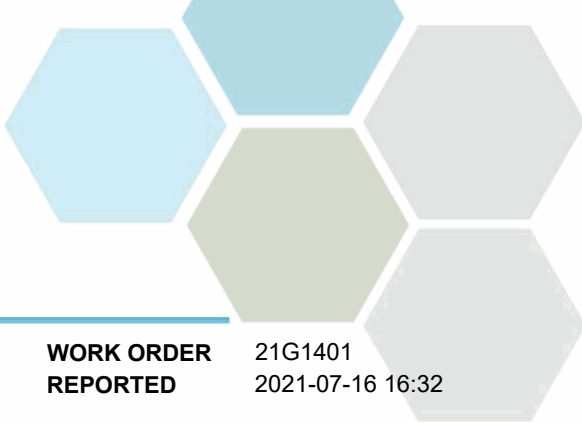


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G1401
2021-07-16 16:32

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21G1401-01) Matrix: Water Sampled: 2021-07-12 12:05					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0616	0.0050	mg/L	2021-07-16	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G1401
2021-07-16 16:32

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2727
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-22 12:30 / 10.7°C 2021-07-29 16:58
PO NUMBER	OK Falls WW	COC NUMBER	B095371
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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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.

Work Order Comments:

Custody Seals Intact: YES

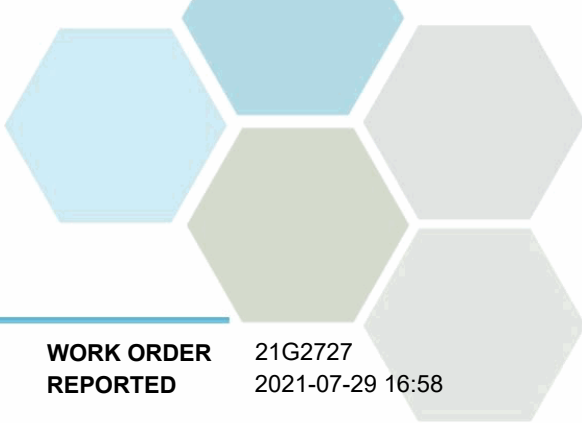
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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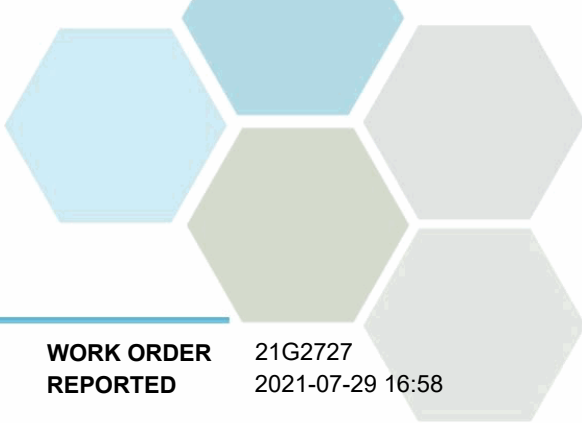


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G2727
2021-07-29 16:58

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP Wetland Outlet - Bacteria (21G2727-01) Matrix: Water Sampled: 2021-07-21 13:25					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	20	1	MPN/100 mL	2021-07-22	
OKFWWTP Wetland Outlet Rep 1 - Bacteria (21G2727-02) Matrix: Water Sampled: 2021-07-21 13:25					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	13	1	MPN/100 mL	2021-07-22	
OKFWWTP Wetland Outlet Rep 2 - Bacteria (21G2727-03) Matrix: Water Sampled: 2021-07-21 13:25					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	12	1	MPN/100 mL	2021-07-22	
NW Cross Ditch Sand Filter - Bacteria (21G2727-04) Matrix: Water Sampled: 2021-07-21 13:50					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	15	1	MPN/100 mL	2021-07-22	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G2727
2021-07-29 16:58

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2729
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-22 12:30 / 10.7°C 2021-07-29 16:59
PO NUMBER	OK Falls WW	COC NUMBER	B095371
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

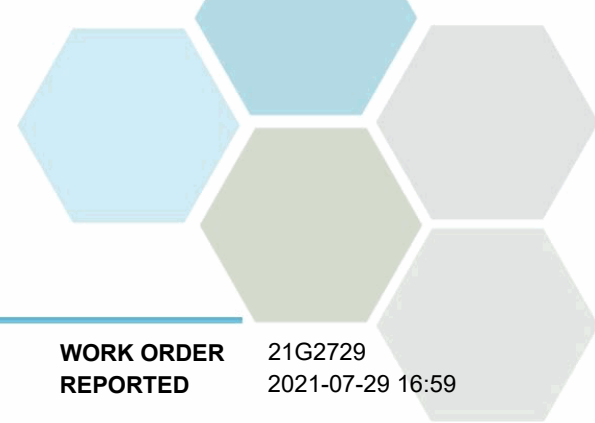
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G2729
2021-07-29 16:59

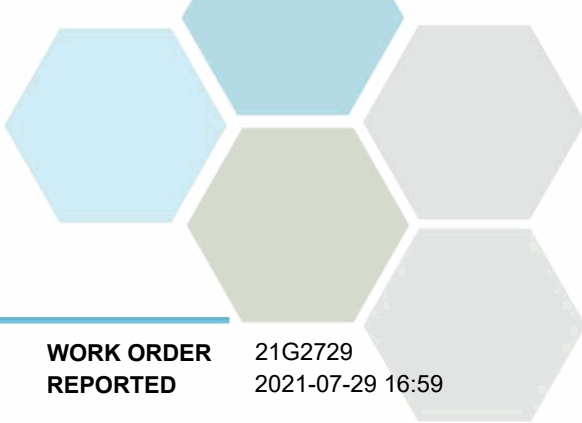
Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21G2729-01) Matrix: Water Sampled: 2021-07-21 13:25					
<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.776	0.0500	mg/L	N/A	
Nitrogen, Organic	0.701	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.075	0.050	mg/L	2021-07-26	
BOD, 5-day Carbonaceous	< 5.3	2.0	mg/L	2021-07-28	
Nitrogen, Total Kjeldahl	0.776	0.050	mg/L	2021-07-27	
pH	7.93	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0450	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-28	

OKFWWTP - Wetland Outlet Rep 1 (21G2729-02) | Matrix: Water | Sampled: 2021-07-21 13:25

<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.855	0.0500	mg/L	N/A	
Nitrogen, Organic	0.773	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.082	0.050	mg/L	2021-07-26	
BOD, 5-day Carbonaceous	< 5.3	2.0	mg/L	2021-07-28	
Nitrogen, Total Kjeldahl	0.855	0.050	mg/L	2021-07-27	
pH	7.93	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0597	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-28	

OKFWWTP - Wetland Outlet Rep 2 (21G2729-03) | Matrix: Water | Sampled: 2021-07-21 13:25

<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.739	0.0500	mg/L	N/A	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G2729
2021-07-29 16:59

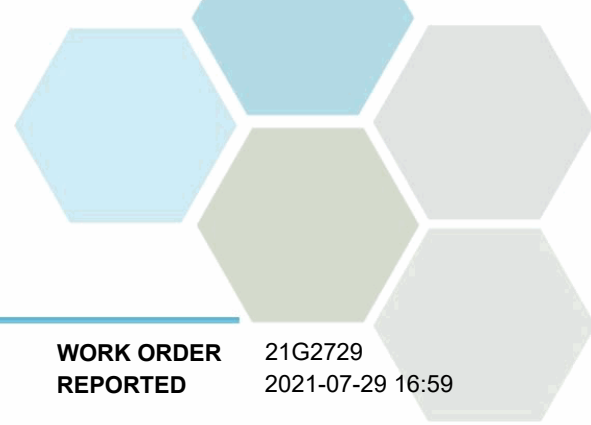
Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet Rep 2 (21G2729-03) Matrix: Water Sampled: 2021-07-21 13:25, Continued					
<i>Calculated Parameters, Continued</i>					
Nitrogen, Organic	0.655	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.084	0.050	mg/L	2021-07-26	
BOD, 5-day Carbonaceous	< 5.3	2.0	mg/L	2021-07-28	
Nitrogen, Total Kjeldahl	0.739	0.050	mg/L	2021-07-27	
pH	7.99	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0465	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-28	

NW Cross Ditch By Sand Filter (21G2729-04) | Matrix: Water | Sampled: 2021-07-21 13:50

<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.823	0.0500	mg/L	N/A	
Nitrogen, Organic	0.823	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-07-26	
BOD, 5-day Carbonaceous	< 5.3	2.0	mg/L	2021-07-28	
Nitrogen, Total Kjeldahl	0.823	0.050	mg/L	2021-07-27	
pH	8.01	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0462	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	2.4	2.0	mg/L	2021-07-28	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G2729
2021-07-29 16:59

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G3482
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-28 08:00 / 4.8°C
PO NUMBER	OK Falls WW	COC NUMBER	B095374
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

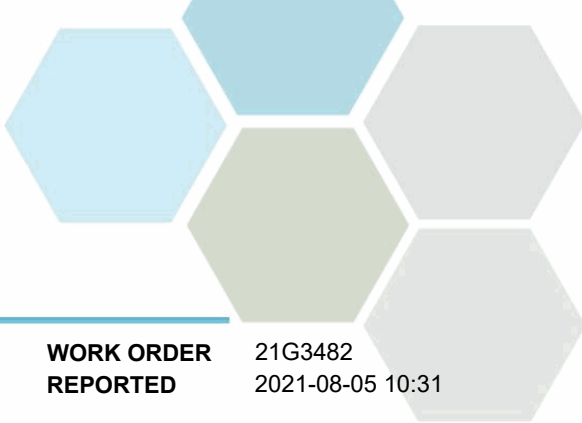
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

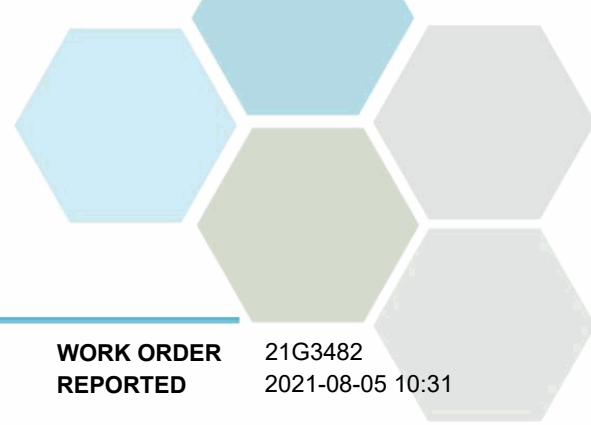
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G3482
2021-08-05 10:31

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21G3482-01) Matrix: Water Sampled: 2021-07-27 13:10					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0403	0.0050	mg/L	2021-08-04	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21G3482
2021-08-05 10:31

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCW

PROJECT INFO

WORK ORDER 21H0511

RECEIVED / TEMP 2021-08-05 13:57 / 8.9°C

REPORTED 2021-08-10 17:13

COC NUMBER B095375

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Work Order Comments:

Custody Seals Intact: YES

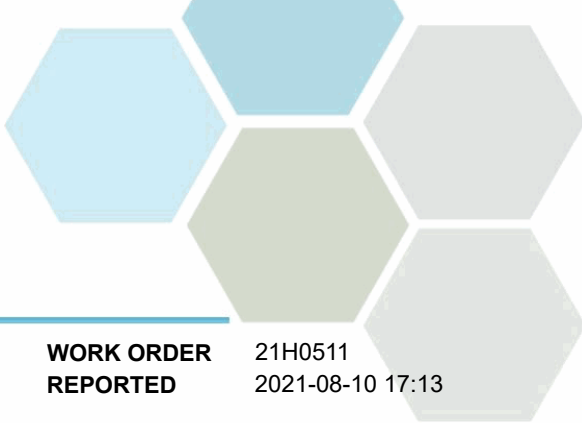
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Authorized By:

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Client Scientist - Team Lead

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TEST RESULTS

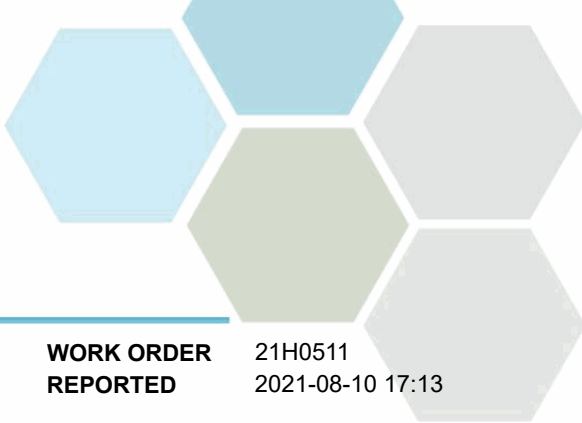
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H0511
2021-08-10 17:13

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21H0511-01) Matrix: Water Sampled: 2021-08-04 11:30					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0469	0.0050	mg/L	2021-08-10	
OKFWWTP - Wetland Outlet - Bacteria (21H0511-02) Matrix: Water Sampled: 2021-08-04 11:30					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	20	1	MPN/100 mL	2021-08-05	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H0511
2021-08-10 17:13

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCW

PROJECT INFO

WORK ORDER 21H1180

RECEIVED / TEMP 2021-08-11 13:00 / 10.0°C
REPORTED 2021-08-12 15:10

COC NUMBER B095376

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



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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.

Work Order Comments:

Custody Seals Intact: YES

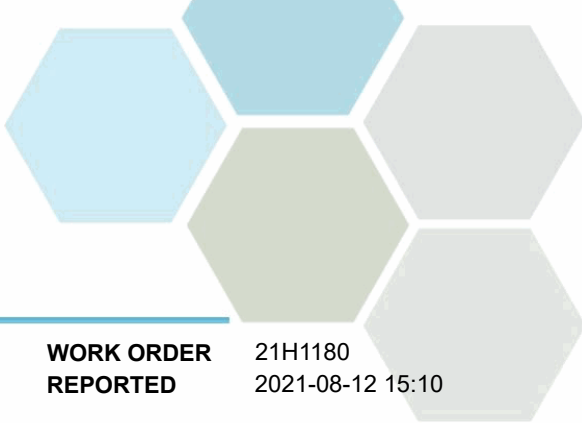
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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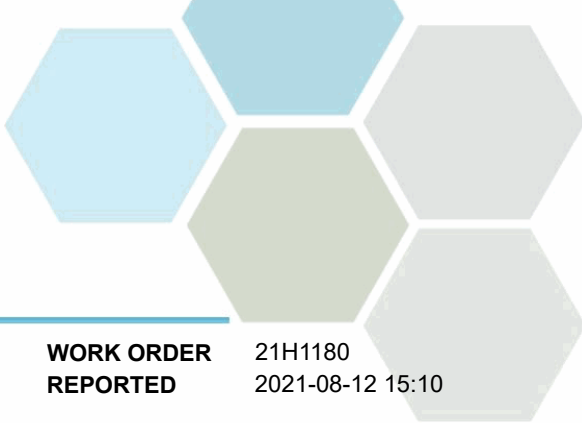


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H1180
2021-08-12 15:10

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21H1180-01) Matrix: Water Sampled: 2021-08-10 11:50					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	6	1	MPN/100 mL	2021-08-11	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H1180
2021-08-12 15:10

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H1188
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-11 13:00 / 10.0°C 2021-08-18 09:34
PO NUMBER	OK Falls WW	COC NUMBER	B095376
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

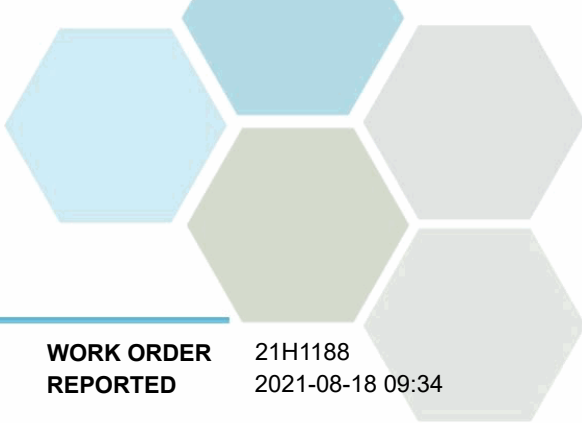
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

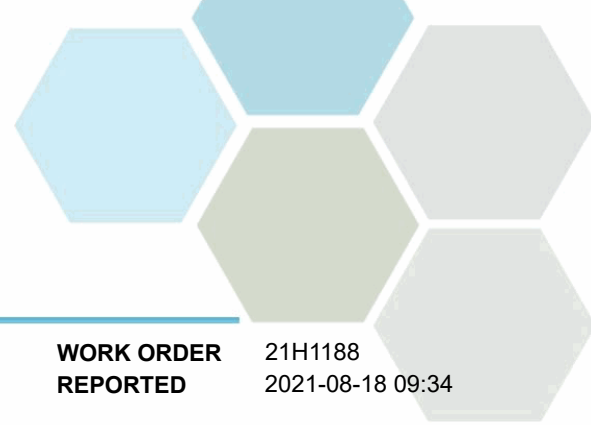
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H1188
2021-08-18 09:34

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21H1188-01) Matrix: Water Sampled: 2021-08-10 11:58					
<i>Anions</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-08-13	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-08-13	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.719	0.0500	mg/L	N/A	
Nitrogen, Organic	0.719	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-08-12	
BOD, 5-day Carbonaceous	< 5.3	2.0	mg/L	2021-08-17	
Nitrogen, Total Kjeldahl	0.719	0.050	mg/L	2021-08-17	
pH	7.92	0.10	pH units	2021-08-12	HT2
Phosphorus, Total (as P)	0.0384	0.0050	mg/L	2021-08-17	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-08-16	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H1188
2021-08-18 09:34

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H2291
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-19 13:30 / 5.0°C
PO NUMBER	OK Falls WW	REPORTED	2021-08-24 15:50
PROJECT	OK Falls WWTP MCW	COC NUMBER	B095377
PROJECT INFO			

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.

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Work Order Comments:

Custody Seals Intact: YES

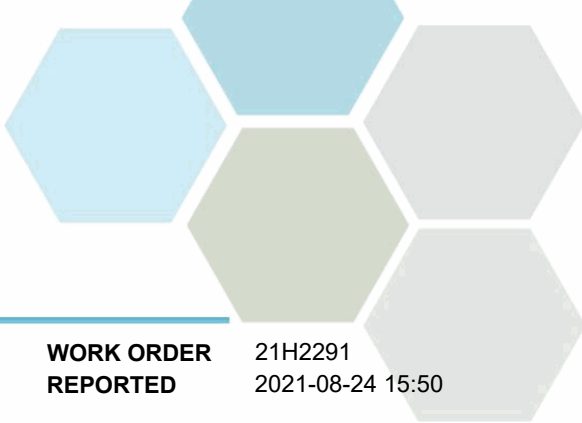
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

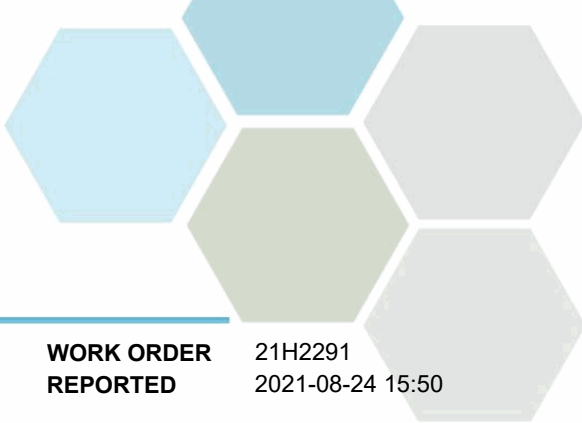
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H2291
2021-08-24 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21H2291-01) Matrix: Water Sampled: 2021-08-18 12:02					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0269	0.0050	mg/L	2021-08-24	PRES

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H2291
2021-08-24 15:50

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H3415
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-27 15:05 / 12.6°C
PO NUMBER	OK Falls WW	REPORTED	2021-08-30 13:15
PROJECT	OK Falls WWTP MCW	COC NUMBER	B095855
PROJECT INFO			

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.

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Work Order Comments:

Custody Seals Intact: N/A

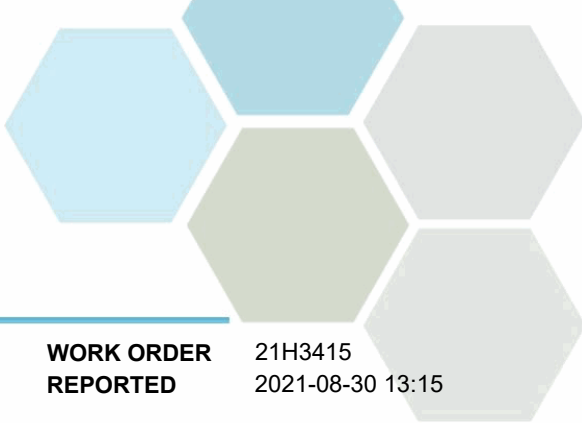
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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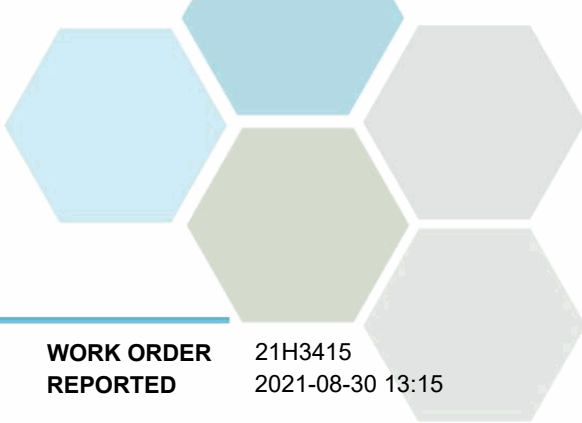


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H3415
2021-08-30 13:15

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21H3415-01) Matrix: Water Sampled: 2021-08-27 12:40					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	1410	1	MPN/100 mL	2021-08-27	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H3415
2021-08-30 13:15

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H3430
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-27 08:15 / 9.6°C
PO NUMBER	OK Falls WW	REPORTED	2021-08-31 16:15
PROJECT	OK Falls WWTP MCW	COC NUMBER	B095378
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

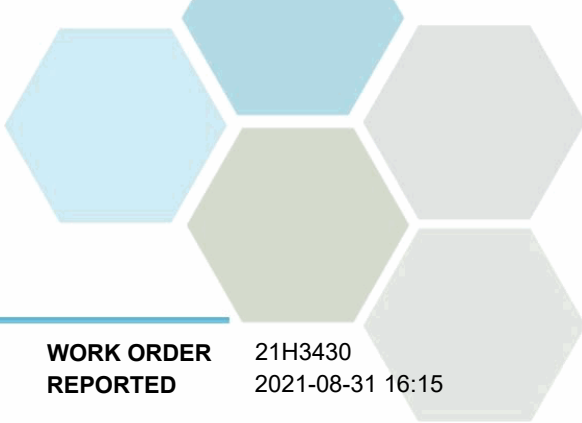
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

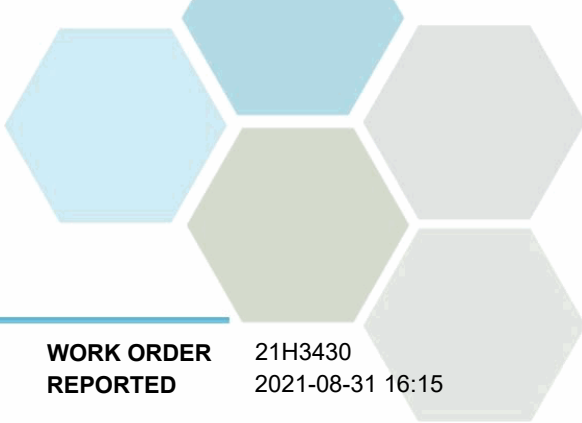
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H3430
2021-08-31 16:15

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21H3430-01) Matrix: Water Sampled: 2021-08-25 12:01					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0230	0.0050	mg/L	2021-08-31	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21H3430
2021-08-31 16:15

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCW

PROJECT INFO

WORK ORDER 2110158

RECEIVED / TEMP 2021-09-01 14:00 / 12.1°C
REPORTED 2021-09-02 17:47

COC NUMBER B095379

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.

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Work Order Comments:

Custody Seals Intact: YES

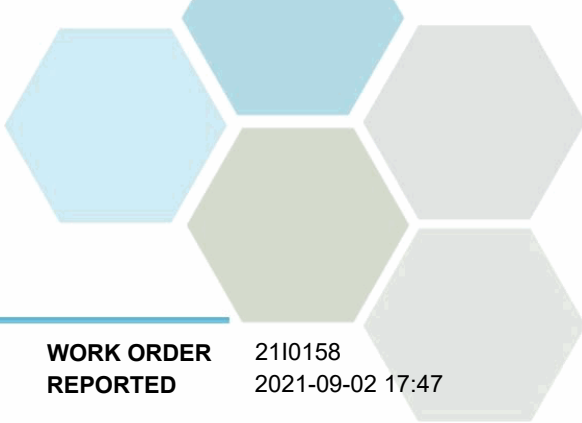
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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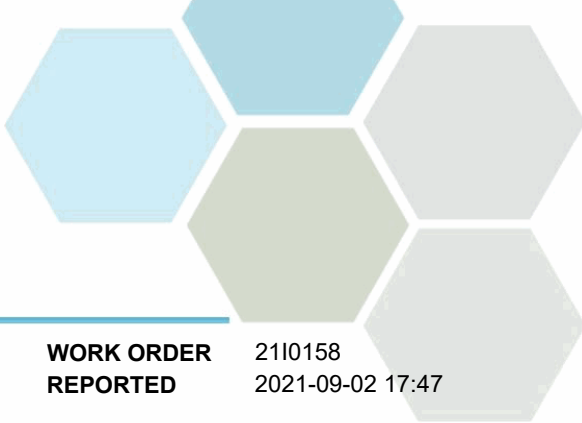


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2110158
2021-09-02 17:47

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (2110158-01) Matrix: Water Sampled: 2021-08-31 11:05					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	345	1	MPN/100 mL	2021-09-01	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2110158
2021-09-02 17:47

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2110161
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-01 14:00 / 12.1°C 2021-09-09 13:40
PO NUMBER	OK Falls WW	COC NUMBER	B095379
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

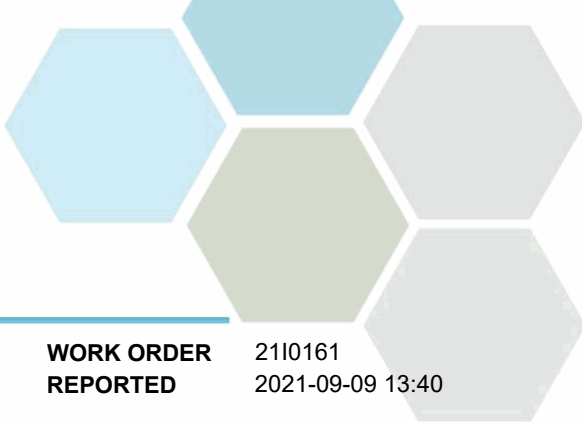
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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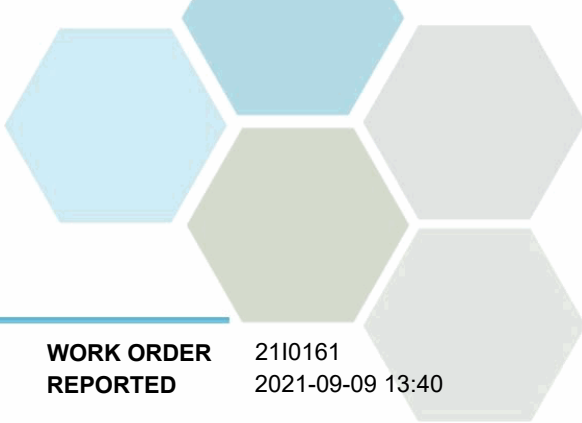


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2110161
2021-09-09 13:40

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (2110161-01) Matrix: Water Sampled: 2021-08-31 11:05					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0366	0.0050	mg/L	2021-09-03	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2110161
2021-09-09 13:40

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCW

PROJECT INFO

WORK ORDER 2111004

RECEIVED / TEMP 2021-09-08 12:35 / 7.3°C

REPORTED 2021-09-10 16:29

COC NUMBER B095380

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.

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Work Order Comments:

Custody Seals Intact: YES

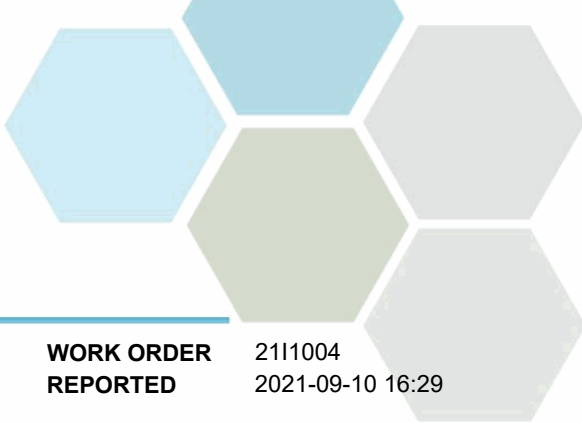
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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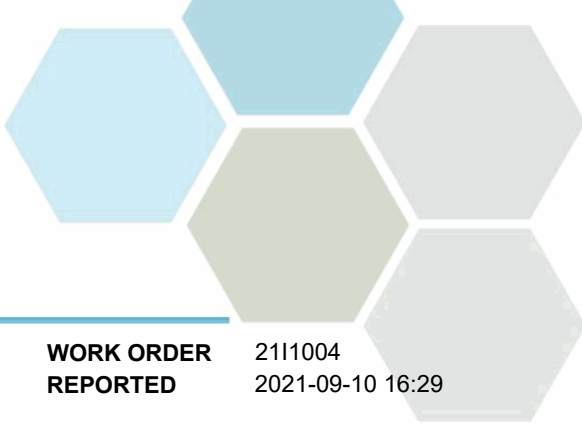


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2111004
2021-09-10 16:29

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (2111004-01) Matrix: Water Sampled: 2021-09-07 12:05					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-09-08	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2111004
2021-09-10 16:29

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2111027
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-08 12:35 / 7.3°C 2021-09-13 16:05
PO NUMBER	OK Falls WW	COC NUMBER	B095380
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

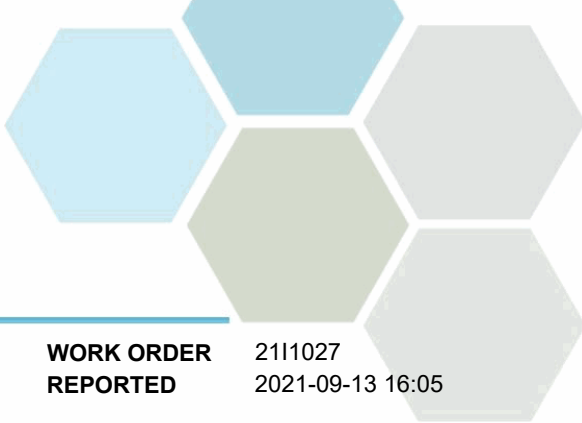
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2111027
2021-09-13 16:05

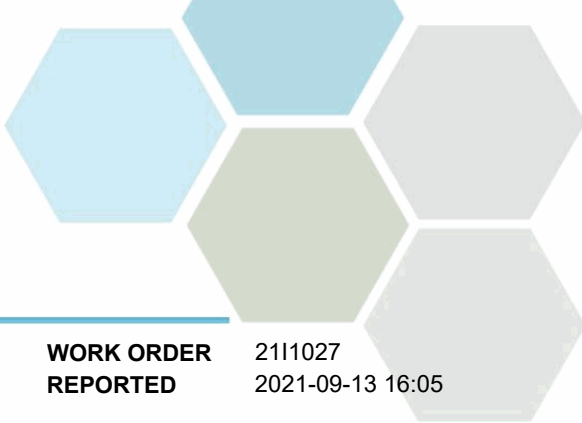
Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (2111027-01) Matrix: Water Sampled: 2021-09-07 12:05					PRES

General Parameters

Phosphorus, Total (as P)	0.0298	0.0050	mg/L	2021-09-13	
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Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2111027
2021-09-13 16:05

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2111690
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-14 11:55 / 7.8°C 2021-09-15 15:11
PO NUMBER	OK Falls WW	COC NUMBER	B095381
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

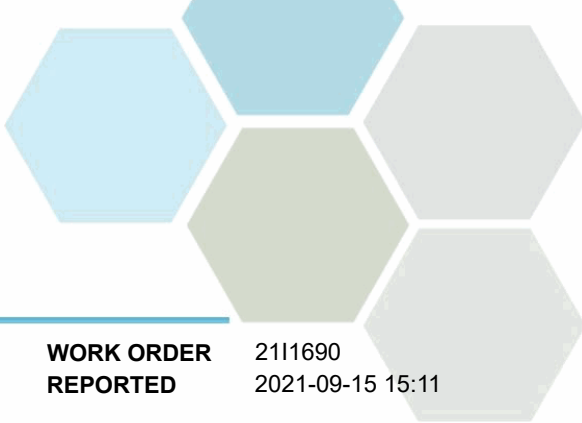
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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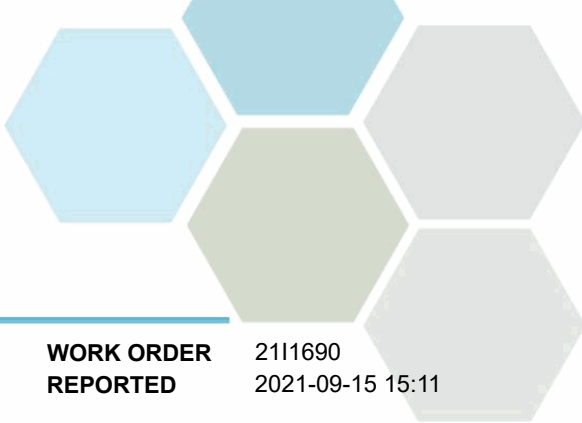


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2111690
2021-09-15 15:11

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (2111690-01) Matrix: Water Sampled: 2021-09-13 11:20					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	248	1	MPN/100 mL	2021-09-14	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2111690
2021-09-15 15:11

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2111692
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-14 11:55 / 7.8°C 2021-09-17 15:06
PO NUMBER	OK Falls WW	COC NUMBER	B095381
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

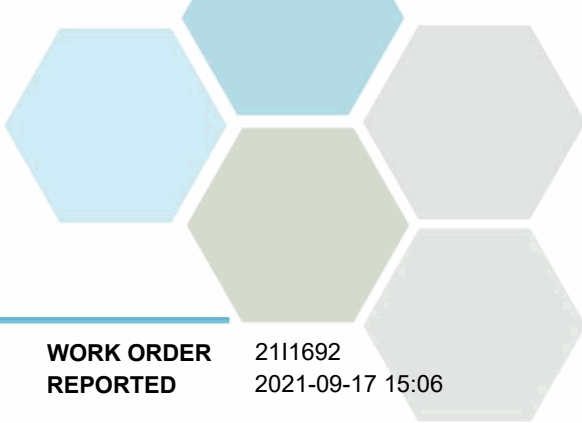
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

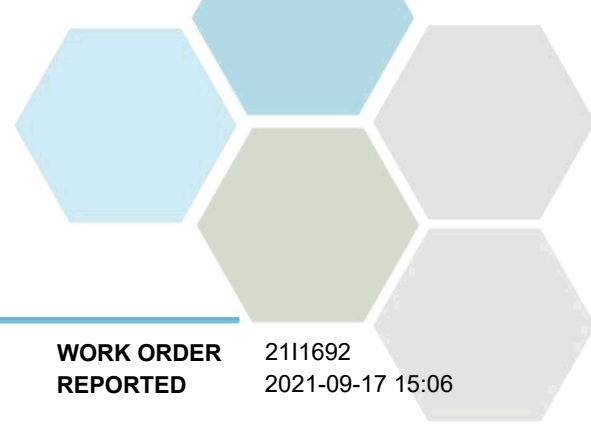
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2111692
2021-09-17 15:06

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (2111692-01) Matrix: Water Sampled: 2021-09-13 11:20					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0371	0.0050	mg/L	2021-09-17	

Sample Qualifiers:

PRES Sample has been preserved for tp in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2111692
2021-09-17 15:06

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MCW

PROJECT INFO

WORK ORDER 2112979

RECEIVED / TEMP 2021-09-22 12:30 / 8.6°C

REPORTED 2021-09-24 14:39

COC NUMBER B095385

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

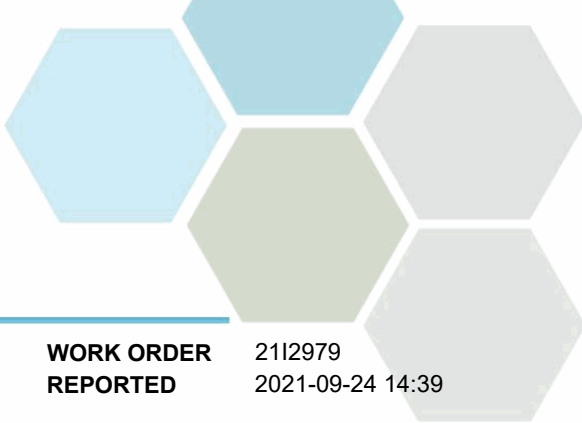
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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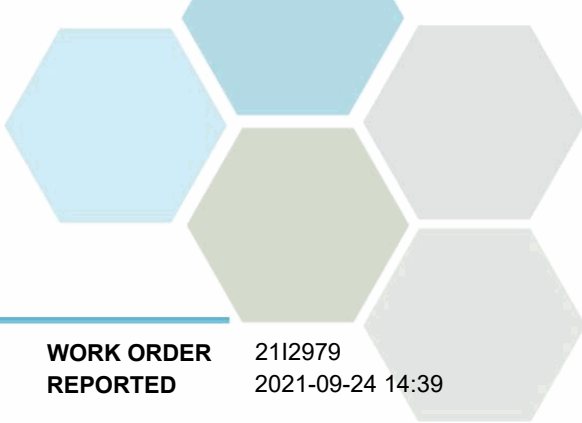


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2112979
2021-09-24 14:39

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (2112979-01) Matrix: Water Sampled: 2021-09-21 11:55					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	162	1	MPN/100 mL	2021-09-22	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2112979
2021-09-24 14:39

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2112980
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-22 12:30 / 8.6°C
PO NUMBER	OK Falls WW	COC NUMBER	B095385
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

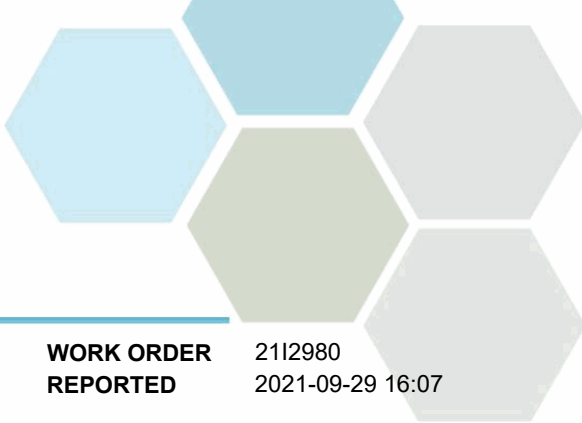
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TEST RESULTS

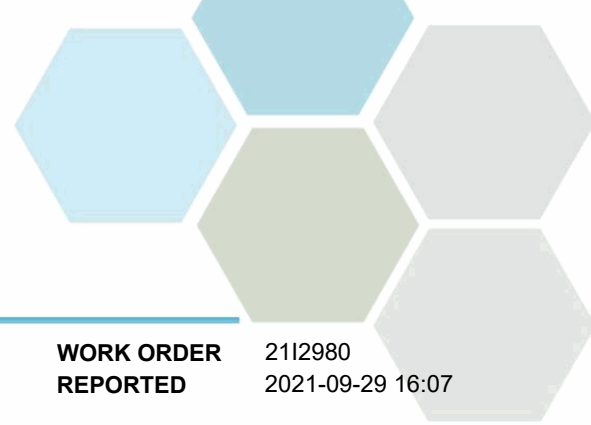
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2112980
2021-09-29 16:07

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (2112980-01) Matrix: Water Sampled: 2021-09-21 11:55					
<i>Anions</i>					
Nitrate (as N)	0.029	0.010	mg/L	2021-09-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-09-23	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	0.0286	0.0100	mg/L	N/A	
Nitrogen, Total	0.893	0.0500	mg/L	N/A	
Nitrogen, Organic	0.814	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	0.050	0.050	mg/L	2021-09-24	
BOD, 5-day Carbonaceous	< 7.4	2.0	mg/L	2021-09-28	
Nitrogen, Total Kjeldahl	0.864	0.050	mg/L	2021-09-29	
pH	7.83	0.10	pH units	2021-09-27	HT2
Phosphorus, Total (as P)	0.0319	0.0050	mg/L	2021-09-28	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-28	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2112980
2021-09-29 16:07

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2113943
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-29 12:00 / 10.1°C
PO NUMBER	OK Falls WW	COC NUMBER	B095389
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

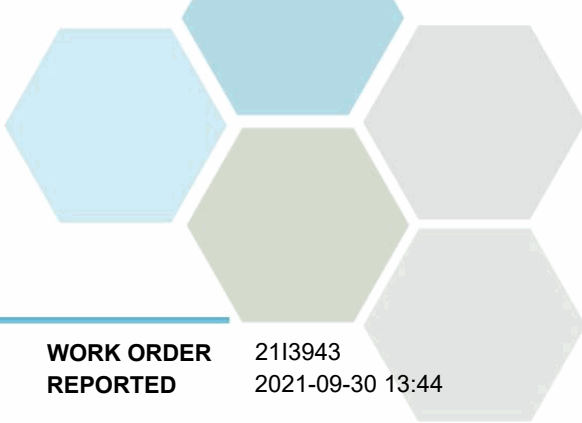
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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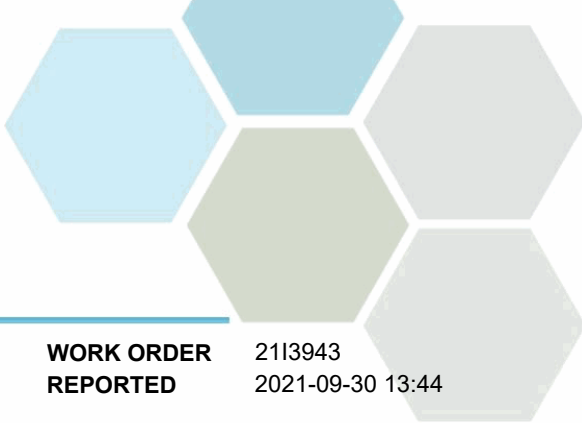


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2113943
2021-09-30 13:44

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (2113943-01) Matrix: Water Sampled: 2021-09-28 10:50					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	67	1	MPN/100 mL	2021-09-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2113943
2021-09-30 13:44

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2113945
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-29 12:00 / 10.1°C
PO NUMBER	OK Falls WW	COC NUMBER	2021-10-06 16:31 B095389
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

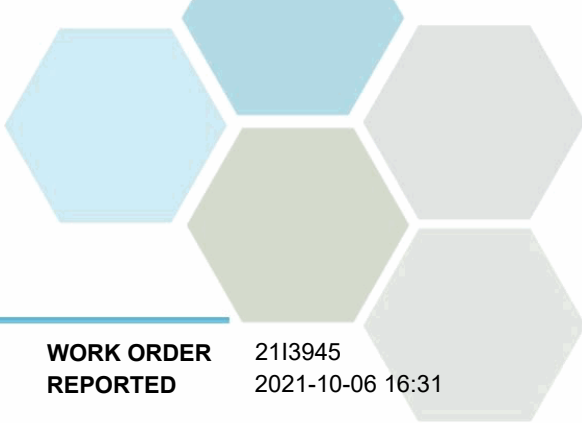
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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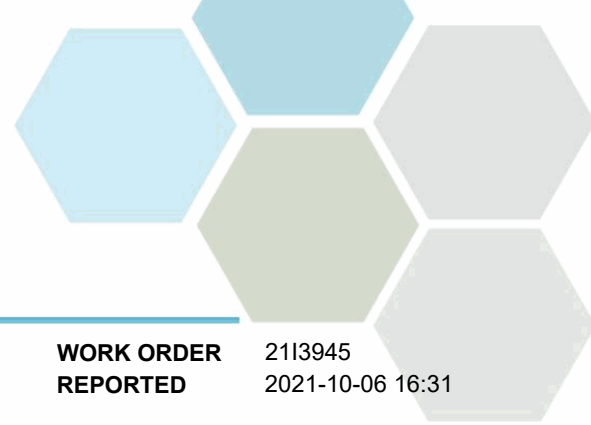


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2113945
2021-10-06 16:31

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (2113945-01) Matrix: Water Sampled: 2021-09-28 10:50					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0343	0.0050	mg/L	2021-10-06	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 2113945
2021-10-06 16:31

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J0507
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-05 12:40 / 4.8°C 2021-10-08 17:33
PO NUMBER	OK Falls WW	COC NUMBER	B095386
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

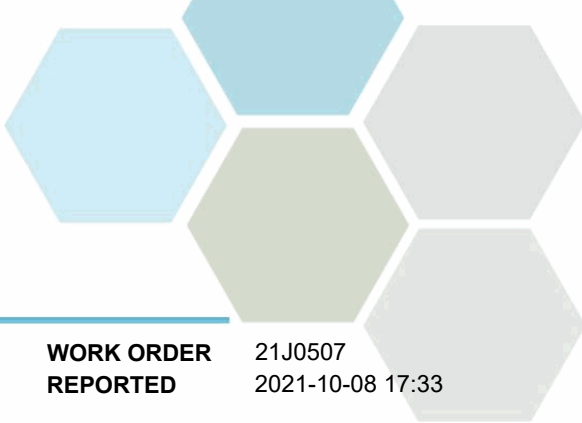
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Authorized By:

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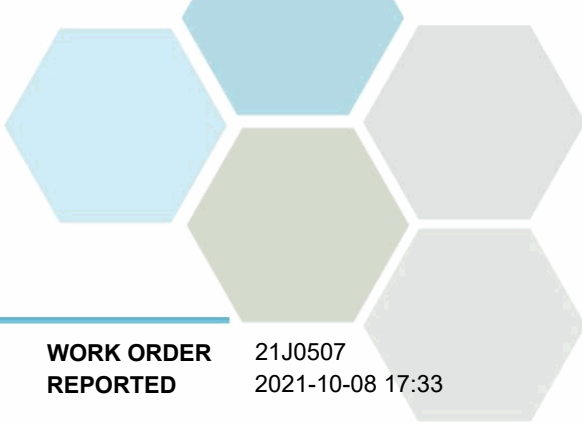


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J0507
2021-10-08 17:33

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21J0507-01) Matrix: Water Sampled: 2021-10-04 11:10					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	22	1	MPN/100 mL	2021-10-05	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J0507
2021-10-08 17:33

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J0508
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-05 12:40 / 4.8°C 2021-10-13 15:31
PO NUMBER	OK Falls WW	COC NUMBER	B095386
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

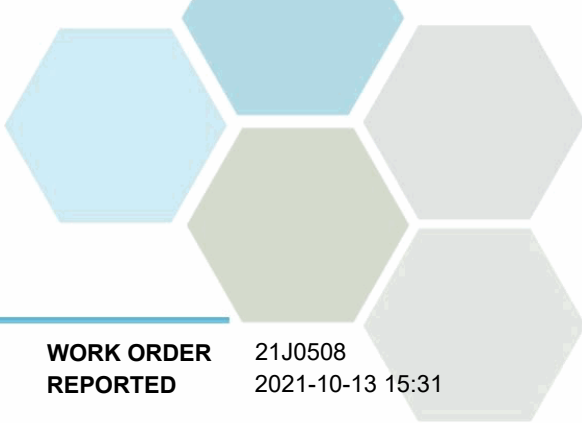
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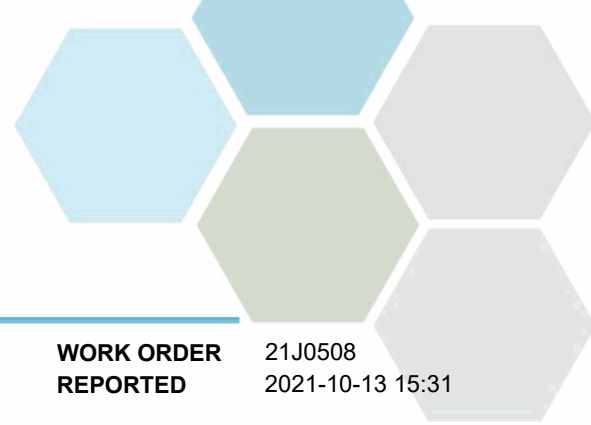


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J0508
2021-10-13 15:31

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21J0508-01) Matrix: Water Sampled: 2021-10-04 11:10					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0316	0.0050	mg/L	2021-10-12	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J0508
2021-10-13 15:31

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J1852
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-14 12:01 / 6.1°C 2021-10-18 14:33
PO NUMBER	OK Falls WW	COC NUMBER	B095388
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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Work Order Comments:

Custody Seals Intact: YES

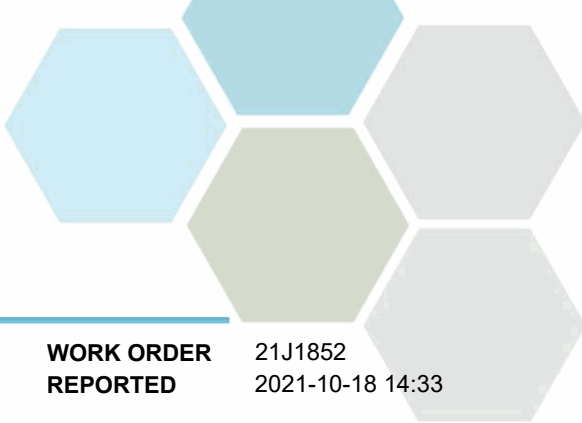
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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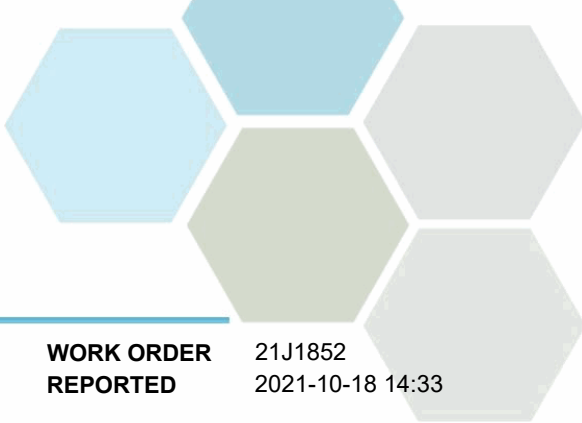


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J1852
2021-10-18 14:33

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21J1852-01) Matrix: Water Sampled: 2021-10-13 12:43					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	96	1	MPN/100 mL	2021-10-14	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J1852
2021-10-18 14:33

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J1856
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-14 12:01 / 6.1°C 2021-10-22 15:40
PO NUMBER	OK Falls WW	COC NUMBER	B095388
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

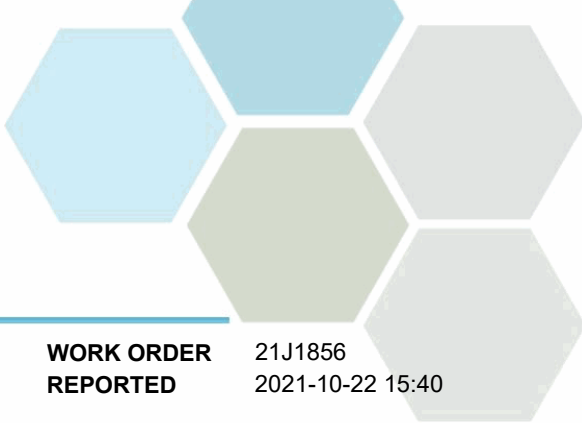
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

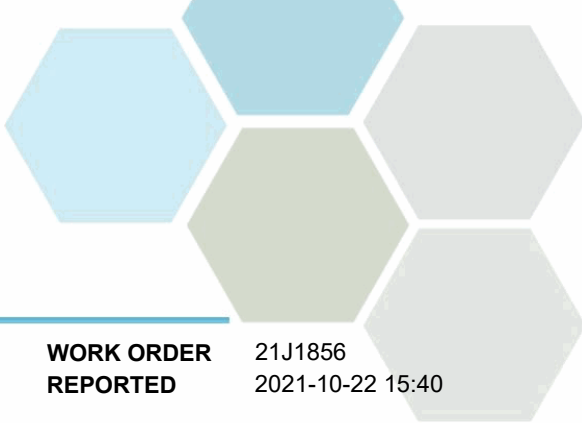
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J1856
2021-10-22 15:40

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21J1856-01) Matrix: Water Sampled: 2021-10-13 12:43					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0245	0.0050	mg/L	2021-10-22	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J1856
2021-10-22 15:40

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J2676
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-20 12:30 / 11.1°C 2021-10-26 09:23
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP QCE		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

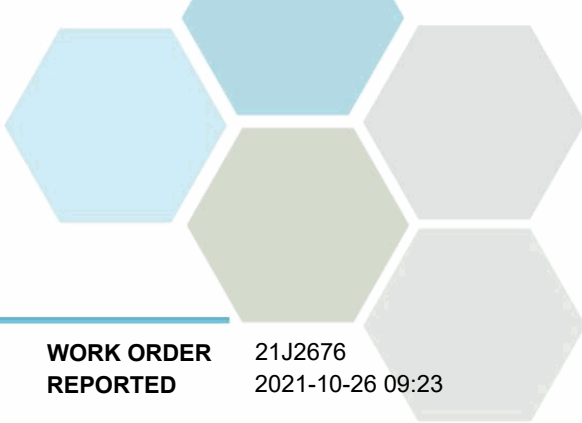
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Authorized By:

Brent Whitehead
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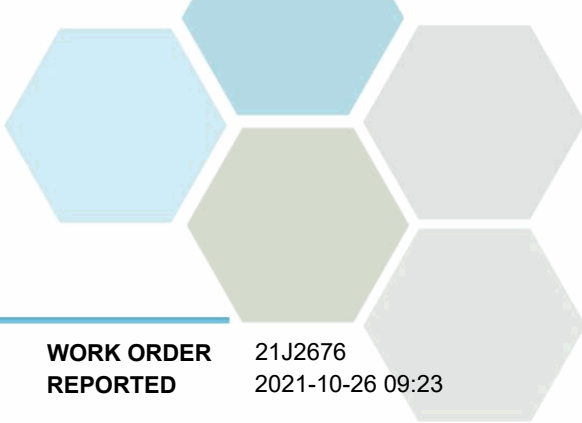


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2676
2021-10-26 09:23

Analyte	Result	RL	Units	Analyzed	Qualifier
Wetland Outlet - Bacteria (21J2676-01) Matrix: Water Sampled: 2021-10-19 11:20					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	23	1	MPN/100 mL	2021-10-20	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2676
2021-10-26 09:23

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QCE

PROJECT INFO

WORK ORDER 21J2678

RECEIVED / TEMP 2021-10-20 12:30 / 11.1°C

REPORTED 2021-10-28 15:50

COC NUMBER No Number

Introduction:

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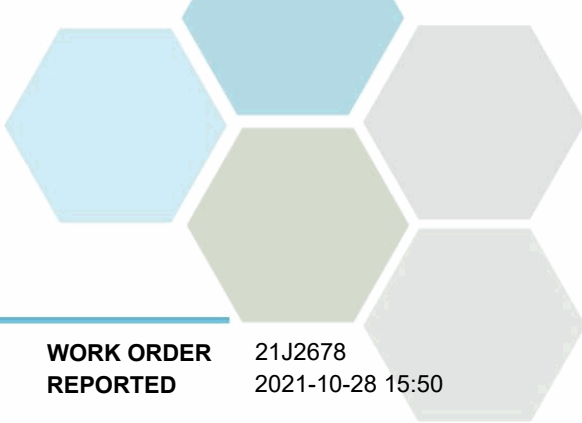
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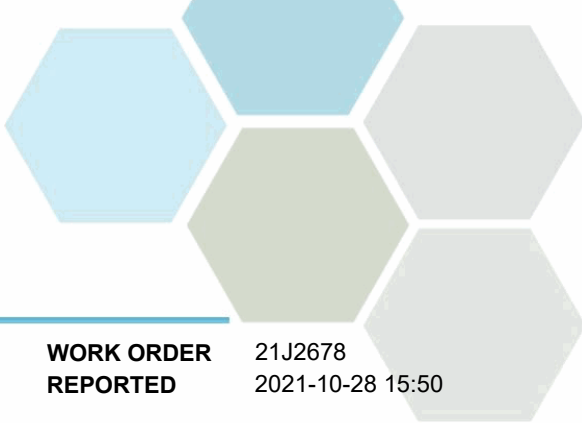


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2678
2021-10-28 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Wetland Outlet (21J2678-01) Matrix: Water Sampled: 2021-10-19 11:20					FILT, PRES
Anions					
Chloride	138	0.10	mg/L	2021-10-24	
Fluoride	0.20	0.10	mg/L	2021-10-24	
Nitrate (as N)	0.212	0.010	mg/L	2021-10-24	HT1
Nitrite (as N)	< 0.010	0.010	mg/L	2021-10-24	HT1
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-10-24	HT1
Sulfate	49.2	1.0	mg/L	2021-10-24	
Calculated Parameters					
Hardness, Total (as CaCO3)	247	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	0.212	0.0100	mg/L	N/A	
Nitrogen, Total	0.823	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	269	1.0	mg/L	2021-10-21	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-10-21	
Alkalinity, Bicarbonate (as CaCO3)	269	1.0	mg/L	2021-10-21	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-10-21	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-10-21	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-10-25	
BOD, 5-day	< 1.0	2.0	mg/L	2021-10-26	
BOD, 5-day Carbonaceous	< 1.0	2.0	mg/L	2021-10-26	
Chemical Oxygen Demand	< 20	20	mg/L	2021-10-24	
Conductivity (EC)	985	2.0	µS/cm	2021-10-21	
Nitrogen, Total Kjeldahl	0.611	0.050	mg/L	2021-10-24	
pH	7.94	0.10	pH units	2021-10-21	HT2
Phosphorus, Total (as P)	0.0260	0.0050	mg/L	2021-10-28	
Phosphorus, Total Dissolved	0.0236	0.0050	mg/L	2021-10-28	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-10-26	
UV Transmittance @ 254nm	69.6	0.10	% T	2021-10-21	
Total Metals					
Aluminum, total	0.0288	0.0050	mg/L	2021-10-26	
Antimony, total	0.00141	0.00020	mg/L	2021-10-26	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-10-26	
Barium, total	0.0670	0.0050	mg/L	2021-10-26	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-10-26	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-10-26	
Boron, total	0.211	0.0500	mg/L	2021-10-26	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-10-26	
Calcium, total	75.4	0.20	mg/L	2021-10-26	
Chromium, total	0.00115	0.00050	mg/L	2021-10-26	
Cobalt, total	0.00015	0.00010	mg/L	2021-10-26	
Copper, total	0.0146	0.00040	mg/L	2021-10-26	
Iron, total	0.127	0.010	mg/L	2021-10-26	



TEST RESULTS

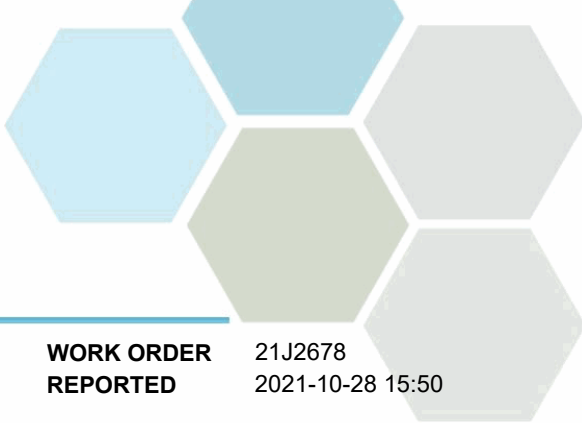
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2678
2021-10-28 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Wetland Outlet (21J2678-01) Matrix: Water Sampled: 2021-10-19 11:20, Continued					FILT, PRES
<i>Total Metals, Continued</i>					
Lead, total	< 0.00020	0.00020	mg/L	2021-10-26	
Lithium, total	0.00687	0.00010	mg/L	2021-10-26	
Magnesium, total	14.1	0.010	mg/L	2021-10-26	
Manganese, total	0.00376	0.00020	mg/L	2021-10-26	
Mercury, total	< 0.000010	0.000010	mg/L	2021-10-27	
Molybdenum, total	0.00805	0.00010	mg/L	2021-10-26	
Nickel, total	0.00197	0.00040	mg/L	2021-10-26	
Phosphorus, total	0.057	0.050	mg/L	2021-10-26	
Potassium, total	20.3	0.10	mg/L	2021-10-26	
Selenium, total	< 0.00050	0.00050	mg/L	2021-10-26	
Silicon, total	7.7	1.0	mg/L	2021-10-26	
Silver, total	< 0.000050	0.000050	mg/L	2021-10-26	
Sodium, total	104	0.10	mg/L	2021-10-26	
Strontium, total	0.586	0.0010	mg/L	2021-10-26	
Sulfur, total	14.4	3.0	mg/L	2021-10-26	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-10-26	
Thallium, total	< 0.000020	0.000020	mg/L	2021-10-26	
Thorium, total	< 0.00010	0.00010	mg/L	2021-10-26	
Tin, total	0.00054	0.00020	mg/L	2021-10-26	
Titanium, total	< 0.0050	0.0050	mg/L	2021-10-26	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-10-26	
Uranium, total	0.00423	0.000020	mg/L	2021-10-26	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-10-26	
Zinc, total	0.0533	0.0040	mg/L	2021-10-26	
Zirconium, total	0.00016	0.00010	mg/L	2021-10-26	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- 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.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

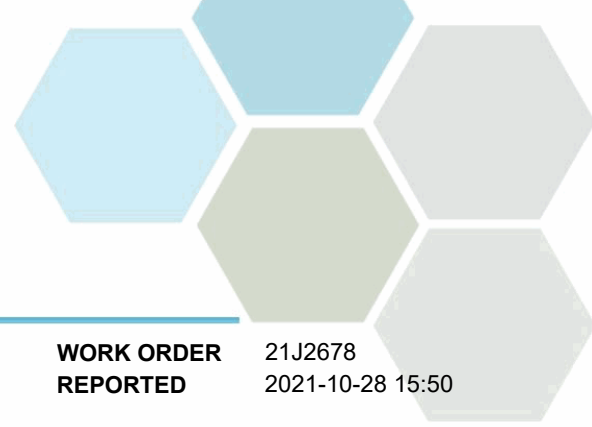
WORK ORDER REPORTED 21J2678
2021-10-28 15:50

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Transmittance at 254 nm in Water	SM 5910 B* (2017)	Ultraviolet Absorption	✓	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)
% T	Percent Transmittance
<	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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QCE

WORK ORDER REPORTED 21J2678
2021-10-28 15:50

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. The quality control (QC) data is available upon request

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J3503
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-26 12:10 / 4.0°C 2021-10-28 11:06
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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



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Work Order Comments:

Custody Seals Intact: N/A

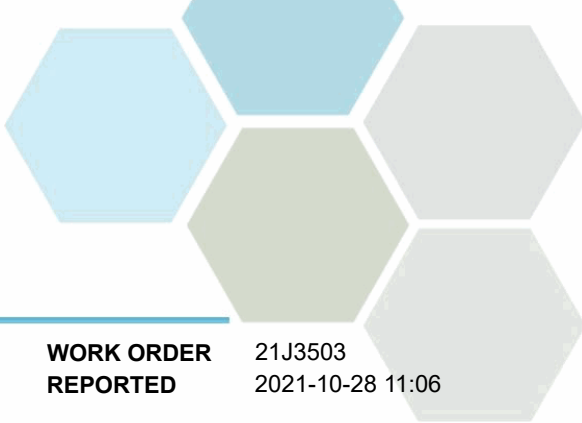
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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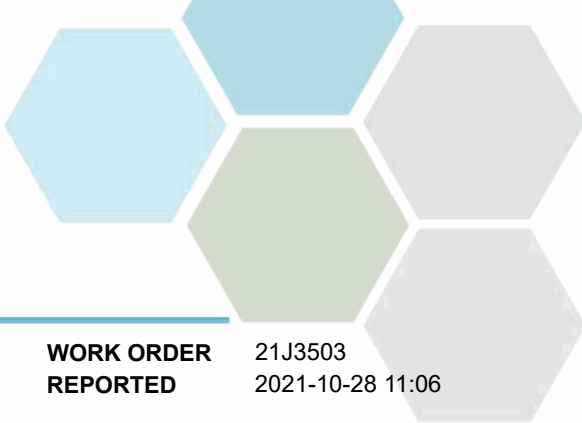


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J3503
2021-10-28 11:06

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP Wetland Outlet - Bacteria (21J3503-01) Matrix: Water Sampled: 2021-10-25 11:40					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	19	1	MPN/100 mL	2021-10-26	
NW Cross Ditch Sand Filter - Bacteria (21J3503-02) Matrix: Water Sampled: 2021-10-25 11:44					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	120	1	MPN/100 mL	2021-10-26	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J3503
2021-10-28 11:06

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J4077
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-26 12:10 / 4.0°C
PO NUMBER	OK Falls WW	COC NUMBER	BXXXXX
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

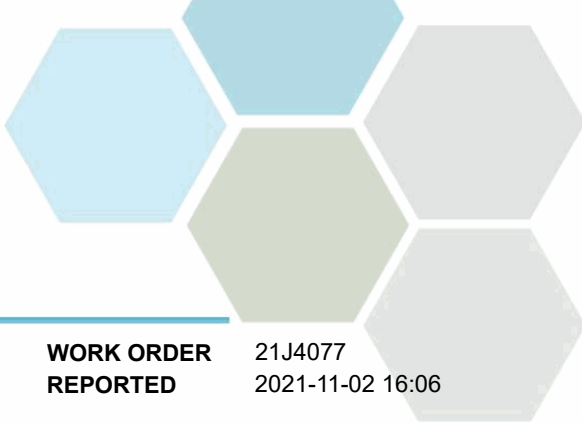
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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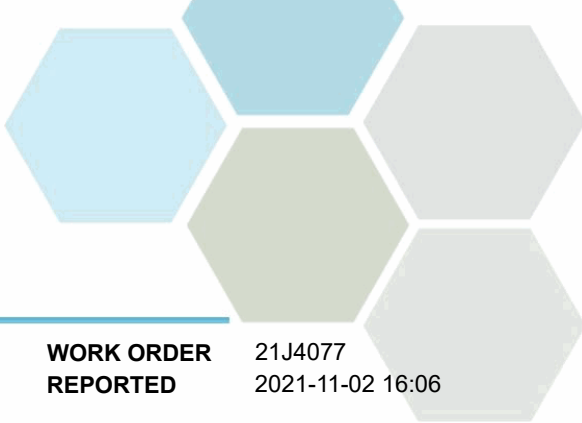


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J4077
2021-11-02 16:06

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21J4077-01) Matrix: Water Sampled: 2021-10-25 11:40					
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0351	0.0050	mg/L	2021-11-02	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21J4077
2021-11-02 16:06

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K0189
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-02 11:40 / 6.1°C 2021-11-08 16:15
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

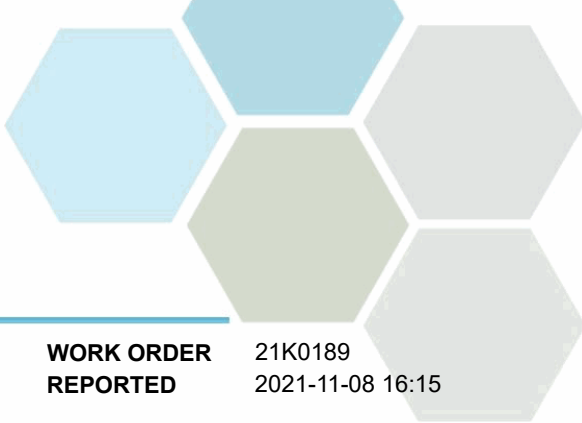
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

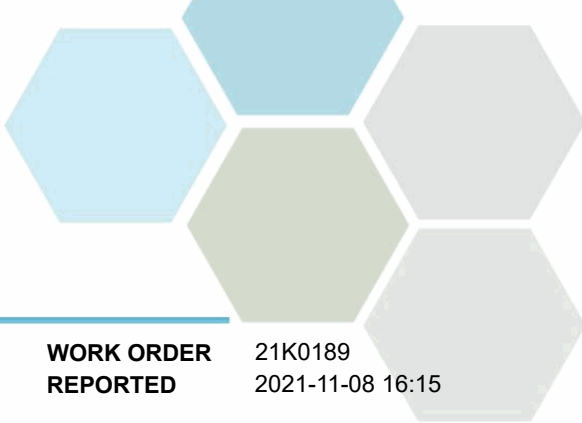
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K0189
2021-11-08 16:15

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21K0189-01) Matrix: Water Sampled: 2021-11-01 12:10					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0282	0.0050	mg/L	2021-11-08	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K0189
2021-11-08 16:15

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K0195
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-02 11:40 / 6.1°C 2021-11-05 13:04
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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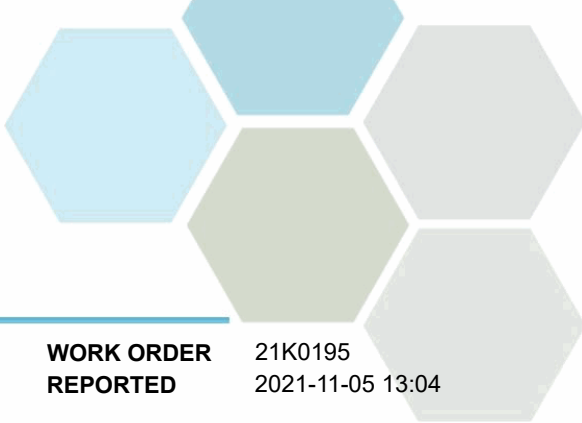
<i>Big Picture Sidekicks</i>		<i>We've Got Chemistry</i>		<i>Ahead of the Curve</i>	
You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.		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.		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.	

Work Order Comments: Custody Seals Intact: N/A

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

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

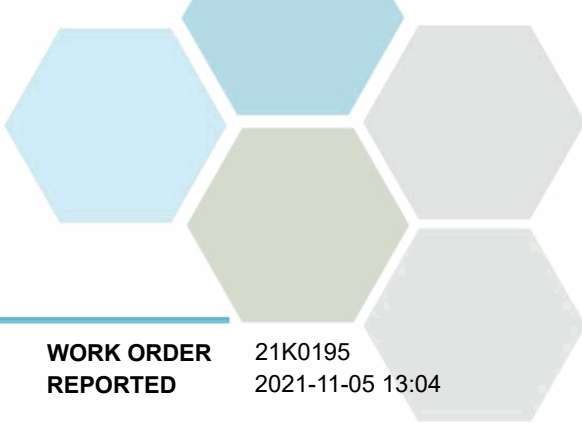


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K0195
2021-11-05 13:04

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21K0195-01) Matrix: Water Sampled: 2021-11-01 12:10					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-11-02	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K0195
2021-11-05 13:04

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
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General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K1273
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-09 12:00 / 4.1°C 2021-11-10 16:43
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

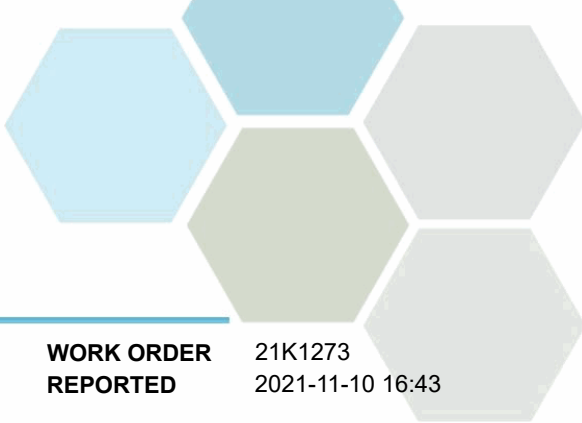
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K1273
2021-11-10 16:43

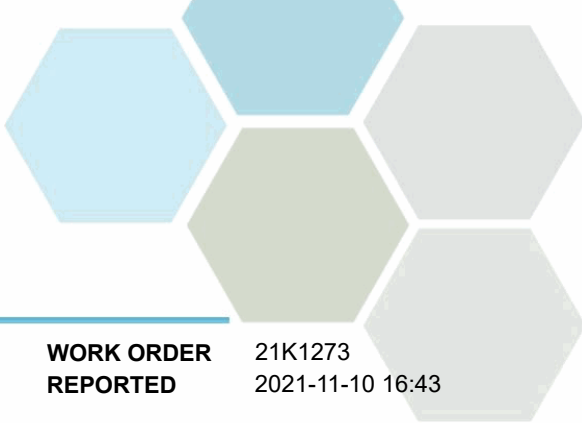
Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21K1273-01) Matrix: Water Sampled: 2021-11-08 11:45					PRES

General Parameters

Phosphorus, Total (as P)	0.0310	0.0050	mg/L	2021-11-10	
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Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K1273
2021-11-10 16:43

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K1274
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-09 12:00 / 4.1°C 2021-11-12 15:24
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

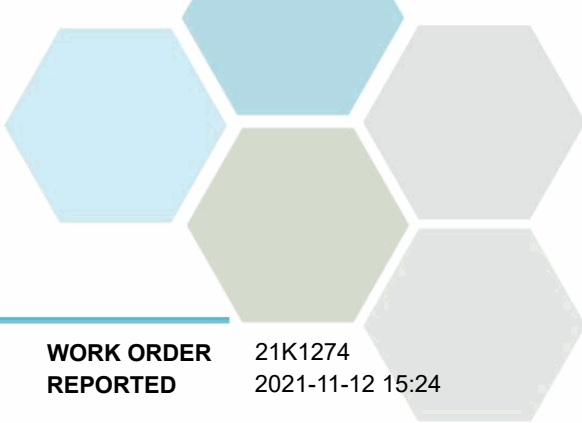
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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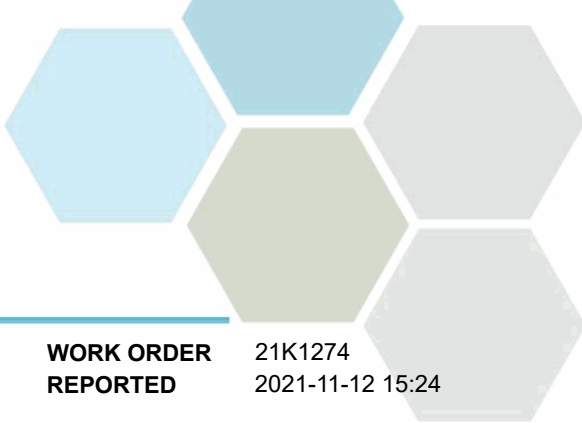


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K1274
2021-11-12 15:24

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21K1274-01) Matrix: Water Sampled: 2021-11-08 11:45					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-11-09	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K1274
2021-11-12 15:24

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K2416
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-18 11:20 / 10.5°C 2021-11-22 12:55
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

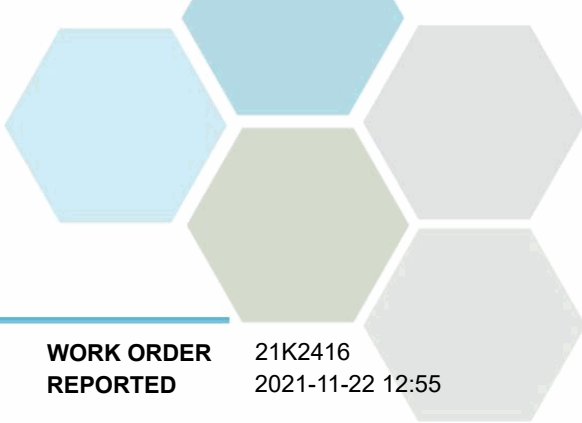
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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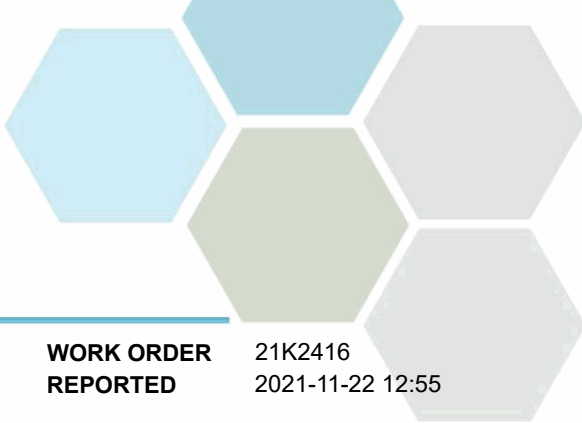


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K2416
2021-11-22 12:55

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21K2416-01) Matrix: Water Sampled: 2021-11-17 11:30					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	3	1	MPN/100 mL	2021-11-18	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K2416
2021-11-22 12:55

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K2417
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-18 11:20 / 10.5°C 2021-11-24 15:07
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: N/A

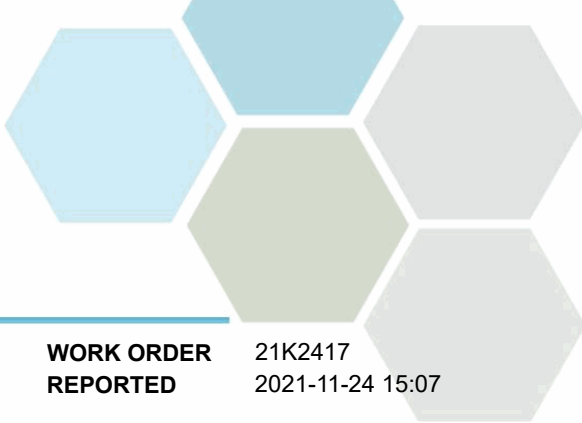
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Authorized By:

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TEST RESULTS

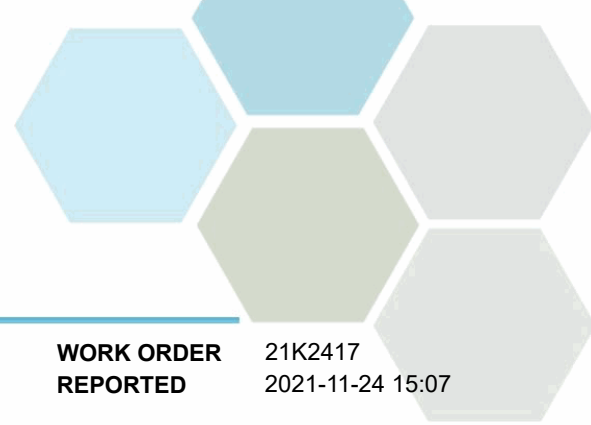
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K2417
2021-11-24 15:07

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21K2417-01) Matrix: Water Sampled: 2021-11-17 11:30					
<i>Anions</i>					
Nitrate (as N)	0.171	0.010	mg/L	2021-11-18	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-11-18	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	0.171	0.0100	mg/L	N/A	
Nitrogen, Total	0.813	0.0500	mg/L	N/A	
Nitrogen, Organic	0.642	0.0500	mg/L	N/A	
<i>General Parameters</i>					
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-11-19	
BOD, 5-day Carbonaceous	7.1	2.0	mg/L	2021-11-23	
Nitrogen, Total Kjeldahl	0.642	0.050	mg/L	2021-11-23	
pH	7.97	0.10	pH units	2021-11-20	HT2
Phosphorus, Total (as P)	0.0241	0.0050	mg/L	2021-11-22	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-23	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K2417
2021-11-24 15:07

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	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
pH units	pH < 7 = acidic, pH > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K2911
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-23 13:05 / 4.6°C 2021-11-26 10:35
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

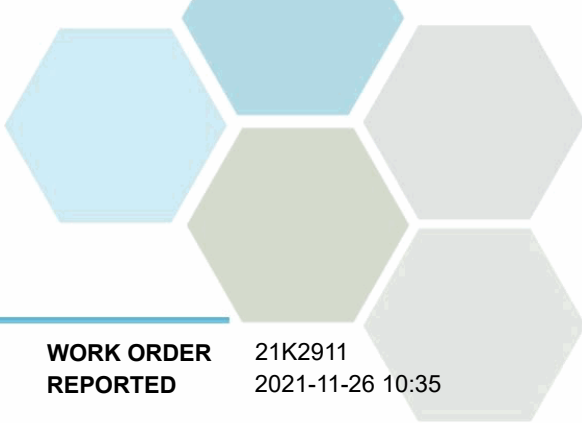
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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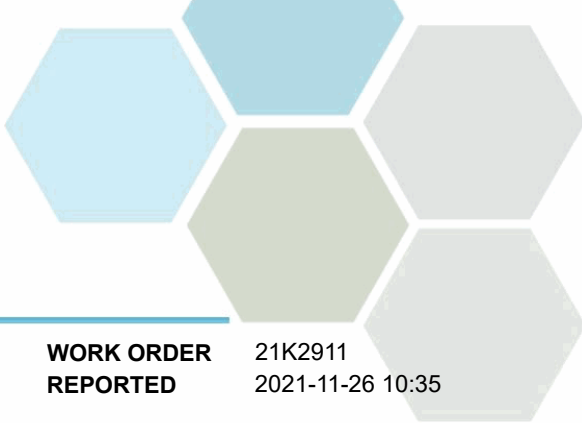


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K2911
2021-11-26 10:35

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21K2911-01) Matrix: Water Sampled: 2021-11-22 13:15					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	2	1	MPN/100 mL	2021-11-23	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K2911
2021-11-26 10:35

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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MPN/100 mL	Most Probable Number per 100 millilitres
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K2912
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-23 13:05 / 4.6°C 2021-11-29 15:53
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

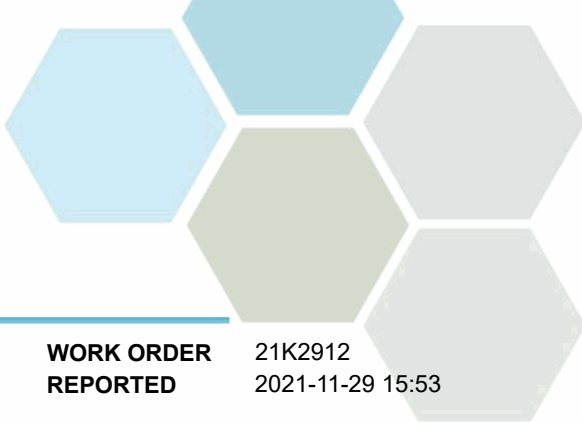
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Authorized By:

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Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K2912
2021-11-29 15:53

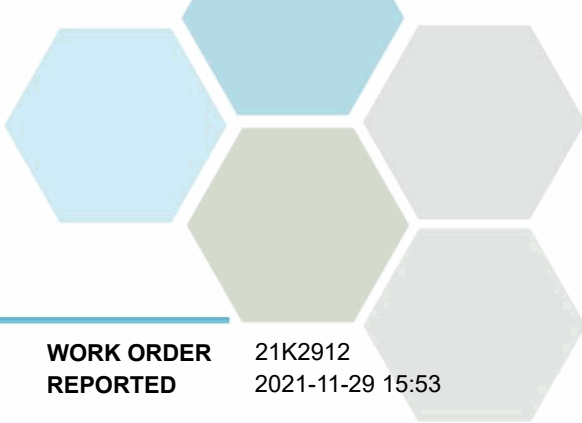
Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21K2912-01) Matrix: Water Sampled: 2021-11-22 13:15					PRES

General Parameters

Phosphorus, Total (as P)	0.0249	0.0050	mg/L	2021-11-29	
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Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K2912
2021-11-29 15:53

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna

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

Glossary of Terms:

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mg/L	Milligrams per litre
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K3799
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-30 12:00 / 5.9°C
PO NUMBER	OK Falls WW	REPORTED	2021-12-02 14:44
PROJECT	OK Falls WWTP MCW	COC NUMBER	No Number
PROJECT INFO			

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Work Order Comments:

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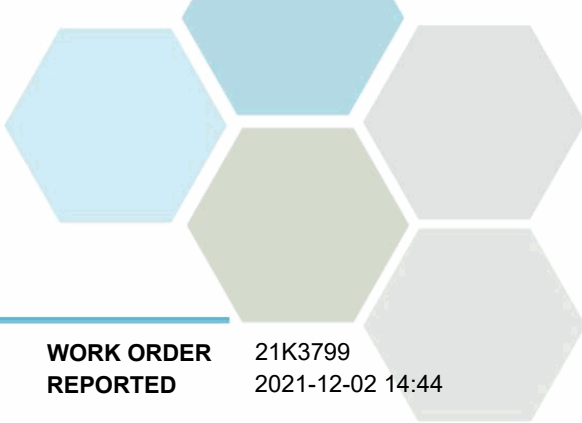
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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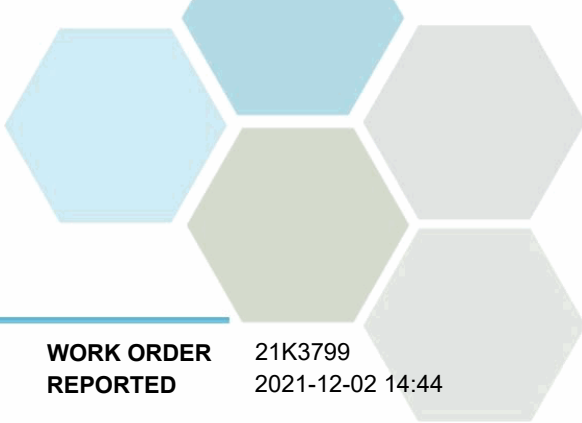


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K3799
2021-12-02 14:44

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet - Bacteria (21K3799-01) Matrix: Water Sampled: 2021-11-29 13:10					
<i>Microbiological Parameters</i>					
E. coli (Q-Tray)	2	1	MPN/100 mL	2021-11-30	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K3799
2021-12-02 14:44

Analysis Description	Method Ref.	Technique	Accredited	Location
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K3800
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-30 12:00 / 5.9°C
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MCW		
PROJECT INFO			

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Work Order Comments:

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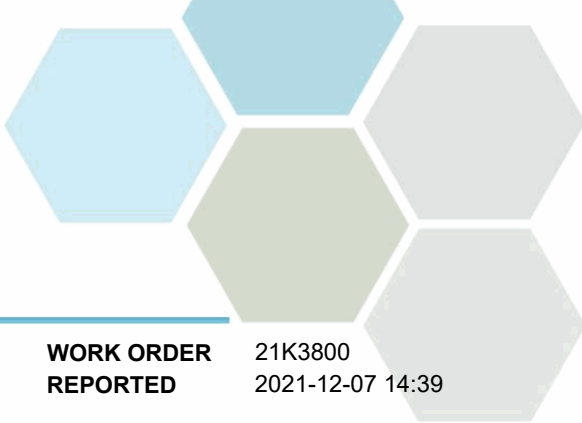
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TEST RESULTS

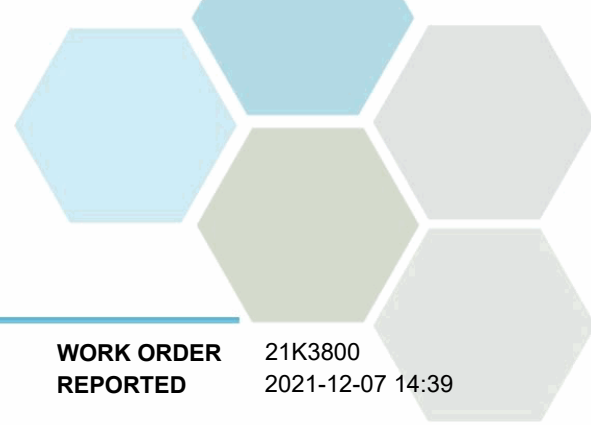
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K3800
2021-12-07 14:39

Analyte	Result	RL	Units	Analyzed	Qualifier
OKFWWTP - Wetland Outlet (21K3800-01) Matrix: Water Sampled: 2021-11-29 13:10					PRES
<i>General Parameters</i>					
Phosphorus, Total (as P)	0.0266	0.0050	mg/L	2021-12-06	

Sample Qualifiers:

PRES Sample has been preserved for TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MCW

WORK ORDER REPORTED 21K3800
2021-12-07 14:39

Analysis Description	Method Ref.	Technique	Accredited	Location
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	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)
mg/L	Milligrams per litre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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 O

Offsite Wells along HWY 97 Water Quality Monitoring Database Summary 2021

Appendix O

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Guideline							1998 Hwy 97	2050 Hwy 97	2050 Hwy 97
		GCDWQ MAC	GCDWQ AO	BCAWQG I	BCWWQG I	BC SDWQG MAC	BC SDWQG AQ	CSR DW	Date Sampled	Date Sampled	Date Sampled
									Lab Sample ID	Lab Sample ID	Lab Sample ID
									Sample Type	Sample Type	Sample Type
Field Results											
Conductivity	µS/cm	NG	NG	NG	700 ^{4.1}	NG	NG	NG	1103	843	828
Dissolved oxygen	mg/L	NG	NG	NG	NG	NG	NG	NG	0.6	0.09	0.18
Oxidation reduction potential	mV	NG	NG	NG	NG	NG	NG	NG	86.4	-118.1	20.7
pH		NG	7.0 - 10.5 ^{2.1}	5.0 - 9.5 ^{3.1}	NG	NG	NG	NG	7.84	7.8	7.6
Temperature	°C	NG	15	N ^{3.2}	NG	NG	15	NG	13.4	13.8	13
Total dissolved solids	mg/L	NG	500	NG	500 ^{4.2}	NG	NG	NG	715	546	0.5395
Turbidity	NTU	N ^{1.1}	NG	N ^{3.3}	NG	N ^{5.1}	NG	NG	0.32	1.78	
Lab Results											
General											
Alkalinity (bicarbonate, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	171	176	179
Alkalinity (carbonate, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	<1.0	<1.0	<1.0
Alkalinity (hydroxide, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	<1.0	<1.0	<1.0
Alkalinity (phenolphthalein, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	<1.0	<1.0	<1.0
Alkalinity (total, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	171	176	179
Bicarbonate Alkalinity (as HCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	209	215	219
Carbonate Alkalinity (as CO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.600	<0.600	<0.600
Hydroxide Alkalinity (as OH)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.340	<0.340	<0.340
Bromide	mg/L	NG	NG	NG	NG	NG	NG	NG	0.25	<0.10	<0.10
Chemical Oxygen Demand	mg/L	NG	NG	NG	NG	NG	NG	NG	5	<5	<5
Chloride	mg/L	NG	250	100	NG	NG	250	250 ^{7.8}	143	103	98.2
Conductivity	µS/cm	NG	NG	NG	700 ^{4.7}	NG	NG	NG	1130	873	826
Fluoride	mg/L	1.5	NG	2.0 ^{3.13}	NG	1.5	NG	1.500	2.51	2.01	2.11
Hardness, Total (dissolved as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	180	335	323
pH		NG	7.0 - 10.5 ^{2.4}	5.0 - 9.5 ^{3.14}	NG	NG	NG	NG	8.18	8.15	8.06
Sulphate	mg/L	NG	500 ^{2.5}	NG	NG	NG	500	500 ^{7.9}	159	98.7	102
Microbiological											
Background Bacteria	CFU/100 mL	NG	NG	NG	NG	NG	NG	NG		>200	
E. coli (counts)	CFU/100 mL	0 ^{1.10}	NG	385 ^{3.15}	NG	10 ^{5.3}	NG	NG	<1	<1	<1
Fecal coliforms (counts)	CFU/100 mL	0 ^{1.11}	NG	1000 ^{3.16}	NG	10 ^{5.4}	NG	NG			<1
Total coliforms (counts)	CFU/100 mL	0 ^{1.12}	NG	NG	NG	NG	NG	NG	<1	>=2	2
Nutrients											
Ammonia (total, as N)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.050	<0.050	0.08
Nitrate (as N)	mg/L	10	NG	NG	NG	10	NG	10 ^{7.10}	1.4	1.46	1.1
Nitrite (as N)	mg/L	1	NG	NG	NG	1.0	NG	1	<0.010	<0.010	0.025
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	NG	NG	NG	NG	NG	N ^{6.1}	NG	<0.050	<0.050	<0.050
Phosphorus (total, by ICPMS/ICPOES)	mg/L	NG	NG	NG	NG	NG	N ^{6.2}	NG	<0.050	<0.050	<0.050
Potassium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	2.82	5.43	5.2
Potassium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	2.64	5.05	5.33

Appendix O

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Guideline							1998 Hwy 97	2050 Hwy 97	2050 Hwy 97
		GCDWQ MAC	GCDWQ AO	BCAWQG I	BCWWQG I	BC SDWQG MAC	BC SDWQG AQ	CSR DW	Date Sampled	Date Sampled	Date Sampled
									Lab Sample ID	Lab Sample ID	Lab Sample ID
								2112161-01	2112165-01	21K3802-01	
								Normal	Normal	Normal	
Dissolved Metals											
Aluminum (dissolved)	mg/L	2.9 ^{1.2}	0.100 ^{2.2}	5 ^{3.4}	NG	9.5	NG	9.500 ^{7.1}	0.0052	<0.0050	<0.0050
Antimony (dissolved)	mg/L	0.006	NG	NG	NG	0.006	NG	0.006	<0.00020	<0.00020	<0.00020
Arsenic (dissolved)	mg/L	0.010 ^{1.3}	NG	0.100 ^{3.5}	NG	0.01	NG	0.010	0.0448	0.00075	0.00074
Barium (dissolved)	mg/L	2.0 ^{1.4}	NG	NG	NG	NG	NG	1.000	0.0199	0.0325	0.0333
Beryllium (dissolved)	mg/L	NG	NG	NG	0.100	NG	NG	0.008	<0.00010	<0.00010	<0.00010
Bismuth (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	<0.00010	<0.00010
Boron (dissolved)	mg/L	5	NG	0.5 ^{3.6}	NG	5.0	NG	5.000	0.3	0.114	0.158
Cadmium (dissolved)	mg/L	0.007 ^{1.5}	NG	NG	0.0051 ^{4.3}	0.005	NG	0.005	<0.000010	<0.000010	0.000018
Calcium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	42.1	63.3	62.8
Chromium (dissolved)	mg/L	0.05	NG	NG	0.0049 ^{4.4}	0.05	NG	0.050 ^{7.2}	<0.00050	<0.00050	<0.00050
Cobalt (dissolved)	mg/L	NG	NG	NG	0.050 ^{4.5}	0.001	NG	0.001	<0.00010	<0.00010	<0.00010
Copper (dissolved)	mg/L	2 ^{1.6}	1	0.200 ^{3.7}	NG	2.0 ^{5.2}	1.0	1.500 ^{7.3}	0.00091	<0.00040	<0.00040
Iron (dissolved)	mg/L	NG	0.3	NG	NG	NG	0.3	6.500 ^{7.4}	<0.010	0.203	0.083
Lead (dissolved)	mg/L	0.005 ^{1.7}	NG	0.200 ^{3.8}	NG	0.005	NG	0.010	<0.00020	<0.00020	<0.00020
Lithium (dissolved)	mg/L	NG	NG	NG	0.75 ^{4.6}	NG	NG	0.008	0.0519	0.0138	0.0129
Magnesium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	18.2	43	40.4
Manganese (dissolved)	mg/L	0.12 ^{1.8}	0.02 ^{2.3}	NG	0.200	0.12	0.02	1.500 ^{7.5}	0.00093	0.0677	0.0565
Mercury (dissolved)	mg/L	0.001	NG	0.0020 ^{3.9}	NG	0.001	NG	0.001	<0.000010	<0.000010	<0.000010
Molybdenum (dissolved)	mg/L	NG	NG	0.01 ^{3.10}	NG	0.088	NG	0.250	0.0103	0.0184	0.0168
Nickel (dissolved)	mg/L	NG	NG	NG	0.200	0.08	NG	0.080	<0.00040	0.0005	0.00055
Selenium (dissolved)	mg/L	0.05	NG	0.010 ^{3.11}	NG	0.01	NG	0.010	0.00624	0.0125	0.013
Silicon (dissolved, as Si)	mg/L	NG	NG	NG	NG	NG	NG	NG	8.6	8.9	8.8
Silver (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	0.020	<0.000050	<0.000050	<0.000050
Sodium (dissolved)	mg/L	NG	200	NG	NG	NG	NG	200 ^{7.6}	174	46.8	44.3
Strontium (dissolved)	mg/L	7.0 ^{1.9}	NG	NG	NG	7.0	NG	2.500	1.39	1.61	1.35
Sulphur (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	55.9	37.4	33.7
Tellurium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00050	<0.00050	<0.00050
Thallium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.000020	<0.000020	<0.000020
Thorium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	<0.00010	<0.00010
Tin (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	2.500	<0.00020	<0.00020	<0.00020
Titanium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.0050	<0.0050	<0.0050
Tungsten (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	0.003	<0.0010	<0.0010	<0.0010
Uranium (dissolved)	mg/L	0.02	NG	NG	0.010	0.02	NG	0.020	0.00544	0.00527	0.00492
Vanadium (dissolved)	mg/L	NG	NG	NG	0.100	NG	NG	0.020	<0.0010	<0.0010	<0.0010
Zinc (dissolved)	mg/L	NG	5.0	1.000 ^{3.12}	NG	3.0	5.0	3.000 ^{7.7}	<0.0040	<0.0040	0.0132
Zirconium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	<0.00010	<0.00010

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Guideline							1998 Hwy 97	2050 Hwy 97	2050 Hwy 97
		GCDWQ MAC	GCDWQ AO	BCAWQG I	BCWWQG I	BC SDWQG MAC	BC SDWQG AQ	CSR DW	Date Sampled	Date Sampled	Date Sampled
									Lab Sample ID	Lab Sample ID	Lab Sample ID
								2112161-01	2112165-01	21K3802-01	
								Normal	Normal	Normal	
Total Metals											
Aluminum (total)	mg/L	2.9 ^{1.15}	0.100 ^{2.6}	5 ^{3.17}	NG	9.5	NG	9.500 ^{7.13}	0.0078	<0.0050	<0.0050
Antimony (total)	mg/L	0.006	NG	NG	NG	0.006	NG	0.006	<0.00020	<0.00020	<0.00020
Arsenic (total)	mg/L	0.010 ^{1.16}	NG	0.100 ^{3.18}	NG	0.01	NG	0.010	0.0413	0.00068	0.0009
Barium (total)	mg/L	2.0 ^{1.17}	NG	NG	NG	NG	NG	1.000	0.0195	0.0295	0.0331
Beryllium (total)	mg/L	NG	NG	NG	0.100	NG	NG	0.008	<0.00010	<0.00010	<0.00010
Bismuth (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	<0.00010	<0.00010
Boron (total)	mg/L	5	NG	0.5 ^{3.19}	NG	5.0	NG	5.000	0.294	0.106	0.126
Cadmium (total)	mg/L	0.007 ^{1.18}	NG	NG	0.0051 ^{4.8}	0.005	NG	0.005	0.000011	0.000018	0.000015
Calcium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	40.4	57.9	66.7
Chromium (total)	mg/L	0.05	NG	NG	0.0049 ^{4.9}	0.05	NG	0.050 ^{7.14}	<0.00050	<0.00050	<0.00050
Cobalt (total)	mg/L	NG	NG	NG	0.050 ^{4.10}	0.001	NG	0.001	<0.00010	<0.00010	<0.00010
Copper (total)	mg/L	2 ^{1.19}	1	0.200 ^{3.20}	NG	2.0 ^{5.5}	1.0	1.500 ^{7.15}	0.00111	0.00117	0.00063
Iron (total)	mg/L	NG	0.3	NG	NG	NG	0.3	6.500 ^{7.16}	0.011	0.365	0.238
Lead (total)	mg/L	0.005 ^{1.20}	NG	0.200 ^{3.21}	NG	0.005	NG	0.010	<0.00020	<0.00020	<0.00020
Lithium (total)	mg/L	NG	NG	NG	0.75 ^{4.11}	NG	NG	0.008	0.0497	0.0126	0.014
Magnesium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	17.8	40.4	42.1
Manganese (total)	mg/L	0.12 ^{1.21}	0.02 ^{2.7}	NG	0.200	0.12	0.02	1.500 ^{7.17}	0.00103	0.0693	0.0606
Mercury (total)	mg/L	0.001	NG	0.0020	NG	0.001	NG	0.001	<0.000010	<0.000010	<0.000010
Molybdenum (total)	mg/L	NG	NG	0.01 ^{3.22}	NG	0.088	NG	0.250	0.00996	0.0167	0.0181
Nickel (total)	mg/L	NG	NG	NG	0.200	0.08	NG	0.080	<0.00040	0.00044	0.00062
Selenium (total)	mg/L	0.05	NG	0.010 ^{3.23}	NG	0.01	NG	0.010	0.00591	0.0111	0.0135
Silicon (total, as Si)	mg/L	NG	NG	NG	NG	NG	NG	NG	8.2	8.1	9.1
Silver (total)	mg/L	NG	NG	NG	NG	NG	NG	0.020	<0.000050	<0.000050	<0.000050
Sodium (total)	mg/L	NG	200	NG	NG	NG	NG	200 ^{7.18}	168	43.5	46.2
Strontium (total)	mg/L	7.0 ^{1.22}	NG	NG	NG	7.0	NG	2.500	1.27	1.48	1.43
Sulphur (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	54	32.4	34.8
Tellurium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00050	<0.00050	<0.00050
Thallium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.000020	<0.000020	<0.000020
Thorium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	<0.00010	<0.00010
Tin (total)	mg/L	NG	NG	NG	NG	NG	NG	2.500	<0.00020	<0.00020	<0.00020
Titanium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	0.0123	<0.0050	<0.0050
Tungsten (total)	mg/L	NG	NG	NG	NG	NG	NG	0.003	<0.0010	<0.0010	<0.0010
Uranium (total)	mg/L	0.02	NG	NG	0.010	0.02	NG	0.020	0.00529	0.00474	0.00531
Vanadium (total)	mg/L	NG	NG	NG	0.100	NG	NG	0.020	<0.0010	<0.0010	<0.0010
Zinc (total)	mg/L	NG	5.0	1.000 ^{3.24}	NG	3.0	5.0	3.000 ^{7.19}	<0.0040	<0.0040	0.0067
Zirconium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	0.00012	<0.00010	<0.00010

Appendix O

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Guideline							2100 Hwy 97	2150 Hwy 97
		GCDWQ MAC	GCDWQ AO	BCAWQG I	BCWWQG I	BC SDWQG MAC	BC SDWQG AQ	CSR DW	Date Sampled	Date Sampled
									2112166-01	2112167-01
									Normal	Normal
Field Results										
Conductivity	µS/cm	NG	NG	NG	700 ^{4.1}	NG	NG	NG	459.8	722
Dissolved oxygen	mg/L	NG	NG	NG	NG	NG	NG	NG	0.15	0.15
Oxidation reduction potential	mV	NG	NG	NG	NG	NG	NG	NG	-89.4	-14.8
pH		NG	7.0 - 10.5 ^{2.1}	5.0 - 9.5 ^{3.1}	NG	NG	NG	NG	7.87	7.57
Temperature	°C	NG	15	N ^{3.2}	NG	NG	15	NG	13.2	12.3
Total dissolved solids	mg/L	NG	500	NG	500 ^{4.2}	NG	NG	NG	299	468
Turbidity	NTU	N ^{1.1}	NG	N ^{3.3}	NG	N ^{5.1}	NG	NG	0.62	0.22
Lab Results										
General										
Alkalinity (bicarbonate, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	185	255
Alkalinity (carbonate, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	<1.0	<1.0
Alkalinity (hydroxide, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	<1.0	<1.0
Alkalinity (phenolphthalein, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	<1.0	<1.0
Alkalinity (total, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	185	255
Bicarbonate Alkalinity (as HCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	226	312
Carbonate Alkalinity (as CO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.600	<0.600
Hydroxide Alkalinity (as OH)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.340	<0.340
Bromide	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.10	<0.10
Chemical Oxygen Demand	mg/L	NG	NG	NG	NG	NG	NG	NG	<5	6
Chloride	mg/L	NG	250	100	NG	NG	250	250 ^{7.8}	8.79	43.3
Conductivity	µS/cm	NG	NG	NG	700 ^{4.7}	NG	NG	NG	468	735
Fluoride	mg/L	1.5	NG	2.0 ^{3.13}	NG	1.5	NG	1.500	0.38	0.41
Hardness, Total (dissolved as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	232	336
pH		NG	7.0 - 10.5 ^{2.4}	5.0 - 9.5 ^{3.14}	NG	NG	NG	NG	8.17	8.12
Sulphate	mg/L	NG	500 ^{2.5}	NG	NG	NG	500	500 ^{7.9}	59.2	80.5
Microbiological										
Background Bacteria	CFU/100 mL	NG	NG	NG	NG	NG	NG	NG		
E. coli (counts)	CFU/100 mL	0 ^{1.10}	NG	385 ^{3.15}	NG	10 ^{5.3}	NG	NG		<1
Fecal coliforms (counts)	CFU/100 mL	0 ^{1.11}	NG	1000 ^{3.16}	NG	10 ^{5.4}	NG	NG		
Total coliforms (counts)	CFU/100 mL	0 ^{1.12}	NG	NG	NG	NG	NG	NG		<1
Nutrients										
Ammonia (total, as N)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.050	<0.050
Nitrate (as N)	mg/L	10	NG	NG	NG	10	NG	10 ^{7.10}	0.832	0.045
Nitrite (as N)	mg/L	1	NG	NG	NG	1.0	NG	1	<0.010	<0.010
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	NG	NG	NG	NG	NG	N ^{6.1}	NG	<0.050	<0.050
Phosphorus (total, by ICPMS/ICPOES)	mg/L	NG	NG	NG	NG	NG	N ^{6.2}	NG		<0.050
Potassium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	3.43	4.37
Potassium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG		4.33

Appendix O

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Guideline							2100 Hwy 97	2150 Hwy 97
		GCDWQ MAC	GCDWQ AO	BCAWQG I	BCWWQG I	BC SDWQG MAC	BC SDWQG AQ	CSR DW	Date Sampled	Date Sampled
									2112166-01	2112167-01
								Normal	Normal	
Dissolved Metals										
Aluminum (dissolved)	mg/L	2.9 ^{1.2}	0.100 ^{2.2}	5 ^{3.4}	NG	9.5	NG	9.500 ^{7.1}	0.187	<0.0050
Antimony (dissolved)	mg/L	0.006	NG	NG	NG	0.006	NG	0.006	<0.00020	<0.00020
Arsenic (dissolved)	mg/L	0.010 ^{1.3}	NG	0.100 ^{3.5}	NG	0.01	NG	0.010	0.00237	0.00117
Barium (dissolved)	mg/L	2.0 ^{1.4}	NG	NG	NG	NG	NG	1.000	0.162	0.199
Beryllium (dissolved)	mg/L	NG	NG	NG	0.100	NG	NG	0.008	<0.00010	<0.00010
Bismuth (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	<0.00010
Boron (dissolved)	mg/L	5	NG	0.5 ^{3.6}	NG	5.0	NG	5.000	<0.0500	<0.0500
Cadmium (dissolved)	mg/L	0.007 ^{1.5}	NG	NG	0.0051 ^{4.3}	0.005	NG	0.005	<0.000010	<0.000010
Calcium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	69.3	102
Chromium (dissolved)	mg/L	0.05	NG	NG	0.0049 ^{4.4}	0.05	NG	0.050 ^{7.2}	<0.00050	<0.00050
Cobalt (dissolved)	mg/L	NG	NG	NG	0.050 ^{4.5}	0.001	NG	0.001	<0.00010	<0.00010
Copper (dissolved)	mg/L	2 ^{1.6}	1	0.200 ^{3.7}	NG	2.0 ^{5.2}	1.0	1.500 ^{7.3}	0.00052	0.00073
Iron (dissolved)	mg/L	NG	0.3	NG	NG	NG	0.3	6.500 ^{7.4}	0.082	0.036
Lead (dissolved)	mg/L	0.005 ^{1.7}	NG	0.200 ^{3.8}	NG	0.005	NG	0.010	<0.00020	<0.00020
Lithium (dissolved)	mg/L	NG	NG	NG	0.75 ^{4.6}	NG	NG	0.008	0.0057	0.00827
Magnesium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	14.3	20
Manganese (dissolved)	mg/L	0.12 ^{1.8}	0.02 ^{2.3}	NG	0.200	0.12	0.02	1.500 ^{7.5}	0.0907	0.0107
Mercury (dissolved)	mg/L	0.001	NG	0.0020 ^{3.9}	NG	0.001	NG	0.001	<0.000010	<0.000010
Molybdenum (dissolved)	mg/L	NG	NG	0.01 ^{3.10}	NG	0.088	NG	0.250	0.00252	0.00188
Nickel (dissolved)	mg/L	NG	NG	NG	0.200	0.08	NG	0.080	<0.00040	0.00237
Selenium (dissolved)	mg/L	0.05	NG	0.010 ^{3.11}	NG	0.01	NG	0.010	0.00123	0.00062
Silicon (dissolved, as Si)	mg/L	NG	NG	NG	NG	NG	NG	NG	11.3	9.7
Silver (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	0.020	<0.000050	<0.000050
Sodium (dissolved)	mg/L	NG	200	NG	NG	NG	NG	200 ^{7.6}	9.42	20.1
Strontium (dissolved)	mg/L	7.0 ^{1.9}	NG	NG	NG	7.0	NG	2.500	0.654	0.908
Sulphur (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	20.1	27.6
Tellurium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00050	<0.00050
Thallium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.000020	<0.000020
Thorium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	<0.00010
Tin (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	2.500	<0.00020	<0.00020
Titanium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.0050	<0.0050
Tungsten (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	0.003	<0.0010	<0.0010
Uranium (dissolved)	mg/L	0.02	NG	NG	0.010	0.02	NG	0.020	0.00204	0.00547
Vanadium (dissolved)	mg/L	NG	NG	NG	0.100	NG	NG	0.020	<0.0010	<0.0010
Zinc (dissolved)	mg/L	NG	5.0	1.000 ^{3.12}	NG	3.0	5.0	3.000 ^{7.7}	<0.0040	0.0055
Zirconium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	<0.00010

Appendix O

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Guideline							2100 Hwy 97	2150 Hwy 97
		GCDWQ	GCDWQ AO	BCAWQG I	BCWWQG I	BC SDWQG	BC SDWQG	CSR DW	Date Sampled	Date Sampled
		MAC				MAC	AO		2112166-01	2112167-01
									Normal	Normal
Total Metals										
Aluminum (total)	mg/L	2.9 ^{1.15}	0.100 ^{2.6}	5 ^{3.17}	NG	9.5	NG	9.500 ^{7.13}	0.0052	
Antimony (total)	mg/L	0.006	NG	NG	NG	0.006	NG	0.006	<0.00020	
Arsenic (total)	mg/L	0.010 ^{1.16}	NG	0.100 ^{3.18}	NG	0.01	NG	0.010	0.00118	
Barium (total)	mg/L	2.0 ^{1.17}	NG	NG	NG	NG	NG	1.000	0.199	
Beryllium (total)	mg/L	NG	NG	NG	0.100	NG	NG	0.008	<0.00010	
Bismuth (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	
Boron (total)	mg/L	5	NG	0.5 ^{3.19}	NG	5.0	NG	5.000	<0.0500	
Cadmium (total)	mg/L	0.007 ^{1.18}	NG	NG	0.0051 ^{4.8}	0.005	NG	0.005	0.00001	
Calcium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	104	
Chromium (total)	mg/L	0.05	NG	NG	0.0049 ^{4.9}	0.05	NG	0.050 ^{7.14}	<0.00050	
Cobalt (total)	mg/L	NG	NG	NG	0.050 ^{4.10}	0.001	NG	0.001	<0.00010	
Copper (total)	mg/L	2 ^{1.19}	1	0.200 ^{3.20}	NG	2.0 ^{5.5}	1.0	1.500 ^{7.15}	0.00133	
Iron (total)	mg/L	NG	0.3	NG	NG	NG	0.3	6.500 ^{7.16}	0.057	
Lead (total)	mg/L	0.005 ^{1.20}	NG	0.200 ^{3.21}	NG	0.005	NG	0.010	<0.00020	
Lithium (total)	mg/L	NG	NG	NG	0.75 ^{4.11}	NG	NG	0.008	0.00829	
Magnesium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	19.9	
Manganese (total)	mg/L	0.12 ^{1.21}	0.02 ^{2.7}	NG	0.200	0.12	0.02	1.500 ^{7.17}	0.0109	
Mercury (total)	mg/L	0.001	NG	0.0020	NG	0.001	NG	0.001	<0.000010	
Molybdenum (total)	mg/L	NG	NG	0.01 ^{3.22}	NG	0.088	NG	0.250	0.00192	
Nickel (total)	mg/L	NG	NG	NG	0.200	0.08	NG	0.080	0.00242	
Selenium (total)	mg/L	0.05	NG	0.010 ^{3.23}	NG	0.01	NG	0.010	0.00067	
Silicon (total, as Si)	mg/L	NG	NG	NG	NG	NG	NG	NG	9.9	
Silver (total)	mg/L	NG	NG	NG	NG	NG	NG	0.020	<0.000050	
Sodium (total)	mg/L	NG	200	NG	NG	NG	NG	200 ^{7.18}	20	
Strontium (total)	mg/L	7.0 ^{1.22}	NG	NG	NG	7.0	NG	2.500	0.91	
Sulphur (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	28.1	
Tellurium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00050	
Thallium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.000020	
Thorium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	
Tin (total)	mg/L	NG	NG	NG	NG	NG	NG	2.500	<0.00020	
Titanium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.0050	
Tungsten (total)	mg/L	NG	NG	NG	NG	NG	NG	0.003	<0.0010	
Uranium (total)	mg/L	0.02	NG	NG	0.010	0.02	NG	0.020	0.00564	
Vanadium (total)	mg/L	NG	NG	NG	0.100	NG	NG	0.020	<0.0010	
Zinc (total)	mg/L	NG	5.0	1.000 ^{3.24}	NG	3.0	5.0	3.000 ^{7.19}	0.0057	
Zirconium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	<0.00010	

Water Quality Results

Sampling Location	Guideline	Exceedances
1998 Hwy 97	GCDWQ MAC	Arsenic (dissolved), Arsenic (total), Fluoride
	GCDWQ AO	Total dissolved solids [F]
	BCAWQG I	Chloride, Fluoride, Molybdenum (dissolved)
	BCWWQG I	Conductivity [F], Conductivity, Total dissolved solids [F]
	BC SDWQG MAC	Arsenic (dissolved), Arsenic (total), Fluoride
	CSR DW	Arsenic (dissolved), Arsenic (total), Fluoride, Lithium (dissolved), Lithium (total)
2050 Hwy 97	GCDWQ MAC	Fluoride, Total coliforms (counts)
	GCDWQ AO	Iron (total), Manganese (dissolved), Manganese (total), Total dissolved solids [F]
	BCAWQG I	Chloride, Fluoride, Molybdenum (dissolved), Molybdenum (total), Selenium (dissolved), Selenium (total)
	BCWWQG I	Conductivity [F], Conductivity, Total dissolved solids [F]
	BC SDWQG MAC	Fluoride, Selenium (dissolved), Selenium (total)
	BC SDWQG AO	Iron (total), Manganese (dissolved), Manganese (total)
	CSR DW	Fluoride, Lithium (dissolved), Lithium (total), Selenium (dissolved), Selenium (total)
2100 Hwy 97	GCDWQ AO	Aluminum (dissolved), Manganese (dissolved)
	BC SDWQG AO	Manganese (dissolved)
2150 Hwy 97	BCWWQG I	Conductivity [F], Conductivity
	CSR DW	Lithium (dissolved), Lithium (total)

[F] = Field Result(s)

	1998 Hwy 97	2050 Hwy 97	2100 Hwy 97	2150 Hwy 97
Field Results				
Conductivity	X	X		X
Total dissolved solids	X	X		
Lab Results				
General				
Chloride	X	X		
Conductivity	X	X		X
Fluoride	X	X		
Microbiological				
Total coliforms (counts)		X		
Dissolved Metals				
Aluminum (dissolved)			X	
Arsenic (dissolved)	X			
Lithium (dissolved)	X	X		X
Manganese (dissolved)		X	X	
Molybdenum (dissolved)	X	X		
Selenium (dissolved)		X		
Total Metals				
Arsenic (total)	X			
Iron (total)		X		
Lithium (total)	X	X		X
Manganese (total)		X		
Molybdenum (total)		X		
Selenium (total)		X		

Guideline Notes for Reports for RDOS Landfill and Wastewater Treatment Sites Water Quality Results**1. Notes for Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations (GCDWQ MAC)****Note 1.1 for Turbidity:**

Waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source water to meet health-based turbidity limits, as defined for specific treatment technologies. Where possible, filtration systems should be designed and operated to reduce turbidity levels as low as possible, with a treated water turbidity target of less than 0.1 NTU at all times. Where this is not achievable, the treated water turbidity levels from individual filters should meet the requirements described in GCDWQ.

For systems that use groundwater that is not under the direct influence of surface water, which are considered less vulnerable to faecal contamination, turbidity should generally be below 1.0 NTU.

For effective operation of the distribution system, it is good practice to ensure that water entering the distribution system has turbidity levels below 1.0 NTU.

Note 1.2 for Aluminum (dissolved):

The maximum acceptable concentration (MAC) for total aluminum in drinking water is 2.9 mg/L (2 900 µg/L) based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. (Update March 5, 2021)

Note 1.3 for Arsenic (dissolved):

Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 1.4 for Barium (dissolved):

Update January 24, 2020. The MAC was revised from 1.0 mg/L to 2.0 mg/L.

Note 1.5 for Cadmium (dissolved):

A maximum acceptable concentration (MAC) of 0.007 mg/L (7 µg/L) is established for total cadmium in drinking water, based on a sample of water taken at the tap. (Update July 14, 2020)

Note 1.6 for Copper (dissolved):

A maximum acceptable concentration (MAC) of 2 mg/L is established for total copper in drinking water, based on a sample of water taken at the tap. Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on Copper, June 2019.

Note 1.7 for Lead (dissolved):

The maximum acceptable concentration (MAC) for total lead in drinking water is 0.005 mg/L (5 µg/L), based on a sample of water taken at the tap and using the appropriate protocol for the type of building being sampled. Every effort should be made to maintain lead levels in drinking water as low as reasonably achievable (or ALARA). (GCDWQ: Guideline Technical Document; March, 2019)

Note 1.8 for Manganese (dissolved):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

Note 1.9 for Strontium (dissolved):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on strontium, May 2019.

Note 1.10 for E. coli (counts):

MAC is none detectable per 100 mL

Note 1.11 for Fecal coliforms (counts):

The GCDWQ does not have a guideline for fecal coliforms. The GCDWQ were revised in 2006 when the guideline for fecal coliforms was deleted, and a guideline for E. coli was added. However the GCDWQ has a guideline for total coliforms that includes the following statement: "The maximum acceptable concentration (MAC) of total coliforms in water leaving a treatment plant and in non-disinfected groundwater leaving the well is none detectable per 100 mL." Therefore a guideline of none detectable per 100 mL was used for fecal coliforms for this report.

Note 1.12 for Total coliforms (counts):

The maximum acceptable concentration (MAC) of total coliforms in water leaving a treatment plant and in non-disinfected groundwater leaving the well is none detectable per 100 mL.

Total coliforms should be monitored in the distribution system because they are used to indicate changes in water quality. Detection of total coliforms from consecutive samples from the same site or from more than 10% of the samples collected in a given sampling period should be investigated.

Note 1.13 for Nitrate + Nitrite (as N):

The MAC for Nitrate (as N) is 10 mg/L

Note 1.14 for Nitrate + Nitrite (as N) (calculated):

The MAC for Nitrate (as N) is 10 mg/L

Note 1.15 for Aluminum (total):

The maximum acceptable concentration (MAC) for total aluminum in drinking water is 2.9 mg/L (2 900 µg/L) based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. (Update March 5, 2021)

Note 1.16 for Arsenic (total):

Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 1.17 for Barium (total):

Update January 24, 2020. The MAC was revised from 1.0 mg/L to 2.0 mg/L.

Note 1.18 for Cadmium (total):

A maximum acceptable concentration (MAC) of 0.007 mg/L (7 µg/L) is established for total cadmium in drinking water, based on a sample of water taken at the tap. (Update July 14, 2020)

Note 1.19 for Copper (total):

A maximum acceptable concentration (MAC) of 2 mg/L is established for total copper in drinking water, based on a sample of water taken at the tap. Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on Copper, June 2019.

Note 1.20 for Lead (total):

The maximum acceptable concentration (MAC) for total lead in drinking water is 0.005 mg/L (5 µg/L), based on a sample of water taken at the tap and using the appropriate protocol for the type of building being sampled. Every effort should be made to maintain lead levels in drinking water as low as reasonably achievable (or ALARA). (GCDWQ: Guideline Technical Document; March, 2019)

Note 1.21 for Manganese (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

Note 1.22 for Strontium (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on strontium, May 2019.

2. Notes for Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO)**Note 2.1 for pH:**

The operational guideline for pH is a range of 7.0 to 10.5 in finished drinking water.

Note 2.2 for Aluminum (dissolved):

The operational guidance (OG) value for total aluminum in drinking water is 0.100 mg/L (100 µg/L) to optimize water treatment and distribution system operations. This value is based on a locational running annual average. The sampling frequency required to calculate the locational running annual average will vary based on the type of treatment facility and the sampling location. (Update March 5, 2021)

Note 2.3 for Manganese (dissolved):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

Note 2.4 for pH:

The operational guideline for pH is a range of 7.0 to 10.5 in finished drinking water.

Note 2.5 for Sulphate:

There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L. Health authorities should be notified of drinking water sources containing above 500 mg/L.

Note 2.6 for Aluminum (total):

The operational guidance (OG) value for total aluminum in drinking water is 0.100 mg/L (100 µg/L) to optimize water treatment and distribution system operations. This value is based on a locational running annual average. The sampling frequency required to calculate the locational running annual average will vary based on the type of treatment facility and the sampling location. (Update March 5, 2021)

Note 2.7 for Manganese (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

3. Notes for BC Approved Water Quality Guidelines for irrigation (BCAWQG I)**General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports.

Note 3.1 for pH:

Update August 2019 Summary Report.

Note 3.2 for Temperature:

The recommended guideline for temperature is + or - 1 degree Celsius change from natural ambient background.

Note 3.3 for Turbidity:

Induced turbidity should not exceed 10 NTU when background turbidity is less than or equal to 50 NTU, nor should induced turbidity be more than 20 % of background when background is greater than 50 NTU.

Note 3.4 for Aluminum (dissolved):

The guideline maximum for total aluminum is 5 mg/L. A separate guideline for dissolved aluminum is not provided.

Note 3.5 for Arsenic (dissolved):

The interim guideline for total arsenic is 100 µg/L.

Note 3.6 for Boron (dissolved):

The guideline for total boron depends on the crop, and varies from 0.5 mg/L to 6 mg/L. The most stringent guideline maximum of 0.5 mg/L, for very sensitive and sensitive crops, was used to identify exceedances for this report.

Note 3.7 for Copper (dissolved):

The guideline maximum for total copper is 200 µg/L.

Note 3.8 for Lead (dissolved):

For neutral and alkaline fine-textured soils the total lead concentration in irrigation water should not exceed 400 µg/L at any time. The concentration of total lead in irrigation water for use on all other soils should not exceed 200 µg/L at any time. / The most stringent guideline maximum was used in this report.

Note 3.9 for Mercury (dissolved):

The guideline maximum for total mercury is 2.0 µg/L.

Note 3.10 for Molybdenum (dissolved):

The long-term chronic guidelines for total molybdenum are as follows:

Forage crops-poorly drained soil: 0.01 mg/L

Forage crops-well drained soil: 0.02 mg/L

Non-forage crops: 0.028 mg/L. This guideline is intended to be protective of terrestrial plants and is not necessarily protective of livestock consuming these plants.

The most stringent guideline (0.01 mg/L for forage crops-poorly drained soil) has been used.

Note 3.11 for Selenium (dissolved):

The guideline for total selenium is 10 µg/L mean. The mean concentrations in the water column are based on at least 5 weekly samples taken over a 30-day period.

Note 3.12 for Zinc (dissolved):

The guideline maximum for total zinc for irrigation is as follows:

- Soil pH less than 6: 1000 µg/L.

- Soil pH equal to or greater than 6, and less than 7: 2000 µg/L.

- Soil pH greater than or equal to 7: 5000 µg/L. / The most stringent guideline maximum was used in this report.

Note 3.13 for Fluoride:

Total fluoride in irrigation water should not exceed 1.0 mg/L as a 30-day average or a maximum of 2.0 mg/L.

Note 3.14 for pH:

Update August 2019 Summary Report.

Note 3.15 for E. coli (counts):

The guideline for irrigation for E. coli varies as a function of crop, public access, and livestock access.

The guideline maximum for crops eaten raw is less than or equal to 77/100 mL geometric mean.

The guideline maximum for public access and livestock access is less than or equal to 385/100 mL geometric mean.

The guideline maximum for general irrigation is less than or equal to 1000/100 mL geometric mean. / The guideline for public access and livestock access was used in this report.

Note 3.16 for Fecal coliforms (counts):

The guideline for irrigation for Fecal coliforms depends on the crop, public access, and livestock access.

The guideline maximum for crops eaten raw is less than or equal to 200/100 mL geometric mean.

The guideline for public access and livestock access is "none applicable".

The guideline maximum for general irrigation is less than or equal to 1000/100 mL geometric mean. / The guideline for general irrigation was used in this report.

Note 3.17 for Aluminum (total):

The guideline maximum for total aluminum is 5 mg/L. A separate guideline for dissolved aluminum is not provided.

Note 3.18 for Arsenic (total):

The interim guideline for total arsenic is 100 µg/L.

Note 3.19 for Boron (total):

The guideline for total boron depends on the crop, and varies from 0.5 mg/L to 6 mg/L. The most stringent guideline maximum of 0.5 mg/L, for very sensitive and sensitive crops, was used to identify exceedances for this report.

Note 3.20 for Copper (total):

The guideline maximum for total copper is 200 µg/L.

Note 3.21 for Lead (total):

For neutral and alkaline fine-textured soils the total lead concentration in irrigation water should not exceed 400 µg/L at any time. The concentration of total lead in irrigation water for use on all other soils should not exceed 200 µg/L at any time. / The most stringent guideline maximum was used in this report.

Note 3.22 for Molybdenum (total):

The long-term chronic guidelines for total molybdenum are as follows:

Forage crops-poorly drained soil: 0.01 mg/L

Forage crops-well drained soil: 0.02 mg/L

Non-forage crops: 0.028 mg/L. This guideline is intended to be protective of terrestrial plants and is not necessarily protective of livestock consuming these plants.

The most stringent guideline (0.01 mg/L for irrigation of forage crops-poorly drained soil) has been used.

Note 3.23 for Selenium (total):

The guideline for total selenium is 10 µg/L mean. The mean concentrations in the water column are based on at least 5 weekly samples taken over a 30-day period.

Note 3.24 for Zinc (total):

The guideline maximum for total zinc for irrigation is as follows:

- Soil pH less than 6: 1000 µg/L.

- Soil pH equal to or greater than 6, and less than 7: 2000 µg/L.

- Soil pH greater than or equal to 7: 5000 µg/L. / The most stringent guideline maximum was used in this report.

4. Notes for BC Working Water Quality Guidelines for Irrigation (2020) (BCWWQG I)**General Notes:**

Reference: B.C. Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (2021). WWQG values are long-term (i.e. average) concentrations unless identified as a short-term maximum in the "Notes" for a specific analyte. Long-term WWQGs represent average substance concentrations calculated from 5 samples in 30 days. WWQG are given for total substance concentrations unless otherwise noted.

Note 4.1 for Conductivity:

The guideline varies from 700 to 5000 $\mu\text{S}/\text{cm}$ depending on the type of crop. The most stringent guideline has been used for this report.

Note 4.2 for Total dissolved solids:

The guideline varies from 500 to 3500 mg/L depending on the type of crop. The most stringent guideline has been used for this report.

Note 4.3 for Cadmium (dissolved):

This is a Short-term maximum guideline.

Note 4.4 for Chromium (dissolved):

The guideline for Cr(VI) is 8 $\mu\text{g}/\text{L}$ (total).

The guideline for Cr(III) is 4.9 $\mu\text{g}/\text{L}$ (total).

The guideline of 4.9 $\mu\text{g}/\text{L}$ for Cr(III) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 4.5 for Cobalt (dissolved):

Continuous or intermittent use on all soils.

Note 4.6 for Lithium (dissolved):

The guideline is 2.5 mg/L for non-citrus crops (May not be protective of barley and other cereal crops; 1.0 mg/L suggested for cereal crops). The guideline is 0.75 mg/L for citrus crops. / The most stringent guideline was used in this report.

Note 4.7 for Conductivity:

The guideline varies from 700 to 5000 $\mu\text{S}/\text{cm}$ depending on the type of crop. The most stringent guideline has been used for this report.

Note 4.8 for Cadmium (total):

This is a Short-term maximum guideline.

Note 4.9 for Chromium (total):

The guideline for Cr(VI) is 8 $\mu\text{g}/\text{L}$ (total).

The guideline for Cr(III) is 4.9 $\mu\text{g}/\text{L}$ (total).

The guideline of 4.9 $\mu\text{g}/\text{L}$ for Cr(III) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 4.10 for Cobalt (total):

Continuous or intermittent use on all soils.

Note 4.11 for Lithium (total):

The guideline is 2.5 mg/L for non-citrus crops (May not be protective of barley and other cereal crops; 1.0 mg/L suggested for cereal crops). The guideline is 0.75 mg/L for citrus crops. / The most stringent guideline was used in this report.

5. Notes for BC Source Drinking Water Quality Guidelines - Maximum Acceptable Concentrations (2020 and updates) (BC SDWQG MAC)**General Notes:**

The source drinking water quality guidelines apply to the ambient water before it is treated and distributed for domestic use. The guidelines apply to drinking water sources from surface water and groundwater.

Note 5.1 for Turbidity:

For raw drinking water without treatment for particulates the guideline is: ≤ 1 NTU of turbidity.

For raw drinking water with treatment for particulates the guideline is:

Natural background turbidity is ≤ 50 NTU: Change from background should not exceed 5 NTU.

Natural background turbidity is > 50 NTU: Change from background should not exceed 10% of the background turbidity.

Note 5.2 for Copper (dissolved):

Includes short-term and long-term exposure.

Note 5.3 for E. coli (counts):

The MAC is ≤ 10 E. coli /100 mL; 90th percentile (minimum of 5 samples).

Note 5.4 for Fecal coliforms (counts):

The MAC is ≤ 10 coliforms/100 mL; 90th percentile (minimum of 5 samples).

Note 5.5 for Copper (total):

Includes short-term and long-term exposure.

6. Notes for BC Source Drinking Water Quality Guidelines - Aesthetic Objectives (2020 and updates) (BC SDWQG AO)**General Notes:**

The source drinking water quality guidelines apply to the ambient water before it is treated and distributed for domestic use. The guidelines apply to drinking water sources from surface water and groundwater.

Note 6.1 for Phosphorus (dissolved, by ICPMS/ICPOES):

The AO for lakes is 0.01 mg/L. For lakes with residence time > 6 months, measure total P during spring overturn. For lakes with residence time < 6 months, measure mean epilimnetic total P during the growing season (ENV 1985).

Note 6.2 for Phosphorus (total, by ICPMS/ICPOES):

The AO for lakes is 0.01 mg/L. For lakes with residence time > 6 months, measure total P during spring overturn. For lakes with residence time < 6 months, measure mean epilimnetic total P during the growing season (ENV 1985).

7. Notes for BC CSR Generic Numerical Water Standards for Drinking Water (CSR DW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Drinking water standards are for unfiltered samples obtained at the point of consumption. Heavy metals, metalloids and inorganic ions are expressed as total substance concentrations unless otherwise indicated.

Note 7.1 for Aluminum (dissolved):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 7.2 for Chromium (dissolved):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 50 µg/L for chromium, hexavalent. Standard is 6000 µg/L for chromium, trivalent. The standard of 50 µg/L was used to identify exceedances for dissolved chromium in order to demonstrate compliance with the standards.

Note 7.3 for Copper (dissolved):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 7.4 for Iron (dissolved):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

- (a) item A6, A7, A8 or A11
- (b) item C1, C2, C3, C4 or C6,
- (c) item D2, D3, D5, or D6
- (d) item E4, or
- (e) item H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above. Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups. Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 7.5 for Manganese (dissolved):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

- (a) item B1
- (b) item C1, C3 or C4
- (c) item D2, D3, D5, or D6
- (d) item E4, or
- (e) item H3 or H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above. Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 7.6 for Sodium (dissolved):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Note 7.7 for Zinc (dissolved):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Note 7.8 for Chloride:

Standard to protect against taste and odour concerns.

Note 7.9 for Sulphate:

Standard to protect against taste and odour concerns.

Note 7.10 for Nitrate (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 7.13 for Aluminum (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 7.14 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 50 µg/L for chromium, hexavalent. Standard is 6000 µg/L for chromium, trivalent. The standard of 50 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

Note 7.15 for Copper (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 7.16 for Iron (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

- (a) item A6, A7, A8 or A11
- (b) item C1, C2, C3, C4 or C6,
- (c) item D2, D3, D5, or D6
- (d) item E4, or
- (e) item H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above. Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 7.17 for Manganese (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

- (a) item B1
- (b) item C1, C3 or C4
- (c) item D2, D3, D5, or D6
- (d) item E4, or
- (e) item H3 or H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above. Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 7.18 for Sodium (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Note 7.19 for Zinc (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Legend for Reports for RDOS Landfill and Wastewater Treatment Sites Water Quality Results

<	Less than reported detection limit
>	Greater than reported upper detection limit
>=	Greater than or equal to
A	Absent
BC SDWQG AO	BC Source Drinking Water Quality Guidelines - Aesthetic Objectives (2020 and updates)
BC SDWQG MAC	BC Source Drinking Water Quality Guidelines - Maximum Acceptable Concentrations (2020 and updates)
BCAWQG I	BC Approved Water Quality Guidelines for irrigation
BCWWQG I	BC Working Water Quality Guidelines for Irrigation (2020)
Calc	Calculated guideline or standard. The guideline or standard is dependent on the value of one or more other analytes, and is calculated from a formula or table.
CSR DW	BC CSR Generic Numerical Water Standards for Drinking Water
GCDWQ AO	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives
GCDWQ MAC	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations
L	Laboratory reading type (Lab result)
m asl	metres above sea level
N	Narrative type of guideline or standard, or Result Note.
ND	Non-detect. Result is less than lower detection limit.
NG	No Guideline
NR	No Result
NS	No Standard
NT	Not Tested
OG	Overgrown
P	Present
PR	Presumptive
TK	Test kit reading type (Field result)
TNTC	Too numerous to count
	Highlighted value has a lower detection limit that is greater than the guideline/standard maximum and/or the guideline/standard minimum, or has an upper detection limit that is less than the guideline/standard maximum and/or the guideline/standard minimum.
	The maximum guideline/standard value cannot be determined because a result for a dependent analyte is not available for the sample.
<u>BC SDWQG AO</u>	Highlighted value exceeds BC SDWQG AO
<u>BC SDWQG MAC</u>	Highlighted value exceeds BC SDWQG MAC
BCAWQG I	Highlighted value exceeds BCAWQG I
BCWWQG I	Highlighted value exceeds BCWWQG I
CSR DW	Highlighted value exceeds CSR DW
GCDWQ AO	Highlighted value exceeds GCDWQ AO
GCDWQ MAC	Highlighted value exceeds GCDWQ MAC
SL Criteria Override	Highlighted value exceeds sampling location criteria override

APPENDIX P

Offsite Wells along Hwy 97 Water Quality Monitoring 2021 Lab Reports



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9		
ATTENTION	Rob Palmer	WORK ORDER	2112161
PO NUMBER	Typical Landfill Drinking Water	RECEIVED / TEMP	2021-09-16 12:30 / 10°C
PROJECT	OK Falls - TLDW	REPORTED	2021-09-27 07:46
PROJECT INFO	1998 Hwy 97 (8066)	COC NUMBER	B095382

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.

Work Order Comments:

Custody Seals Intact: YES

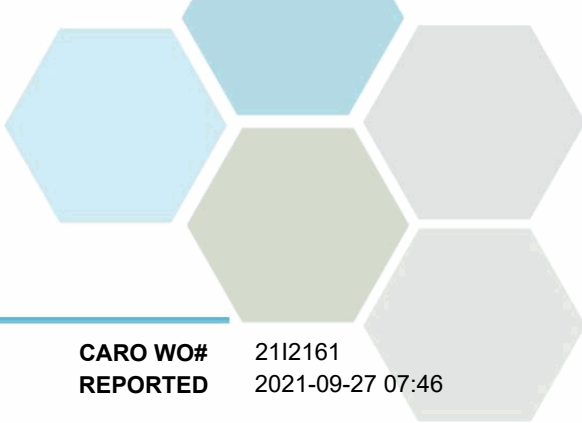
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

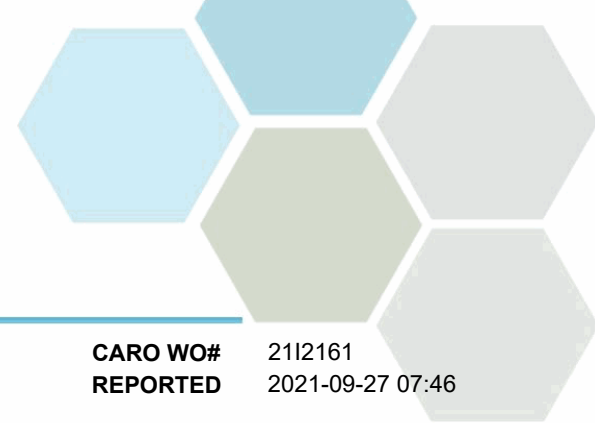


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112161
2021-09-27 07:46

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
1998 Hwy 97 (8066) (2112161-01) Matrix: Water Sampled: 2021-09-15 10:00					
Anions					
Bromide	0.25	N/A	0.10 mg/L	2021-09-16	
Chloride	143	AO ≤ 250	0.10 mg/L	2021-09-16	
Fluoride	2.51	MAC = 1.5	0.10 mg/L	2021-09-16	
Nitrate (as N)	1.40	MAC = 10	0.010 mg/L	2021-09-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-09-16	
Sulfate	159	AO ≤ 500	1.0 mg/L	2021-09-16	
Calculated Parameters					
Hardness, Total (as CaCO3)	180	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	1.40	N/A	0.0200 mg/L	N/A	
Dissolved Metals					
Aluminum, dissolved	0.0052	N/A	0.0050 mg/L	2021-09-24	
Antimony, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Arsenic, dissolved	0.0448	N/A	0.00050 mg/L	2021-09-24	
Barium, dissolved	0.0199	N/A	0.0050 mg/L	2021-09-24	
Beryllium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Bismuth, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Boron, dissolved	0.300	N/A	0.0500 mg/L	2021-09-24	
Cadmium, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-09-24	
Calcium, dissolved	42.1	N/A	0.20 mg/L	2021-09-24	
Chromium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-09-24	
Cobalt, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Copper, dissolved	0.00091	N/A	0.00040 mg/L	2021-09-24	
Iron, dissolved	< 0.010	N/A	0.010 mg/L	2021-09-24	
Lead, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Lithium, dissolved	0.0519	N/A	0.00010 mg/L	2021-09-24	
Magnesium, dissolved	18.2	N/A	0.010 mg/L	2021-09-24	
Manganese, dissolved	0.00093	N/A	0.00020 mg/L	2021-09-24	
Mercury, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-09-22	
Molybdenum, dissolved	0.0103	N/A	0.00010 mg/L	2021-09-24	
Nickel, dissolved	< 0.00040	N/A	0.00040 mg/L	2021-09-24	
Phosphorus, dissolved	< 0.050	N/A	0.050 mg/L	2021-09-24	
Potassium, dissolved	2.82	N/A	0.10 mg/L	2021-09-24	
Selenium, dissolved	0.00624	N/A	0.00050 mg/L	2021-09-24	
Silicon, dissolved	8.6	N/A	1.0 mg/L	2021-09-24	
Silver, dissolved	< 0.000050	N/A	0.000050 mg/L	2021-09-24	
Sodium, dissolved	174	N/A	0.10 mg/L	2021-09-24	
Strontium, dissolved	1.39	N/A	0.0010 mg/L	2021-09-24	
Sulfur, dissolved	55.9	N/A	3.0 mg/L	2021-09-24	
Tellurium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-09-24	
Thallium, dissolved	< 0.000020	N/A	0.000020 mg/L	2021-09-24	
Thorium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Tin, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Titanium, dissolved	< 0.0050	N/A	0.0050 mg/L	2021-09-24	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112161
2021-09-27 07:46

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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1998 Hwy 97 (8066) (2112161-01) | Matrix: Water | Sampled: 2021-09-15 10:00, Continued

Dissolved Metals, Continued

Tungsten, dissolved	< 0.0010	N/A	0.0010	mg/L	2021-09-24	
Uranium, dissolved	0.00544	N/A	0.000020	mg/L	2021-09-24	
Vanadium, dissolved	< 0.0010	N/A	0.0010	mg/L	2021-09-24	
Zinc, dissolved	< 0.0040	N/A	0.0040	mg/L	2021-09-24	
Zirconium, dissolved	< 0.00010	N/A	0.00010	mg/L	2021-09-24	

General Parameters

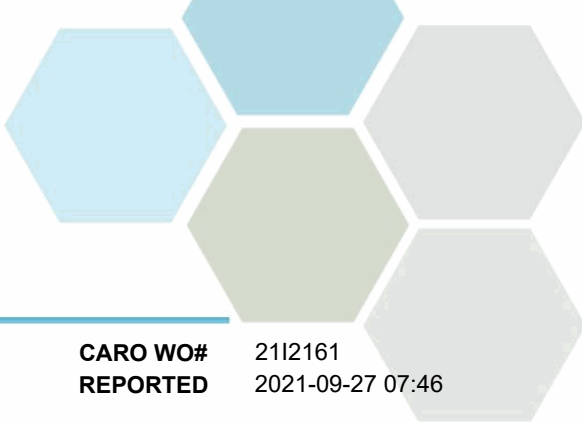
Alkalinity, Total (as CaCO3)	171	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Bicarbonate (as CaCO3)	171	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Bicarbonate (HCO3)	209	N/A	1.22	mg/L	N/A	
Carbonate (CO3)	< 0.600	N/A	0.600	mg/L	N/A	
Hydroxide (OH)	< 0.340	N/A	0.340	mg/L	N/A	
Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2021-09-18	
Chemical Oxygen Demand	5	N/A	20	mg/L	2021-09-19	
Conductivity (EC)	1130	N/A	2.0	µS/cm	2021-09-20	
pH	8.18	7.0-10.5	0.10	pH units	2021-09-20	HT2

Microbiological Parameters

Coliforms, Total	< 1	MAC = 0	1	CFU/100 mL	2021-09-16	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2021-09-16	

Total Metals

Aluminum, total	0.0078	OG < 0.1	0.0050	mg/L	2021-09-25	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2021-09-25	
Arsenic, total	0.0413	MAC = 0.01	0.00050	mg/L	2021-09-25	
Barium, total	0.0195	MAC = 2	0.0050	mg/L	2021-09-25	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Boron, total	0.294	MAC = 5	0.0500	mg/L	2021-09-25	
Cadmium, total	0.000011	MAC = 0.005	0.000010	mg/L	2021-09-25	
Calcium, total	40.4	None Required	0.20	mg/L	2021-09-25	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-09-25	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Copper, total	0.00111	MAC = 2	0.00040	mg/L	2021-09-25	
Iron, total	0.011	AO ≤ 0.3	0.010	mg/L	2021-09-25	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-09-25	
Lithium, total	0.0497	N/A	0.00010	mg/L	2021-09-25	
Magnesium, total	17.8	None Required	0.010	mg/L	2021-09-25	
Manganese, total	0.00103	MAC = 0.12	0.00020	mg/L	2021-09-25	
Mercury, total	< 0.000010	MAC = 0.001	0.000010	mg/L	2021-09-22	
Molybdenum, total	0.00996	N/A	0.00010	mg/L	2021-09-25	
Nickel, total	< 0.00040	N/A	0.00040	mg/L	2021-09-25	



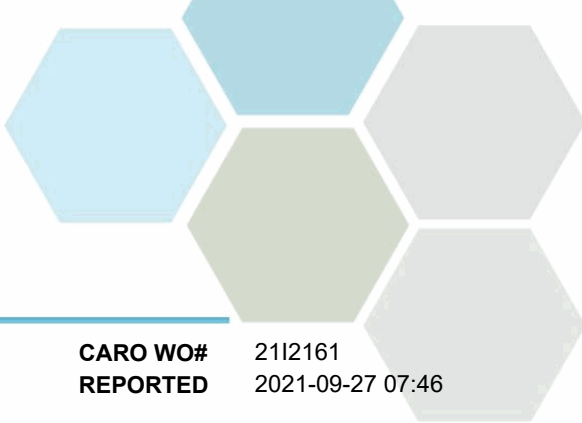
TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112161
2021-09-27 07:46

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
1998 Hwy 97 (8066) (2112161-01) Matrix: Water Sampled: 2021-09-15 10:00, Continued					
<i>Total Metals, Continued</i>					
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-09-25	
Potassium, total	2.64	N/A	0.10 mg/L	2021-09-25	
Selenium, total	0.00591	MAC = 0.05	0.00050 mg/L	2021-09-25	
Silicon, total	8.2	N/A	1.0 mg/L	2021-09-25	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-09-25	
Sodium, total	168	AO ≤ 200	0.10 mg/L	2021-09-25	
Strontium, total	1.27	7	0.0010 mg/L	2021-09-25	
Sulfur, total	54.0	N/A	3.0 mg/L	2021-09-25	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-09-25	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-09-25	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-25	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-09-25	
Titanium, total	0.0123	N/A	0.0050 mg/L	2021-09-25	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-09-25	
Uranium, total	0.00529	MAC = 0.02	0.000020 mg/L	2021-09-25	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-09-25	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-09-25	
Zirconium, total	0.00012	N/A	0.00010 mg/L	2021-09-25	

Sample Qualifiers:
 HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

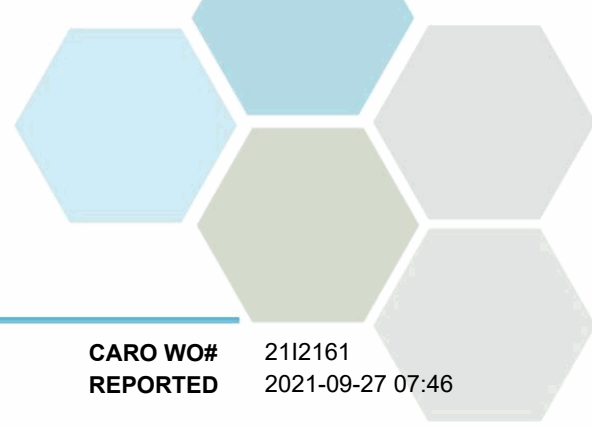
CARO WO# REPORTED 2112161
2021-09-27 07:46

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Coliforms, Total in Water	SM 9222* (2017)	Membrane Filtration / Chromocult Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond
E. coli in Water	SM 9222* (2017)	Membrane Filtration / Chromocult Agar	✓	Kelowna
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
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond

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
AO	Aesthetic Objective
CFU/100 mL	Colony Forming Units per 100 millilitres
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 Regional District of Okanagan Similkameen
PROJECT OK Falls - TLDW

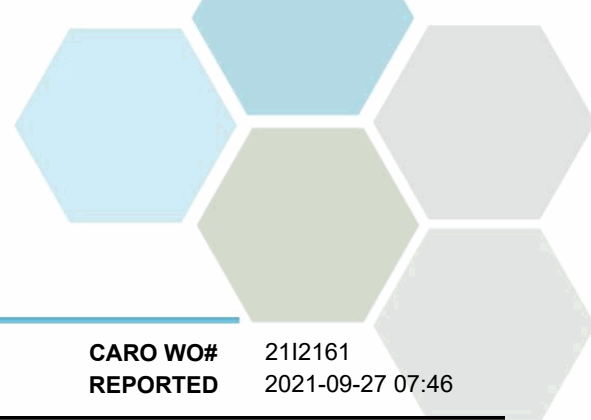
CARO WO# 2112161
REPORTED 2021-09-27 07:46

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: [{@Email}](#)

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



APPENDIX 2: QUALITY CONTROL RESULTS

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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:

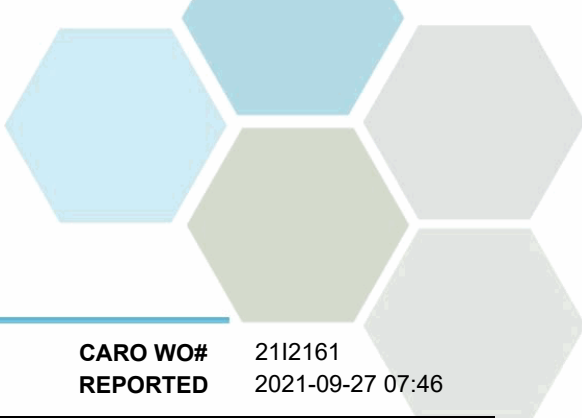
- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected 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 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	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B111794									
Blank (B111794-BLK1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	< 0.10	0.10 mg/L							
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 (B111794-BLK2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	< 0.10	0.10 mg/L							
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 (B111794-BS1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	3.95	0.10 mg/L	4.00		99	85-115			
Chloride	16.1	0.10 mg/L	16.0		100	90-110			
Fluoride	4.00	0.10 mg/L	4.00		100	88-108			
Nitrate (as N)	4.14	0.010 mg/L	4.00		103	90-110			
Nitrite (as N)	2.08	0.010 mg/L	2.00		104	85-115			
Sulfate	16.1	1.0 mg/L	16.0		100	90-110			
LCS (B111794-BS2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	4.08	0.10 mg/L	4.00		102	85-115			
Chloride	15.9	0.10 mg/L	16.0		99	90-110			
Fluoride	4.02	0.10 mg/L	4.00		101	88-108			
Nitrate (as N)	4.16	0.010 mg/L	4.00		104	90-110			
Nitrite (as N)	1.88	0.010 mg/L	2.00		94	85-115			
Sulfate	15.7	1.0 mg/L	16.0		98	90-110			

Dissolved Metals, Batch B112347

Blank (B112347-BLK1)			Prepared: 2021-09-24, Analyzed: 2021-09-24						
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							



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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
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Dissolved Metals, Batch B112347, Continued

Blank (B112347-BLK1), Continued

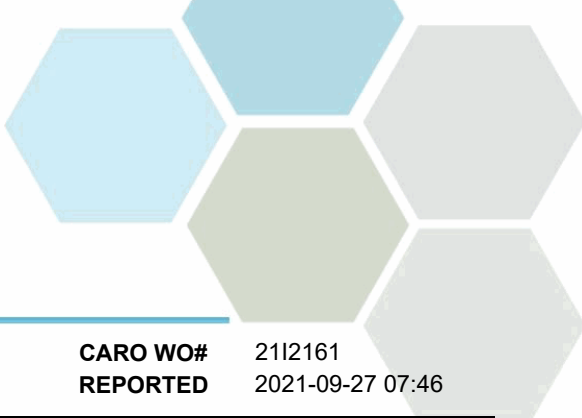
Prepared: 2021-09-24, Analyzed: 2021-09-24

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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							

Blank (B112347-BLK2)

Prepared: 2021-09-24, Analyzed: 2021-09-24

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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							



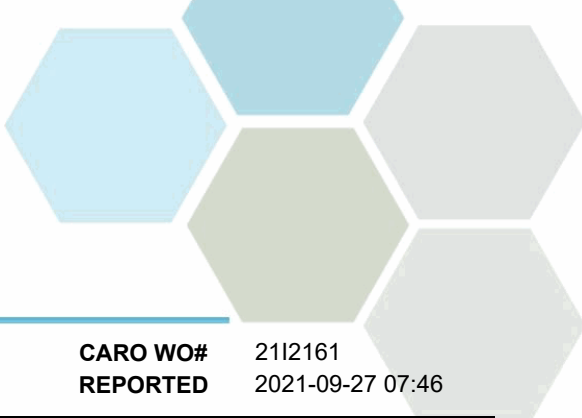
APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B112347, Continued									
Blank (B112347-BLK2), Continued					Prepared: 2021-09-24, Analyzed: 2021-09-24				
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							
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	0.0014	0.0010 mg/L							BLK
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

LCS (B112347-BS1)					Prepared: 2021-09-24, Analyzed: 2021-09-24				
Aluminum, dissolved	0.0226	0.0050 mg/L	0.0200		113	80-120			
Antimony, dissolved	0.0208	0.00020 mg/L	0.0200		104	80-120			
Arsenic, dissolved	0.0205	0.00050 mg/L	0.0200		103	80-120			
Barium, dissolved	0.0208	0.0050 mg/L	0.0200		104	80-120			
Beryllium, dissolved	0.0212	0.00010 mg/L	0.0200		106	80-120			
Bismuth, dissolved	0.0211	0.00010 mg/L	0.0200		106	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		102	80-120			
Cadmium, dissolved	0.0203	0.000010 mg/L	0.0200		102	80-120			
Calcium, dissolved, dissolved	1.89	0.20 mg/L	2.00		95	80-120			
Chromium, dissolved	0.0204	0.00050 mg/L	0.0200		102	80-120			
Cobalt, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Copper, dissolved	0.0217	0.00040 mg/L	0.0200		109	80-120			
Iron, dissolved	1.99	0.010 mg/L	2.00		99	80-120			
Lead, dissolved	0.0218	0.00020 mg/L	0.0200		109	80-120			
Lithium, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Magnesium, dissolved, dissolved	2.16	0.010 mg/L	2.00		108	80-120			
Manganese, dissolved	0.0234	0.00020 mg/L	0.0200		117	80-120			
Molybdenum, dissolved	0.0205	0.00010 mg/L	0.0200		102	80-120			
Nickel, dissolved	0.0209	0.00040 mg/L	0.0200		105	80-120			
Phosphorus, dissolved	2.08	0.050 mg/L	2.00		104	80-120			
Potassium, dissolved	2.02	0.10 mg/L	2.00		101	80-120			
Selenium, dissolved	0.0206	0.00050 mg/L	0.0200		103	80-120			
Silicon, dissolved	2.3	1.0 mg/L	2.00		115	80-120			
Silver, dissolved	0.0204	0.000050 mg/L	0.0200		102	80-120			
Sodium, dissolved	2.10	0.10 mg/L	2.00		105	80-120			
Strontium, dissolved	0.0200	0.0010 mg/L	0.0200		100	80-120			
Sulfur, dissolved	3.0	3.0 mg/L	2.50		118	80-120			
Tellurium, dissolved	0.0200	0.00050 mg/L	0.0200		100	80-120			
Thallium, dissolved	0.0213	0.000020 mg/L	0.0200		106	80-120			
Thorium, dissolved	0.0187	0.00010 mg/L	0.0200		94	80-120			
Tin, dissolved	0.0223	0.00020 mg/L	0.0200		112	80-120			
Titanium, dissolved	0.0216	0.0050 mg/L	0.0200		108	80-120			
Tungsten, dissolved	0.0206	0.0010 mg/L	0.0200		103	80-120			
Uranium, dissolved	0.0216	0.000020 mg/L	0.0200		108	80-120			
Vanadium, dissolved	0.0218	0.0010 mg/L	0.0200		109	80-120			
Zinc, dissolved	0.0196	0.0040 mg/L	0.0200		98	80-120			
Zirconium, dissolved	0.0206	0.00010 mg/L	0.0200		103	80-120			



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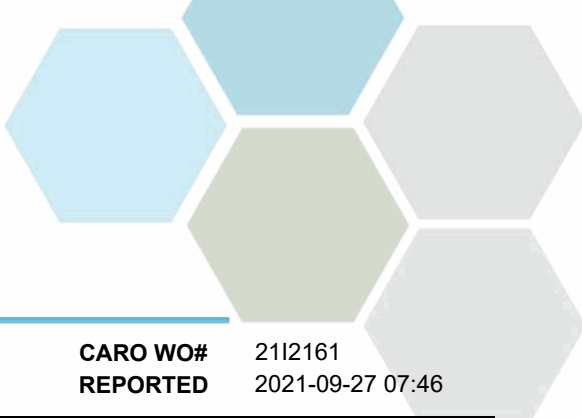
Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B112347, Continued									
Reference (B112347-SRM1)					Prepared: 2021-09-24, Analyzed: 2021-09-24				
Aluminum, dissolved	0.224	0.0050 mg/L	0.235		95	70-130			
Antimony, dissolved	0.0483	0.00020 mg/L	0.0431		112	70-130			
Arsenic, dissolved	0.452	0.00050 mg/L	0.423		107	70-130			
Barium, dissolved	3.26	0.0050 mg/L	3.30		99	70-130			
Beryllium, dissolved	0.218	0.00010 mg/L	0.209		104	70-130			
Boron, dissolved	1.73	0.0500 mg/L	1.65		105	70-130			
Cadmium, dissolved	0.223	0.000010 mg/L	0.221		101	70-130			
Calcium, dissolved, dissolved	7.61	0.20 mg/L	7.72		99	70-130			
Chromium, dissolved	0.435	0.00050 mg/L	0.434		100	70-130			
Cobalt, dissolved	0.130	0.00010 mg/L	0.124		105	70-130			
Copper, dissolved	0.873	0.00040 mg/L	0.815		107	70-130			
Iron, dissolved	1.27	0.010 mg/L	1.27		100	70-130			
Lead, dissolved	0.118	0.00020 mg/L	0.110		107	70-130			
Lithium, dissolved	0.108	0.00010 mg/L	0.100		108	70-130			
Magnesium, dissolved, dissolved	6.77	0.010 mg/L	6.59		103	70-130			
Manganese, dissolved	0.340	0.00020 mg/L	0.342		99	70-130			
Molybdenum, dissolved	0.428	0.00010 mg/L	0.404		106	70-130			
Nickel, dissolved	0.866	0.00040 mg/L	0.835		104	70-130			
Phosphorus, dissolved	0.482	0.050 mg/L	0.499		97	70-130			
Potassium, dissolved	2.91	0.10 mg/L	2.88		101	70-130			
Selenium, dissolved	0.0327	0.00050 mg/L	0.0324		101	70-130			
Sodium, dissolved	18.6	0.10 mg/L	18.0		103	70-130			
Strontium, dissolved	0.926	0.0010 mg/L	0.935		99	70-130			
Thallium, dissolved	0.0403	0.000020 mg/L	0.0385		105	70-130			
Uranium, dissolved	0.255	0.000020 mg/L	0.258		99	70-130			
Vanadium, dissolved	0.862	0.0010 mg/L	0.873		99	70-130			
Zinc, dissolved	0.831	0.0040 mg/L	0.848		98	70-130			

Dissolved Metals, Batch B112357

Blank (B112357-BLK1)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Blank (B112357-BLK2)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Reference (B112357-SRM1)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	0.00517	0.000010 mg/L	0.00581		89	70-130			
Reference (B112357-SRM2)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	0.00491	0.000010 mg/L	0.00581		85	70-130			

General Parameters, Batch B111980

Blank (B111980-BLK1)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK2)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK3)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK4)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							

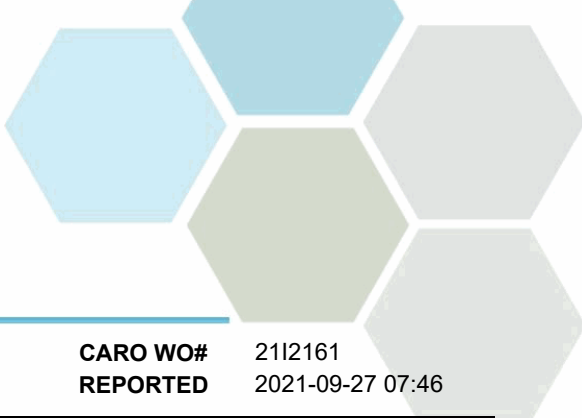


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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B111980, Continued									
LCS (B111980-BS1)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	1.01	0.050 mg/L	1.00		101	90-115			
LCS (B111980-BS2)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.964	0.050 mg/L	1.00		96	90-115			
LCS (B111980-BS3)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.974	0.050 mg/L	1.00		97	90-115			
LCS (B111980-BS4)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.988	0.050 mg/L	1.00		99	90-115			
General Parameters, Batch B112026									
Blank (B112026-BLK1)			Prepared: 2021-09-19, Analyzed: 2021-09-19						
Chemical Oxygen Demand	< 20	20 mg/L							
LCS (B112026-BS1)			Prepared: 2021-09-19, Analyzed: 2021-09-19						
Chemical Oxygen Demand	508	20 mg/L	500		102	89-115			
General Parameters, Batch B112171									
Blank (B112171-BLK1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BLK2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BLK3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BS1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	107	1.0 mg/L	100		107	80-120			
LCS (B112171-BS2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	110	1.0 mg/L	100		110	80-120			
LCS (B112171-BS3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	108	1.0 mg/L	100		108	80-120			
LCS (B112171-BS4)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1440	2.0 µS/cm	1410		102	95-105			



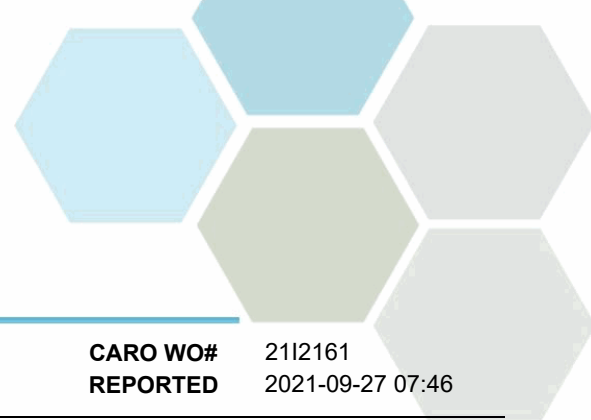
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112161
2021-09-27 07:46

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B112171, Continued									
LCS (B112171-BS5)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1430	2.0 µS/cm	1410		102	95-105			
LCS (B112171-BS6)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1450	2.0 µS/cm	1410		103	95-105			
Reference (B112171-SRM1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Reference (B112171-SRM2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Reference (B112171-SRM3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Microbiological Parameters, Batch B111739									
Blank (B111739-BLK1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK3)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK4)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK5)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK6)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Total Metals, Batch B112358									
Blank (B112358-BLK1)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B112358-BLK2)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	< 0.000010	0.000010 mg/L							
Reference (B112358-SRM1)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	0.00512	0.000010 mg/L	0.00581		88	70-130			
Reference (B112358-SRM2)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	0.00477	0.000010 mg/L	0.00581		82	70-130			

Total Metals, Batch B112443



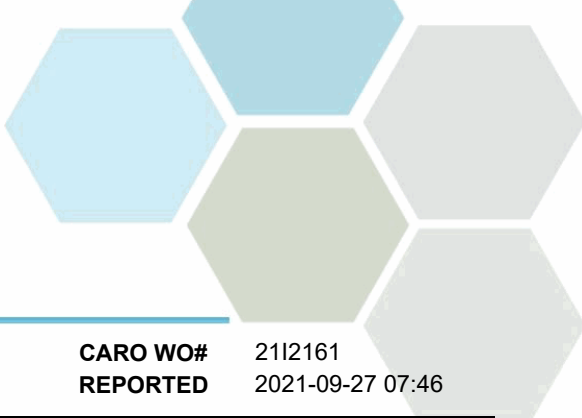
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112161
2021-09-27 07:46

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B112443, Continued									
Blank (B112443-BLK1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B112443-BS1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Aluminum, total	0.0226	0.0050 mg/L	0.0200		113	80-120			
Antimony, total	0.0209	0.00020 mg/L	0.0200		105	80-120			
Arsenic, total	0.0204	0.00050 mg/L	0.0200		102	80-120			
Barium, total	0.0221	0.0050 mg/L	0.0200		110	80-120			
Beryllium, total	0.0220	0.00010 mg/L	0.0200		110	80-120			
Bismuth, total	0.0219	0.00010 mg/L	0.0200		109	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		112	80-120			
Cadmium, total	0.0219	0.000010 mg/L	0.0200		109	80-120			
Calcium, total	2.09	0.20 mg/L	2.00		105	80-120			
Chromium, total	0.0228	0.00050 mg/L	0.0200		114	80-120			
Cobalt, total	0.0218	0.00010 mg/L	0.0200		109	80-120			
Copper, total	0.0225	0.00040 mg/L	0.0200		113	80-120			
Iron, total	2.26	0.010 mg/L	2.00		113	80-120			
Lead, total	0.0282	0.00020 mg/L	0.0200		141	80-120			SPK1
Lithium, total	0.0222	0.00010 mg/L	0.0200		111	80-120			
Magnesium, total	2.23	0.010 mg/L	2.00		111	80-120			
Manganese, total	0.0230	0.00020 mg/L	0.0200		115	80-120			

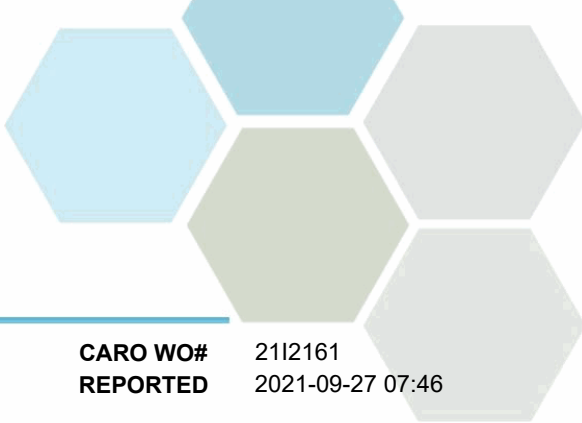


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112161
2021-09-27 07:46

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B112443, Continued									
LCS (B112443-BS1), Continued					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Molybdenum, total	0.0220	0.00010 mg/L	0.0200		110	80-120			
Nickel, total	0.0222	0.00040 mg/L	0.0200		111	80-120			
Phosphorus, total	2.16	0.050 mg/L	2.00		108	80-120			
Potassium, total	2.11	0.10 mg/L	2.00		105	80-120			
Selenium, total	0.0213	0.00050 mg/L	0.0200		107	80-120			
Silicon, total	2.3	1.0 mg/L	2.00		117	80-120			
Silver, total	0.0215	0.000050 mg/L	0.0200		108	80-120			
Sodium, total	2.17	0.10 mg/L	2.00		108	80-120			
Strontium, total	0.0236	0.0010 mg/L	0.0200		118	80-120			
Sulfur, total	< 3.0	3.0 mg/L	2.50		99	80-120			
Tellurium, total	0.0226	0.00050 mg/L	0.0200		113	80-120			
Thallium, total	0.0221	0.000020 mg/L	0.0200		111	80-120			
Thorium, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
Tin, total	0.0238	0.00020 mg/L	0.0200		119	80-120			
Titanium, total	0.0230	0.0050 mg/L	0.0200		115	80-120			
Tungsten, total	0.0213	0.0010 mg/L	0.0200		107	80-120			
Uranium, total	0.0228	0.000020 mg/L	0.0200		114	80-120			
Vanadium, total	0.0218	0.0010 mg/L	0.0200		109	80-120			
Zinc, total	0.0250	0.0040 mg/L	0.0200		125	80-120			SPK1
Zirconium, total	0.0219	0.00010 mg/L	0.0200		110	80-120			
Reference (B112443-SRM1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Aluminum, total	0.309	0.0050 mg/L	0.299		103	70-130			
Antimony, total	0.0569	0.00020 mg/L	0.0517		110	70-130			
Arsenic, total	0.131	0.00050 mg/L	0.119		110	70-130			
Barium, total	0.788	0.0050 mg/L	0.801		98	70-130			
Beryllium, total	0.0535	0.00010 mg/L	0.0501		107	70-130			
Boron, total	4.26	0.0500 mg/L	4.11		104	70-130			
Cadmium, total	0.0532	0.000010 mg/L	0.0503		106	70-130			
Calcium, total	10.4	0.20 mg/L	10.7		97	70-130			
Chromium, total	0.265	0.00050 mg/L	0.250		106	70-130			
Cobalt, total	0.0425	0.00010 mg/L	0.0384		111	70-130			
Copper, total	0.540	0.00040 mg/L	0.487		111	70-130			
Iron, total	0.532	0.010 mg/L	0.504		106	70-130			
Lead, total	0.322	0.00020 mg/L	0.278		116	70-130			
Lithium, total	0.442	0.00010 mg/L	0.398		111	70-130			
Magnesium, total	3.88	0.010 mg/L	3.59		108	70-130			
Manganese, total	0.114	0.00020 mg/L	0.111		102	70-130			
Molybdenum, total	0.220	0.00010 mg/L	0.196		112	70-130			
Nickel, total	0.270	0.00040 mg/L	0.248		109	70-130			
Phosphorus, total	0.245	0.050 mg/L	0.213		115	70-130			
Potassium, total	6.14	0.10 mg/L	5.89		104	70-130			
Selenium, total	0.129	0.00050 mg/L	0.120		108	70-130			
Sodium, total	9.35	0.10 mg/L	8.71		107	70-130			
Strontium, total	0.419	0.0010 mg/L	0.393		107	70-130			
Thallium, total	0.0886	0.000020 mg/L	0.0787		113	70-130			
Uranium, total	0.0387	0.000020 mg/L	0.0344		113	70-130			
Vanadium, total	0.407	0.0010 mg/L	0.391		104	70-130			
Zinc, total	2.51	0.0040 mg/L	2.50		100	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls - TLDW

CARO WO# 2112161
REPORTED 2021-09-27 07:46

QC Qualifiers:

BLK Analyte concentration in the Method Blank is above the Reporting Limit (RL).
SPK1 The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9		
ATTENTION	Rob Palmer	WORK ORDER	2112165
PO NUMBER	Typical Landfill Drinking Water	RECEIVED / TEMP	2021-09-16 12:30 / 10°C
PROJECT	OK Falls - TLDW	REPORTED	2021-09-27 07:42
PROJECT INFO	2126 Hwy 97 (7273)	COC NUMBER	B095382

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.

Work Order Comments:

Custody Seals Intact: YES

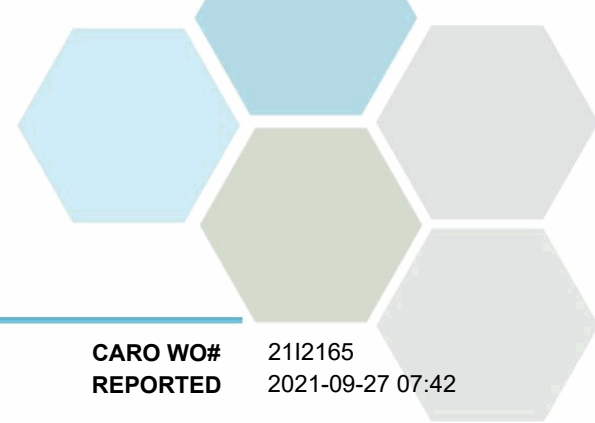
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

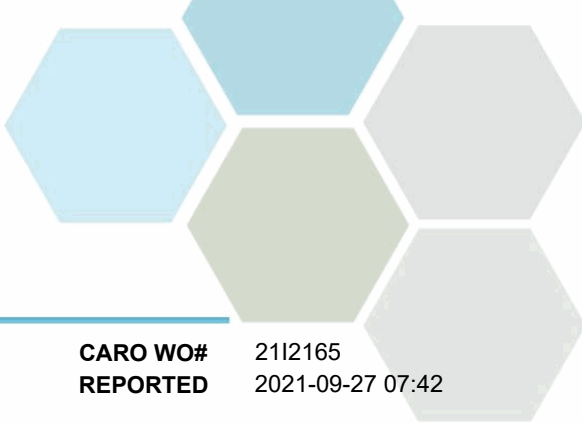


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112165
2021-09-27 07:42

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
2126 Hwy 97 (7273) (2112165-01) Matrix: Water Sampled: 2021-09-15 11:00					
Anions					
Bromide	< 0.10	N/A	0.10 mg/L	2021-09-16	
Chloride	103	AO ≤ 250	0.10 mg/L	2021-09-16	
Fluoride	2.01	MAC = 1.5	0.10 mg/L	2021-09-16	
Nitrate (as N)	1.46	MAC = 10	0.010 mg/L	2021-09-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-09-16	
Sulfate	98.7	AO ≤ 500	1.0 mg/L	2021-09-16	
Calculated Parameters					
Hardness, Total (as CaCO3)	335	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	1.46	N/A	0.0200 mg/L	N/A	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	N/A	0.0050 mg/L	2021-09-24	
Antimony, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Arsenic, dissolved	0.00075	N/A	0.00050 mg/L	2021-09-24	
Barium, dissolved	0.0325	N/A	0.0050 mg/L	2021-09-24	
Beryllium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Bismuth, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Boron, dissolved	0.114	N/A	0.0500 mg/L	2021-09-24	
Cadmium, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-09-24	
Calcium, dissolved	63.3	N/A	0.20 mg/L	2021-09-24	
Chromium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-09-24	
Cobalt, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Copper, dissolved	< 0.00040	N/A	0.00040 mg/L	2021-09-24	
Iron, dissolved	0.203	N/A	0.010 mg/L	2021-09-24	
Lead, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Lithium, dissolved	0.0138	N/A	0.00010 mg/L	2021-09-24	
Magnesium, dissolved	43.0	N/A	0.010 mg/L	2021-09-24	
Manganese, dissolved	0.0677	N/A	0.00020 mg/L	2021-09-24	
Mercury, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-09-22	
Molybdenum, dissolved	0.0184	N/A	0.00010 mg/L	2021-09-24	
Nickel, dissolved	0.00050	N/A	0.00040 mg/L	2021-09-24	
Phosphorus, dissolved	< 0.050	N/A	0.050 mg/L	2021-09-24	
Potassium, dissolved	5.43	N/A	0.10 mg/L	2021-09-24	
Selenium, dissolved	0.0125	N/A	0.00050 mg/L	2021-09-24	
Silicon, dissolved	8.9	N/A	1.0 mg/L	2021-09-24	
Silver, dissolved	< 0.000050	N/A	0.000050 mg/L	2021-09-24	
Sodium, dissolved	46.8	N/A	0.10 mg/L	2021-09-24	
Strontium, dissolved	1.61	N/A	0.0010 mg/L	2021-09-24	
Sulfur, dissolved	37.4	N/A	3.0 mg/L	2021-09-24	
Tellurium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-09-24	
Thallium, dissolved	< 0.000020	N/A	0.000020 mg/L	2021-09-24	
Thorium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Tin, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Titanium, dissolved	< 0.0050	N/A	0.0050 mg/L	2021-09-24	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112165
2021-09-27 07:42

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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2126 Hwy 97 (7273) (2112165-01) | Matrix: Water | Sampled: 2021-09-15 11:00, Continued

Dissolved Metals, Continued

Tungsten, dissolved	< 0.0010	N/A	0.0010	mg/L	2021-09-24	
Uranium, dissolved	0.00527	N/A	0.000020	mg/L	2021-09-24	
Vanadium, dissolved	< 0.0010	N/A	0.0010	mg/L	2021-09-24	
Zinc, dissolved	< 0.0040	N/A	0.0040	mg/L	2021-09-24	
Zirconium, dissolved	< 0.00010	N/A	0.00010	mg/L	2021-09-24	

General Parameters

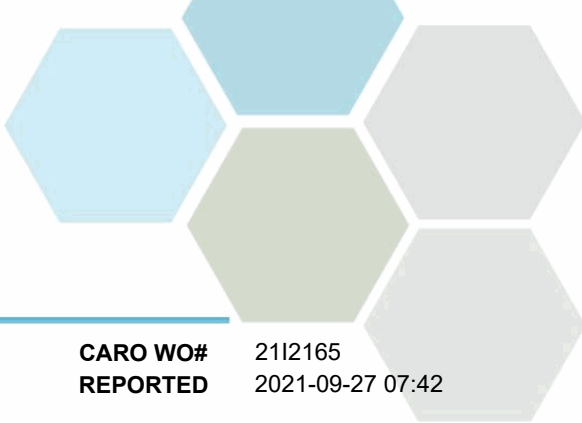
Alkalinity, Total (as CaCO3)	176	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Bicarbonate (as CaCO3)	176	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Bicarbonate (HCO3)	215	N/A	1.22	mg/L	N/A	
Carbonate (CO3)	< 0.600	N/A	0.600	mg/L	N/A	
Hydroxide (OH)	< 0.340	N/A	0.340	mg/L	N/A	
Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2021-09-18	
Chemical Oxygen Demand	< 5	N/A	20	mg/L	2021-09-19	
Conductivity (EC)	873	N/A	2.0	µS/cm	2021-09-20	
pH	8.15	7.0-10.5	0.10	pH units	2021-09-20	HT2

Microbiological Parameters

Coliforms, Total	≥ 2	MAC = 0	1	CFU/100 mL	2021-09-16	
Background Colonies	>200	N/A	200	CFU/100 mL	2021-09-16	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2021-09-16	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050	mg/L	2021-09-25	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2021-09-25	
Arsenic, total	0.00068	MAC = 0.01	0.00050	mg/L	2021-09-25	
Barium, total	0.0295	MAC = 2	0.0050	mg/L	2021-09-25	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Boron, total	0.106	MAC = 5	0.0500	mg/L	2021-09-25	
Cadmium, total	0.000018	MAC = 0.005	0.000010	mg/L	2021-09-25	
Calcium, total	57.9	None Required	0.20	mg/L	2021-09-25	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-09-25	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Copper, total	0.00117	MAC = 2	0.00040	mg/L	2021-09-25	
Iron, total	0.365	AO ≤ 0.3	0.010	mg/L	2021-09-25	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-09-25	
Lithium, total	0.0126	N/A	0.00010	mg/L	2021-09-25	
Magnesium, total	40.4	None Required	0.010	mg/L	2021-09-25	
Manganese, total	0.0693	MAC = 0.12	0.00020	mg/L	2021-09-25	
Mercury, total	< 0.000010	MAC = 0.001	0.000010	mg/L	2021-09-22	
Molybdenum, total	0.0167	N/A	0.00010	mg/L	2021-09-25	



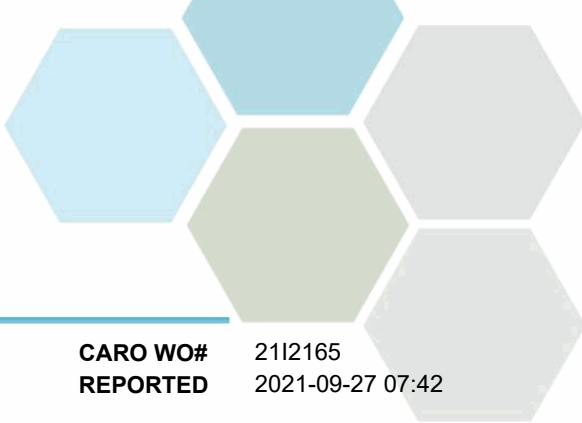
TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112165
2021-09-27 07:42

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
2126 Hwy 97 (7273) (2112165-01) Matrix: Water Sampled: 2021-09-15 11:00, Continued					
<i>Total Metals, Continued</i>					
Nickel, total	0.00044	N/A	0.00040 mg/L	2021-09-25	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-09-25	
Potassium, total	5.05	N/A	0.10 mg/L	2021-09-25	
Selenium, total	0.0111	MAC = 0.05	0.00050 mg/L	2021-09-25	
Silicon, total	8.1	N/A	1.0 mg/L	2021-09-25	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-09-25	
Sodium, total	43.5	AO ≤ 200	0.10 mg/L	2021-09-25	
Strontium, total	1.48	7	0.0010 mg/L	2021-09-25	
Sulfur, total	32.4	N/A	3.0 mg/L	2021-09-25	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-09-25	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-09-25	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-25	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-09-25	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-09-25	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-09-25	
Uranium, total	0.00474	MAC = 0.02	0.000020 mg/L	2021-09-25	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-09-25	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-09-25	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-25	

Sample Qualifiers:
HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
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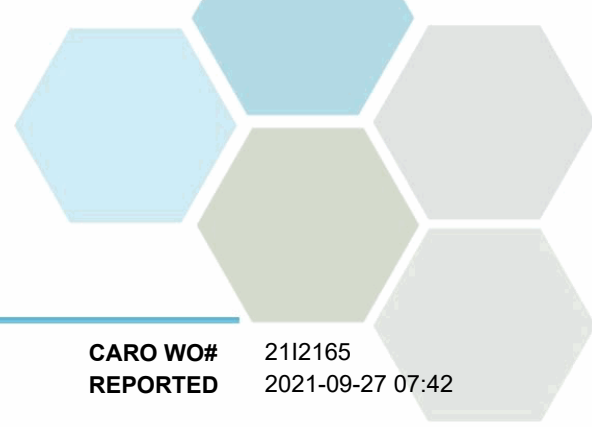
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2021-09-27 07:42

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Coliforms, Total in Water	SM 9222* (2017)	Membrane Filtration / Chromocult Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond
E. coli in Water	SM 9222* (2017)	Membrane Filtration / Chromocult Agar	✓	Kelowna
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
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond

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
>=	Greater than or equal to the specified Result
>2	Greater than the specified Result
AO	Aesthetic Objective
CFU/100 mL	Colony Forming Units per 100 millilitres
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 Regional District of Okanagan Similkameen
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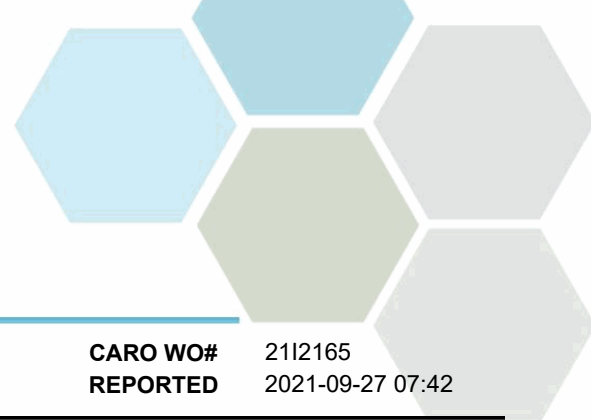
CARO WO# 2112165
REPORTED 2021-09-27 07:42

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: [{@Email}](#)

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



APPENDIX 2: QUALITY CONTROL RESULTS

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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:

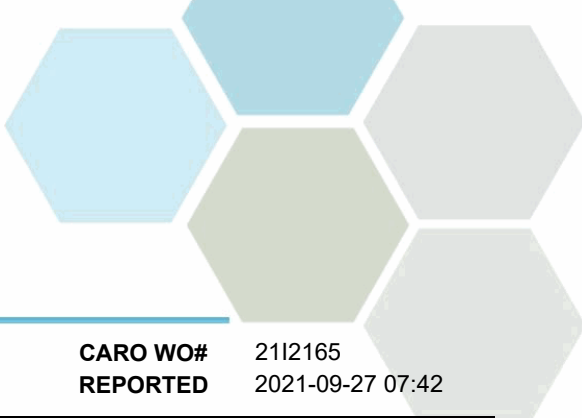
- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected 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 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	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B111794									
Blank (B111794-BLK1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	< 0.10	0.10 mg/L							
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 (B111794-BLK2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	< 0.10	0.10 mg/L							
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 (B111794-BS1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	3.95	0.10 mg/L	4.00		99	85-115			
Chloride	16.1	0.10 mg/L	16.0		100	90-110			
Fluoride	4.00	0.10 mg/L	4.00		100	88-108			
Nitrate (as N)	4.14	0.010 mg/L	4.00		103	90-110			
Nitrite (as N)	2.08	0.010 mg/L	2.00		104	85-115			
Sulfate	16.1	1.0 mg/L	16.0		100	90-110			
LCS (B111794-BS2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	4.08	0.10 mg/L	4.00		102	85-115			
Chloride	15.9	0.10 mg/L	16.0		99	90-110			
Fluoride	4.02	0.10 mg/L	4.00		101	88-108			
Nitrate (as N)	4.16	0.010 mg/L	4.00		104	90-110			
Nitrite (as N)	1.88	0.010 mg/L	2.00		94	85-115			
Sulfate	15.7	1.0 mg/L	16.0		98	90-110			

Dissolved Metals, Batch B112347

Blank (B112347-BLK1)			Prepared: 2021-09-24, Analyzed: 2021-09-24						
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
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Dissolved Metals, Batch B112347, Continued

Blank (B112347-BLK1), Continued

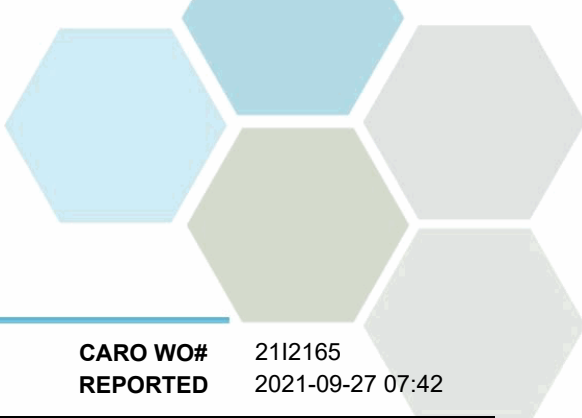
Prepared: 2021-09-24, Analyzed: 2021-09-24

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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							

Blank (B112347-BLK2)

Prepared: 2021-09-24, Analyzed: 2021-09-24

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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							



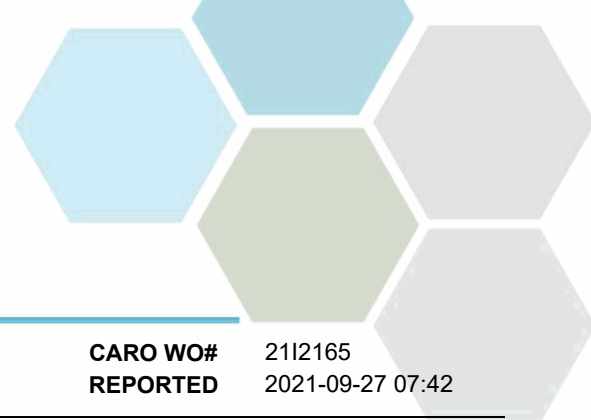
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112165
2021-09-27 07:42

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B112347, Continued									
Blank (B112347-BLK2), Continued					Prepared: 2021-09-24, Analyzed: 2021-09-24				
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							
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	0.0014	0.0010 mg/L							BLK
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

LCS (B112347-BS1)					Prepared: 2021-09-24, Analyzed: 2021-09-24				
Aluminum, dissolved	0.0226	0.0050 mg/L	0.0200		113	80-120			
Antimony, dissolved	0.0208	0.00020 mg/L	0.0200		104	80-120			
Arsenic, dissolved	0.0205	0.00050 mg/L	0.0200		103	80-120			
Barium, dissolved	0.0208	0.0050 mg/L	0.0200		104	80-120			
Beryllium, dissolved	0.0212	0.00010 mg/L	0.0200		106	80-120			
Bismuth, dissolved	0.0211	0.00010 mg/L	0.0200		106	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		102	80-120			
Cadmium, dissolved	0.0203	0.000010 mg/L	0.0200		102	80-120			
Calcium, dissolved, dissolved	1.89	0.20 mg/L	2.00		95	80-120			
Chromium, dissolved	0.0204	0.00050 mg/L	0.0200		102	80-120			
Cobalt, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Copper, dissolved	0.0217	0.00040 mg/L	0.0200		109	80-120			
Iron, dissolved	1.99	0.010 mg/L	2.00		99	80-120			
Lead, dissolved	0.0218	0.00020 mg/L	0.0200		109	80-120			
Lithium, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Magnesium, dissolved, dissolved	2.16	0.010 mg/L	2.00		108	80-120			
Manganese, dissolved	0.0234	0.00020 mg/L	0.0200		117	80-120			
Molybdenum, dissolved	0.0205	0.00010 mg/L	0.0200		102	80-120			
Nickel, dissolved	0.0209	0.00040 mg/L	0.0200		105	80-120			
Phosphorus, dissolved	2.08	0.050 mg/L	2.00		104	80-120			
Potassium, dissolved	2.02	0.10 mg/L	2.00		101	80-120			
Selenium, dissolved	0.0206	0.00050 mg/L	0.0200		103	80-120			
Silicon, dissolved	2.3	1.0 mg/L	2.00		115	80-120			
Silver, dissolved	0.0204	0.000050 mg/L	0.0200		102	80-120			
Sodium, dissolved	2.10	0.10 mg/L	2.00		105	80-120			
Strontium, dissolved	0.0200	0.0010 mg/L	0.0200		100	80-120			
Sulfur, dissolved	3.0	3.0 mg/L	2.50		118	80-120			
Tellurium, dissolved	0.0200	0.00050 mg/L	0.0200		100	80-120			
Thallium, dissolved	0.0213	0.000020 mg/L	0.0200		106	80-120			
Thorium, dissolved	0.0187	0.00010 mg/L	0.0200		94	80-120			
Tin, dissolved	0.0223	0.00020 mg/L	0.0200		112	80-120			
Titanium, dissolved	0.0216	0.0050 mg/L	0.0200		108	80-120			
Tungsten, dissolved	0.0206	0.0010 mg/L	0.0200		103	80-120			
Uranium, dissolved	0.0216	0.000020 mg/L	0.0200		108	80-120			
Vanadium, dissolved	0.0218	0.0010 mg/L	0.0200		109	80-120			
Zinc, dissolved	0.0196	0.0040 mg/L	0.0200		98	80-120			
Zirconium, dissolved	0.0206	0.00010 mg/L	0.0200		103	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
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CARO WO# REPORTED 2112165
2021-09-27 07:42

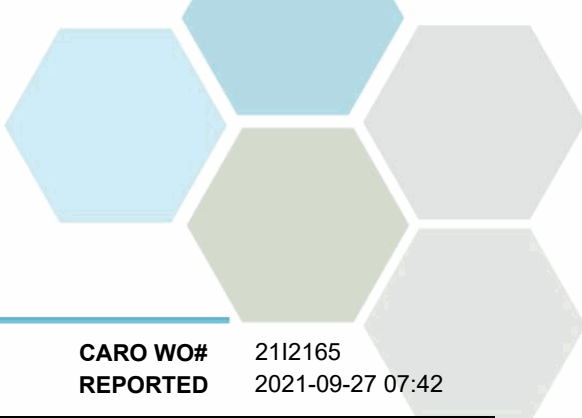
Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B112347, Continued									
Reference (B112347-SRM1)					Prepared: 2021-09-24, Analyzed: 2021-09-24				
Aluminum, dissolved	0.224	0.0050 mg/L	0.235		95	70-130			
Antimony, dissolved	0.0483	0.00020 mg/L	0.0431		112	70-130			
Arsenic, dissolved	0.452	0.00050 mg/L	0.423		107	70-130			
Barium, dissolved	3.26	0.0050 mg/L	3.30		99	70-130			
Beryllium, dissolved	0.218	0.00010 mg/L	0.209		104	70-130			
Boron, dissolved	1.73	0.0500 mg/L	1.65		105	70-130			
Cadmium, dissolved	0.223	0.000010 mg/L	0.221		101	70-130			
Calcium, dissolved, dissolved	7.61	0.20 mg/L	7.72		99	70-130			
Chromium, dissolved	0.435	0.00050 mg/L	0.434		100	70-130			
Cobalt, dissolved	0.130	0.00010 mg/L	0.124		105	70-130			
Copper, dissolved	0.873	0.00040 mg/L	0.815		107	70-130			
Iron, dissolved	1.27	0.010 mg/L	1.27		100	70-130			
Lead, dissolved	0.118	0.00020 mg/L	0.110		107	70-130			
Lithium, dissolved	0.108	0.00010 mg/L	0.100		108	70-130			
Magnesium, dissolved, dissolved	6.77	0.010 mg/L	6.59		103	70-130			
Manganese, dissolved	0.340	0.00020 mg/L	0.342		99	70-130			
Molybdenum, dissolved	0.428	0.00010 mg/L	0.404		106	70-130			
Nickel, dissolved	0.866	0.00040 mg/L	0.835		104	70-130			
Phosphorus, dissolved	0.482	0.050 mg/L	0.499		97	70-130			
Potassium, dissolved	2.91	0.10 mg/L	2.88		101	70-130			
Selenium, dissolved	0.0327	0.00050 mg/L	0.0324		101	70-130			
Sodium, dissolved	18.6	0.10 mg/L	18.0		103	70-130			
Strontium, dissolved	0.926	0.0010 mg/L	0.935		99	70-130			
Thallium, dissolved	0.0403	0.000020 mg/L	0.0385		105	70-130			
Uranium, dissolved	0.255	0.000020 mg/L	0.258		99	70-130			
Vanadium, dissolved	0.862	0.0010 mg/L	0.873		99	70-130			
Zinc, dissolved	0.831	0.0040 mg/L	0.848		98	70-130			

Dissolved Metals, Batch B112357

Blank (B112357-BLK1)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Blank (B112357-BLK2)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Reference (B112357-SRM1)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	0.00517	0.000010 mg/L	0.00581		89	70-130			
Reference (B112357-SRM2)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	0.00491	0.000010 mg/L	0.00581		85	70-130			

General Parameters, Batch B111980

Blank (B111980-BLK1)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK2)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK3)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK4)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							

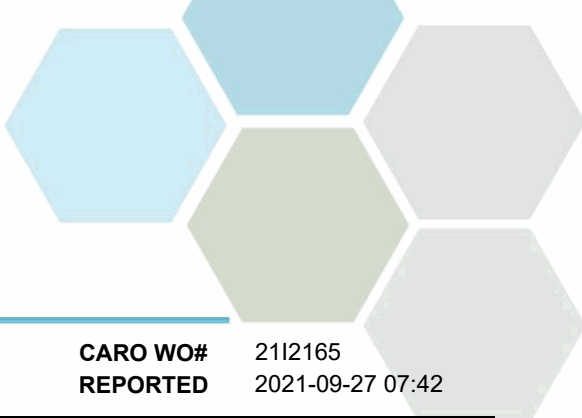


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112165
2021-09-27 07:42

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B111980, Continued									
LCS (B111980-BS1)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	1.01	0.050 mg/L	1.00		101	90-115			
LCS (B111980-BS2)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.964	0.050 mg/L	1.00		96	90-115			
LCS (B111980-BS3)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.974	0.050 mg/L	1.00		97	90-115			
LCS (B111980-BS4)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.988	0.050 mg/L	1.00		99	90-115			
General Parameters, Batch B112026									
Blank (B112026-BLK1)			Prepared: 2021-09-19, Analyzed: 2021-09-19						
Chemical Oxygen Demand	< 20	20 mg/L							
LCS (B112026-BS1)			Prepared: 2021-09-19, Analyzed: 2021-09-19						
Chemical Oxygen Demand	508	20 mg/L	500		102	89-115			
General Parameters, Batch B112171									
Blank (B112171-BLK1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BLK2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BLK3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BS1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	107	1.0 mg/L	100		107	80-120			
LCS (B112171-BS2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	110	1.0 mg/L	100		110	80-120			
LCS (B112171-BS3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	108	1.0 mg/L	100		108	80-120			
LCS (B112171-BS4)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1440	2.0 µS/cm	1410		102	95-105			

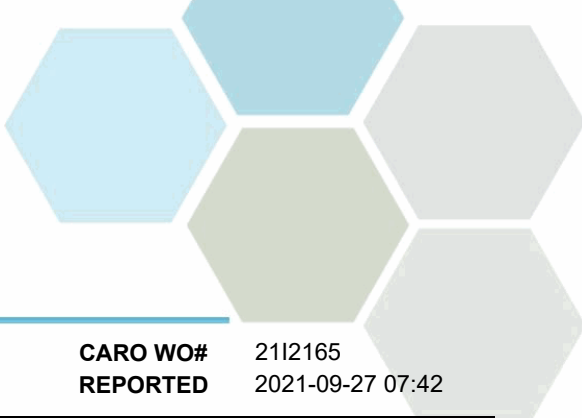


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112165
2021-09-27 07:42

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B112171, Continued									
LCS (B112171-BS5)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1430	2.0 µS/cm	1410		102	95-105			
LCS (B112171-BS6)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1450	2.0 µS/cm	1410		103	95-105			
Reference (B112171-SRM1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Reference (B112171-SRM2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Reference (B112171-SRM3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Microbiological Parameters, Batch B111739									
Blank (B111739-BLK1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK3)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK4)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK5)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK6)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Total Metals, Batch B112358									
Blank (B112358-BLK1)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B112358-BLK2)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	< 0.000010	0.000010 mg/L							
Reference (B112358-SRM1)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	0.00512	0.000010 mg/L	0.00581		88	70-130			
Reference (B112358-SRM2)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	0.00477	0.000010 mg/L	0.00581		82	70-130			
Total Metals, Batch B112443									



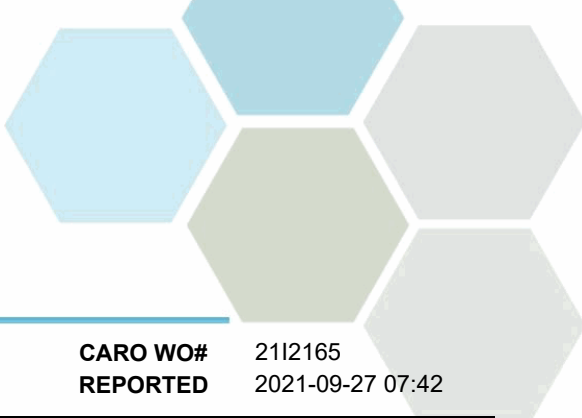
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112165
2021-09-27 07:42

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B112443, Continued									
Blank (B112443-BLK1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B112443-BS1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Aluminum, total	0.0226	0.0050 mg/L	0.0200		113	80-120			
Antimony, total	0.0209	0.00020 mg/L	0.0200		105	80-120			
Arsenic, total	0.0204	0.00050 mg/L	0.0200		102	80-120			
Barium, total	0.0221	0.0050 mg/L	0.0200		110	80-120			
Beryllium, total	0.0220	0.00010 mg/L	0.0200		110	80-120			
Bismuth, total	0.0219	0.00010 mg/L	0.0200		109	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		112	80-120			
Cadmium, total	0.0219	0.000010 mg/L	0.0200		109	80-120			
Calcium, total	2.09	0.20 mg/L	2.00		105	80-120			
Chromium, total	0.0228	0.00050 mg/L	0.0200		114	80-120			
Cobalt, total	0.0218	0.00010 mg/L	0.0200		109	80-120			
Copper, total	0.0225	0.00040 mg/L	0.0200		113	80-120			
Iron, total	2.26	0.010 mg/L	2.00		113	80-120			
Lead, total	0.0282	0.00020 mg/L	0.0200		141	80-120			SPK1
Lithium, total	0.0222	0.00010 mg/L	0.0200		111	80-120			
Magnesium, total	2.23	0.010 mg/L	2.00		111	80-120			
Manganese, total	0.0230	0.00020 mg/L	0.0200		115	80-120			

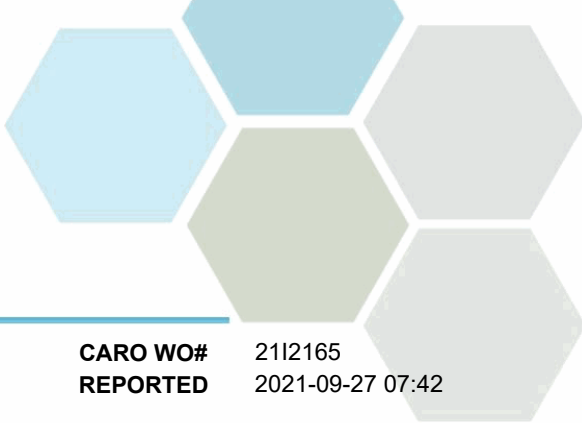


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112165
2021-09-27 07:42

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B112443, Continued									
LCS (B112443-BS1), Continued					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Molybdenum, total	0.0220	0.00010 mg/L	0.0200		110	80-120			
Nickel, total	0.0222	0.00040 mg/L	0.0200		111	80-120			
Phosphorus, total	2.16	0.050 mg/L	2.00		108	80-120			
Potassium, total	2.11	0.10 mg/L	2.00		105	80-120			
Selenium, total	0.0213	0.00050 mg/L	0.0200		107	80-120			
Silicon, total	2.3	1.0 mg/L	2.00		117	80-120			
Silver, total	0.0215	0.000050 mg/L	0.0200		108	80-120			
Sodium, total	2.17	0.10 mg/L	2.00		108	80-120			
Strontium, total	0.0236	0.0010 mg/L	0.0200		118	80-120			
Sulfur, total	< 3.0	3.0 mg/L	2.50		99	80-120			
Tellurium, total	0.0226	0.00050 mg/L	0.0200		113	80-120			
Thallium, total	0.0221	0.000020 mg/L	0.0200		111	80-120			
Thorium, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
Tin, total	0.0238	0.00020 mg/L	0.0200		119	80-120			
Titanium, total	0.0230	0.0050 mg/L	0.0200		115	80-120			
Tungsten, total	0.0213	0.0010 mg/L	0.0200		107	80-120			
Uranium, total	0.0228	0.000020 mg/L	0.0200		114	80-120			
Vanadium, total	0.0218	0.0010 mg/L	0.0200		109	80-120			
Zinc, total	0.0250	0.0040 mg/L	0.0200		125	80-120			SPK1
Zirconium, total	0.0219	0.00010 mg/L	0.0200		110	80-120			
Reference (B112443-SRM1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Aluminum, total	0.309	0.0050 mg/L	0.299		103	70-130			
Antimony, total	0.0569	0.00020 mg/L	0.0517		110	70-130			
Arsenic, total	0.131	0.00050 mg/L	0.119		110	70-130			
Barium, total	0.788	0.0050 mg/L	0.801		98	70-130			
Beryllium, total	0.0535	0.00010 mg/L	0.0501		107	70-130			
Boron, total	4.26	0.0500 mg/L	4.11		104	70-130			
Cadmium, total	0.0532	0.000010 mg/L	0.0503		106	70-130			
Calcium, total	10.4	0.20 mg/L	10.7		97	70-130			
Chromium, total	0.265	0.00050 mg/L	0.250		106	70-130			
Cobalt, total	0.0425	0.00010 mg/L	0.0384		111	70-130			
Copper, total	0.540	0.00040 mg/L	0.487		111	70-130			
Iron, total	0.532	0.010 mg/L	0.504		106	70-130			
Lead, total	0.322	0.00020 mg/L	0.278		116	70-130			
Lithium, total	0.442	0.00010 mg/L	0.398		111	70-130			
Magnesium, total	3.88	0.010 mg/L	3.59		108	70-130			
Manganese, total	0.114	0.00020 mg/L	0.111		102	70-130			
Molybdenum, total	0.220	0.00010 mg/L	0.196		112	70-130			
Nickel, total	0.270	0.00040 mg/L	0.248		109	70-130			
Phosphorus, total	0.245	0.050 mg/L	0.213		115	70-130			
Potassium, total	6.14	0.10 mg/L	5.89		104	70-130			
Selenium, total	0.129	0.00050 mg/L	0.120		108	70-130			
Sodium, total	9.35	0.10 mg/L	8.71		107	70-130			
Strontium, total	0.419	0.0010 mg/L	0.393		107	70-130			
Thallium, total	0.0886	0.000020 mg/L	0.0787		113	70-130			
Uranium, total	0.0387	0.000020 mg/L	0.0344		113	70-130			
Vanadium, total	0.407	0.0010 mg/L	0.391		104	70-130			
Zinc, total	2.51	0.0040 mg/L	2.50		100	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls - TLDW

CARO WO# 2112165
REPORTED 2021-09-27 07:42

QC Qualifiers:

BLK Analyte concentration in the Method Blank is above the Reporting Limit (RL).
SPK1 The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2112166
ATTENTION	Rob Palmer	RECEIVED / TEMP REPORTED	2021-09-16 12:30 / 10.4°C 2021-09-27 07:37
PO NUMBER	Typical Landfill Groundwater	COC NUMBER	B095382
PROJECT	Ok Falls - TLGW		
PROJECT INFO	2150A Hwy 97 (7274)		

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.

Work Order Comments:

Custody Seals Intact: YES

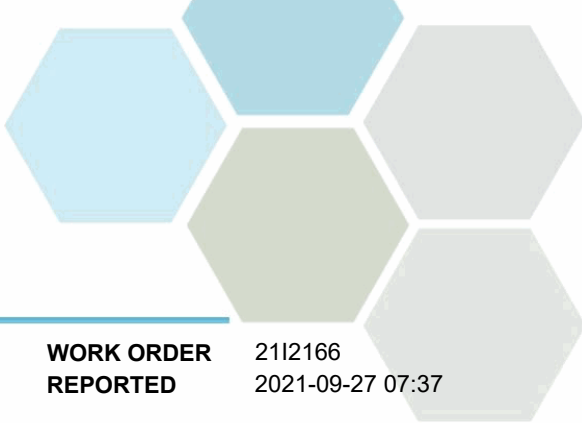
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
Ok Falls - TLGW

WORK ORDER REPORTED 2112166
2021-09-27 07:37

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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2150A Hwy 97 (7274) (2112166-01) | Matrix: Water | Sampled: 2021-09-15 11:45

Anions

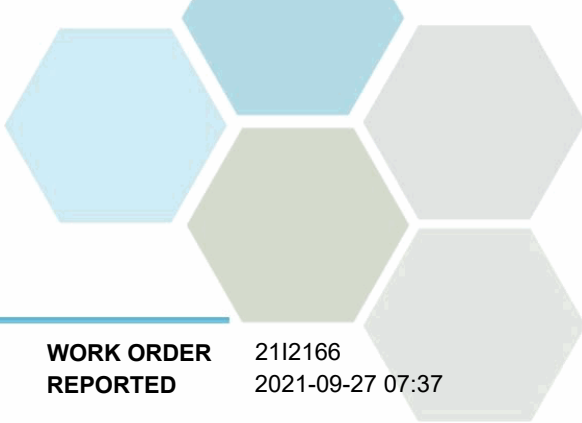
Bromide	< 0.10	N/A	0.10 mg/L	2021-09-16	
Chloride	8.79	AO ≤ 250	0.10 mg/L	2021-09-16	
Fluoride	0.38	MAC = 1.5	0.10 mg/L	2021-09-16	
Nitrate (as N)	0.832	MAC = 10	0.010 mg/L	2021-09-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-09-16	
Sulfate	59.2	AO ≤ 500	1.0 mg/L	2021-09-16	

Calculated Parameters

Hardness, Total (as CaCO3)	232	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	0.832	N/A	0.0200 mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	0.187	N/A	0.0050 mg/L	2021-09-24	
Antimony, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Arsenic, dissolved	0.00237	N/A	0.00050 mg/L	2021-09-24	
Barium, dissolved	0.162	N/A	0.0050 mg/L	2021-09-24	
Beryllium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Bismuth, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Boron, dissolved	< 0.0500	N/A	0.0500 mg/L	2021-09-24	
Cadmium, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-09-24	
Calcium, dissolved	69.3	N/A	0.20 mg/L	2021-09-24	
Chromium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-09-24	
Cobalt, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Copper, dissolved	0.00052	N/A	0.00040 mg/L	2021-09-24	
Iron, dissolved	0.082	N/A	0.010 mg/L	2021-09-24	
Lead, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Lithium, dissolved	0.00570	N/A	0.00010 mg/L	2021-09-24	
Magnesium, dissolved	14.3	N/A	0.010 mg/L	2021-09-24	
Manganese, dissolved	0.0907	N/A	0.00020 mg/L	2021-09-24	
Mercury, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-09-22	
Molybdenum, dissolved	0.00252	N/A	0.00010 mg/L	2021-09-24	
Nickel, dissolved	< 0.00040	N/A	0.00040 mg/L	2021-09-24	
Phosphorus, dissolved	< 0.050	N/A	0.050 mg/L	2021-09-24	
Potassium, dissolved	3.43	N/A	0.10 mg/L	2021-09-24	
Selenium, dissolved	0.00123	N/A	0.00050 mg/L	2021-09-24	
Silicon, dissolved	11.3	N/A	1.0 mg/L	2021-09-24	
Silver, dissolved	< 0.000050	N/A	0.000050 mg/L	2021-09-24	
Sodium, dissolved	9.42	N/A	0.10 mg/L	2021-09-24	
Strontium, dissolved	0.654	N/A	0.0010 mg/L	2021-09-24	
Sulfur, dissolved	20.1	N/A	3.0 mg/L	2021-09-24	
Tellurium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-09-24	
Thallium, dissolved	< 0.000020	N/A	0.000020 mg/L	2021-09-24	
Thorium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Tin, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	



TEST RESULTS

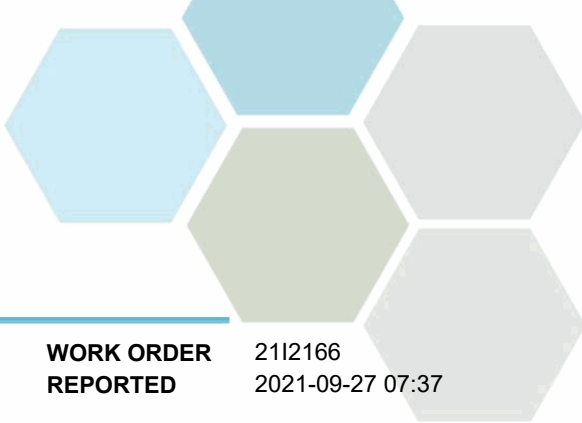
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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
2150A Hwy 97 (7274) (2112166-01) Matrix: Water Sampled: 2021-09-15 11:45, Continued					
<i>Dissolved Metals, Continued</i>					
Titanium, dissolved	< 0.0050	N/A	0.0050 mg/L	2021-09-24	
Tungsten, dissolved	< 0.0010	N/A	0.0010 mg/L	2021-09-24	
Uranium, dissolved	0.00204	N/A	0.000020 mg/L	2021-09-24	
Vanadium, dissolved	< 0.0010	N/A	0.0010 mg/L	2021-09-24	
Zinc, dissolved	< 0.0040	N/A	0.0040 mg/L	2021-09-24	
Zirconium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
<i>General Parameters</i>					
Alkalinity, Total (as CaCO ₃)	185	N/A	1.0 mg/L	2021-09-20	
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2021-09-20	
Alkalinity, Bicarbonate (as CaCO ₃)	185	N/A	1.0 mg/L	2021-09-20	
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2021-09-20	
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2021-09-20	
Bicarbonate (HCO ₃)	226	N/A	1.22 mg/L	N/A	
Carbonate (CO ₃)	< 0.600	N/A	0.600 mg/L	N/A	
Hydroxide (OH)	< 0.340	N/A	0.340 mg/L	N/A	
Ammonia, Total (as N)	< 0.050	None Required	0.050 mg/L	2021-09-18	
Chemical Oxygen Demand	< 5	N/A	20 mg/L	2021-09-19	
Conductivity (EC)	468	N/A	2.0 µS/cm	2021-09-20	
pH	8.17	7.0-10.5	0.10 pH units	2021-09-20	HT2

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

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Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	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
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna

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

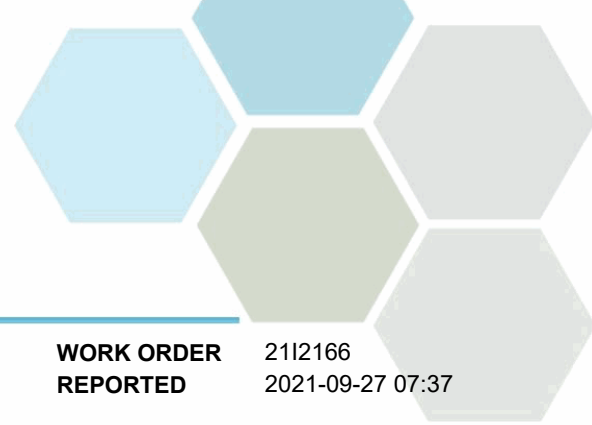
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

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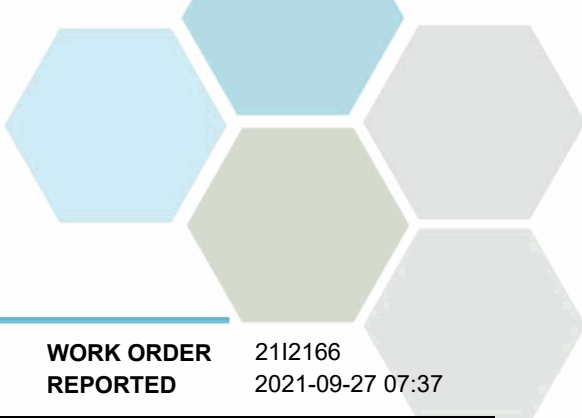
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General Comments:

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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

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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:

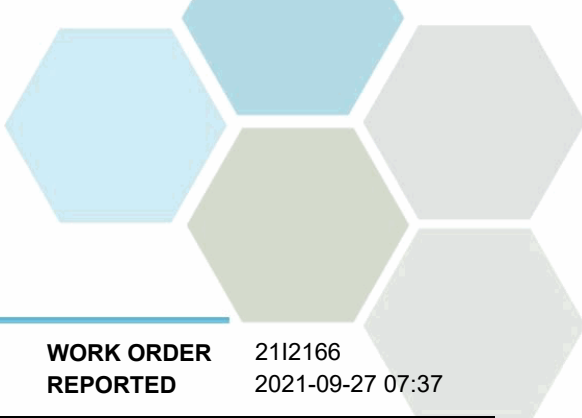
- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected 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 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
Anions, Batch B111794									
Blank (B111794-BLK1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	< 0.10	0.10 mg/L							
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 (B111794-BLK2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	< 0.10	0.10 mg/L							
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 (B111794-BS1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	3.95	0.10 mg/L	4.00		99	85-115			
Chloride	16.1	0.10 mg/L	16.0		100	90-110			
Fluoride	4.00	0.10 mg/L	4.00		100	88-108			
Nitrate (as N)	4.14	0.010 mg/L	4.00		103	90-110			
Nitrite (as N)	2.08	0.010 mg/L	2.00		104	85-115			
Sulfate	16.1	1.0 mg/L	16.0		100	90-110			
LCS (B111794-BS2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	4.08	0.10 mg/L	4.00		102	85-115			
Chloride	15.9	0.10 mg/L	16.0		99	90-110			
Fluoride	4.02	0.10 mg/L	4.00		101	88-108			
Nitrate (as N)	4.16	0.010 mg/L	4.00		104	90-110			
Nitrite (as N)	1.88	0.010 mg/L	2.00		94	85-115			
Sulfate	15.7	1.0 mg/L	16.0		98	90-110			

Dissolved Metals, Batch B112347

Blank (B112347-BLK1)			Prepared: 2021-09-24, Analyzed: 2021-09-24						
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Dissolved Metals, Batch B112347, Continued

Blank (B112347-BLK1), Continued

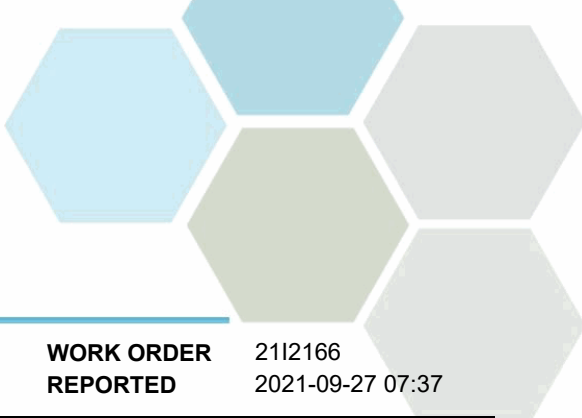
Prepared: 2021-09-24, Analyzed: 2021-09-24

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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							

Blank (B112347-BLK2)

Prepared: 2021-09-24, Analyzed: 2021-09-24

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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							



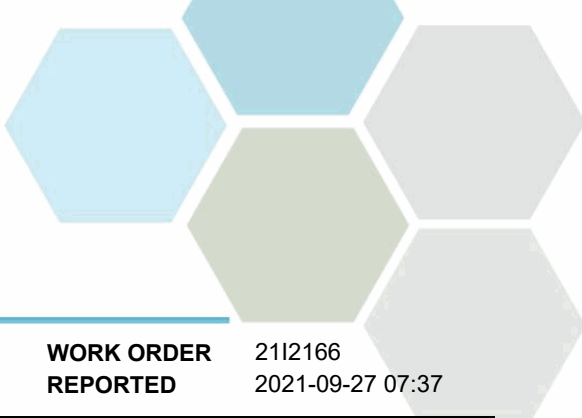
APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B112347, Continued									
Blank (B112347-BLK2), Continued					Prepared: 2021-09-24, Analyzed: 2021-09-24				
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							
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	0.0014	0.0010 mg/L							BLK
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

LCS (B112347-BS1)					Prepared: 2021-09-24, Analyzed: 2021-09-24				
Aluminum, dissolved	0.0226	0.0050 mg/L	0.0200		113	80-120			
Antimony, dissolved	0.0208	0.00020 mg/L	0.0200		104	80-120			
Arsenic, dissolved	0.0205	0.00050 mg/L	0.0200		103	80-120			
Barium, dissolved	0.0208	0.0050 mg/L	0.0200		104	80-120			
Beryllium, dissolved	0.0212	0.00010 mg/L	0.0200		106	80-120			
Bismuth, dissolved	0.0211	0.00010 mg/L	0.0200		106	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		102	80-120			
Cadmium, dissolved	0.0203	0.000010 mg/L	0.0200		102	80-120			
Calcium, dissolved, dissolved	1.89	0.20 mg/L	2.00		95	80-120			
Chromium, dissolved	0.0204	0.00050 mg/L	0.0200		102	80-120			
Cobalt, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Copper, dissolved	0.0217	0.00040 mg/L	0.0200		109	80-120			
Iron, dissolved	1.99	0.010 mg/L	2.00		99	80-120			
Lead, dissolved	0.0218	0.00020 mg/L	0.0200		109	80-120			
Lithium, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Magnesium, dissolved, dissolved	2.16	0.010 mg/L	2.00		108	80-120			
Manganese, dissolved	0.0234	0.00020 mg/L	0.0200		117	80-120			
Molybdenum, dissolved	0.0205	0.00010 mg/L	0.0200		102	80-120			
Nickel, dissolved	0.0209	0.00040 mg/L	0.0200		105	80-120			
Phosphorus, dissolved	2.08	0.050 mg/L	2.00		104	80-120			
Potassium, dissolved	2.02	0.10 mg/L	2.00		101	80-120			
Selenium, dissolved	0.0206	0.00050 mg/L	0.0200		103	80-120			
Silicon, dissolved	2.3	1.0 mg/L	2.00		115	80-120			
Silver, dissolved	0.0204	0.000050 mg/L	0.0200		102	80-120			
Sodium, dissolved	2.10	0.10 mg/L	2.00		105	80-120			
Strontium, dissolved	0.0200	0.0010 mg/L	0.0200		100	80-120			
Sulfur, dissolved	3.0	3.0 mg/L	2.50		118	80-120			
Tellurium, dissolved	0.0200	0.00050 mg/L	0.0200		100	80-120			
Thallium, dissolved	0.0213	0.000020 mg/L	0.0200		106	80-120			
Thorium, dissolved	0.0187	0.00010 mg/L	0.0200		94	80-120			
Tin, dissolved	0.0223	0.00020 mg/L	0.0200		112	80-120			
Titanium, dissolved	0.0216	0.0050 mg/L	0.0200		108	80-120			
Tungsten, dissolved	0.0206	0.0010 mg/L	0.0200		103	80-120			
Uranium, dissolved	0.0216	0.000020 mg/L	0.0200		108	80-120			
Vanadium, dissolved	0.0218	0.0010 mg/L	0.0200		109	80-120			
Zinc, dissolved	0.0196	0.0040 mg/L	0.0200		98	80-120			
Zirconium, dissolved	0.0206	0.00010 mg/L	0.0200		103	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

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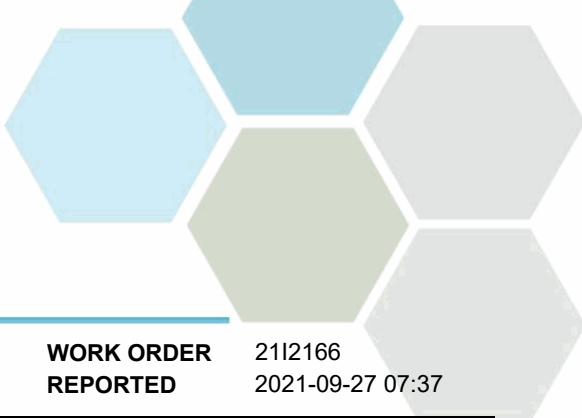
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B112347, Continued									
Reference (B112347-SRM1)					Prepared: 2021-09-24, Analyzed: 2021-09-24				
Aluminum, dissolved	0.224	0.0050 mg/L	0.235		95	70-130			
Antimony, dissolved	0.0483	0.00020 mg/L	0.0431		112	70-130			
Arsenic, dissolved	0.452	0.00050 mg/L	0.423		107	70-130			
Barium, dissolved	3.26	0.0050 mg/L	3.30		99	70-130			
Beryllium, dissolved	0.218	0.00010 mg/L	0.209		104	70-130			
Boron, dissolved	1.73	0.0500 mg/L	1.65		105	70-130			
Cadmium, dissolved	0.223	0.000010 mg/L	0.221		101	70-130			
Calcium, dissolved, dissolved	7.61	0.20 mg/L	7.72		99	70-130			
Chromium, dissolved	0.435	0.00050 mg/L	0.434		100	70-130			
Cobalt, dissolved	0.130	0.00010 mg/L	0.124		105	70-130			
Copper, dissolved	0.873	0.00040 mg/L	0.815		107	70-130			
Iron, dissolved	1.27	0.010 mg/L	1.27		100	70-130			
Lead, dissolved	0.118	0.00020 mg/L	0.110		107	70-130			
Lithium, dissolved	0.108	0.00010 mg/L	0.100		108	70-130			
Magnesium, dissolved, dissolved	6.77	0.010 mg/L	6.59		103	70-130			
Manganese, dissolved	0.340	0.00020 mg/L	0.342		99	70-130			
Molybdenum, dissolved	0.428	0.00010 mg/L	0.404		106	70-130			
Nickel, dissolved	0.866	0.00040 mg/L	0.835		104	70-130			
Phosphorus, dissolved	0.482	0.050 mg/L	0.499		97	70-130			
Potassium, dissolved	2.91	0.10 mg/L	2.88		101	70-130			
Selenium, dissolved	0.0327	0.00050 mg/L	0.0324		101	70-130			
Sodium, dissolved	18.6	0.10 mg/L	18.0		103	70-130			
Strontium, dissolved	0.926	0.0010 mg/L	0.935		99	70-130			
Thallium, dissolved	0.0403	0.000020 mg/L	0.0385		105	70-130			
Uranium, dissolved	0.255	0.000020 mg/L	0.258		99	70-130			
Vanadium, dissolved	0.862	0.0010 mg/L	0.873		99	70-130			
Zinc, dissolved	0.831	0.0040 mg/L	0.848		98	70-130			

Dissolved Metals, Batch B112357

Blank (B112357-BLK1)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Blank (B112357-BLK2)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Reference (B112357-SRM1)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	0.00517	0.000010 mg/L	0.00581		89	70-130			
Reference (B112357-SRM2)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	0.00491	0.000010 mg/L	0.00581		85	70-130			

General Parameters, Batch B111980

Blank (B111980-BLK1)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK2)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK3)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK4)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							

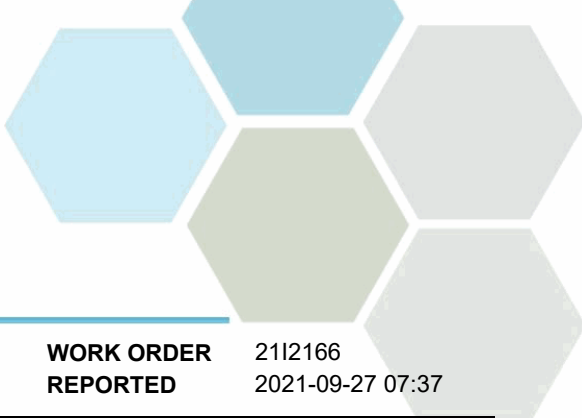


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
Ok Falls - TLGW

WORK ORDER REPORTED 2112166
2021-09-27 07:37

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B111980, Continued									
LCS (B111980-BS1)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	1.01	0.050 mg/L	1.00		101	90-115			
LCS (B111980-BS2)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.964	0.050 mg/L	1.00		96	90-115			
LCS (B111980-BS3)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.974	0.050 mg/L	1.00		97	90-115			
LCS (B111980-BS4)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.988	0.050 mg/L	1.00		99	90-115			
General Parameters, Batch B112026									
Blank (B112026-BLK1)			Prepared: 2021-09-19, Analyzed: 2021-09-19						
Chemical Oxygen Demand	< 20	20 mg/L							
LCS (B112026-BS1)			Prepared: 2021-09-19, Analyzed: 2021-09-19						
Chemical Oxygen Demand	508	20 mg/L	500		102	89-115			
General Parameters, Batch B112171									
Blank (B112171-BLK1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BLK2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BLK3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BS1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	107	1.0 mg/L	100		107	80-120			
LCS (B112171-BS2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	110	1.0 mg/L	100		110	80-120			
LCS (B112171-BS3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	108	1.0 mg/L	100		108	80-120			
LCS (B112171-BS4)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1440	2.0 µS/cm	1410		102	95-105			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
Ok Falls - TLGW

WORK ORDER REPORTED 2112166
2021-09-27 07:37

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B112171, Continued									
LCS (B112171-BS5)				Prepared: 2021-09-20, Analyzed: 2021-09-20					
Conductivity (EC)	1430	2.0 µS/cm	1410	102	95-105				
LCS (B112171-BS6)				Prepared: 2021-09-20, Analyzed: 2021-09-20					
Conductivity (EC)	1450	2.0 µS/cm	1410	103	95-105				
Reference (B112171-SRM1)				Prepared: 2021-09-20, Analyzed: 2021-09-20					
pH	7.00	0.10 pH units	7.01	100	98-102				
Reference (B112171-SRM2)				Prepared: 2021-09-20, Analyzed: 2021-09-20					
pH	7.00	0.10 pH units	7.01	100	98-102				
Reference (B112171-SRM3)				Prepared: 2021-09-20, Analyzed: 2021-09-20					
pH	7.00	0.10 pH units	7.01	100	98-102				

QC Qualifiers:

BLK Analyte concentration in the Method Blank is above the Reporting Limit (RL).



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9		
ATTENTION	Rob Palmer	WORK ORDER	2112167
PO NUMBER	Typical Landfill Drinking Water	RECEIVED / TEMP	2021-09-16 12:30 / 10°C
PROJECT	OK Falls - TLDW	REPORTED	2021-09-27 07:48
PROJECT INFO	2150 Hwy 97 (8048)	COC NUMBER	B095382

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.

Work Order Comments:

Custody Seals Intact: YES

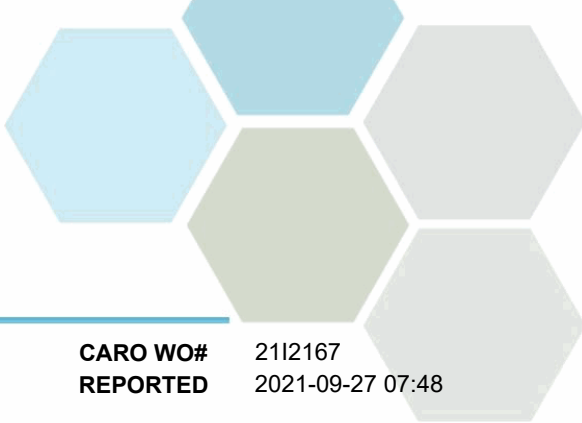
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112167
2021-09-27 07:48

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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2150 Hwy 97 (8048) (2112167-01) | Matrix: Water | Sampled: 2021-09-15 12:30

Anions

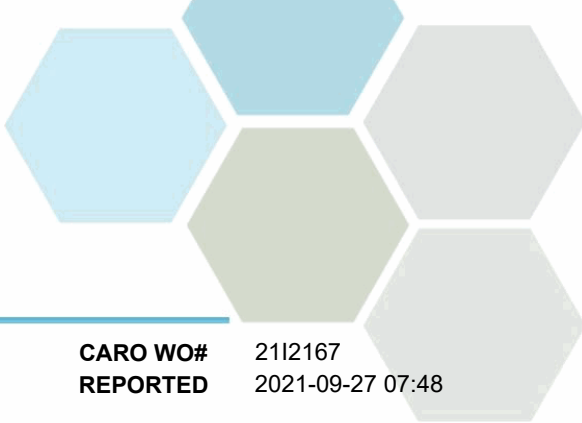
Bromide	< 0.10	N/A	0.10 mg/L	2021-09-16	
Chloride	43.3	AO ≤ 250	0.10 mg/L	2021-09-16	
Fluoride	0.41	MAC = 1.5	0.10 mg/L	2021-09-16	
Nitrate (as N)	0.045	MAC = 10	0.010 mg/L	2021-09-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-09-16	
Sulfate	80.5	AO ≤ 500	1.0 mg/L	2021-09-16	

Calculated Parameters

Hardness, Total (as CaCO3)	336	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	0.0452	N/A	0.0200 mg/L	N/A	

Dissolved Metals

Aluminum, dissolved	< 0.0050	N/A	0.0050 mg/L	2021-09-24	
Antimony, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Arsenic, dissolved	0.00117	N/A	0.00050 mg/L	2021-09-24	
Barium, dissolved	0.199	N/A	0.0050 mg/L	2021-09-24	
Beryllium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Bismuth, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Boron, dissolved	< 0.0500	N/A	0.0500 mg/L	2021-09-24	
Cadmium, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-09-24	
Calcium, dissolved	102	N/A	0.20 mg/L	2021-09-24	
Chromium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-09-24	
Cobalt, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Copper, dissolved	0.00073	N/A	0.00040 mg/L	2021-09-24	
Iron, dissolved	0.036	N/A	0.010 mg/L	2021-09-24	
Lead, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Lithium, dissolved	0.00827	N/A	0.00010 mg/L	2021-09-24	
Magnesium, dissolved	20.0	N/A	0.010 mg/L	2021-09-24	
Manganese, dissolved	0.0107	N/A	0.00020 mg/L	2021-09-24	
Mercury, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-09-22	
Molybdenum, dissolved	0.00188	N/A	0.00010 mg/L	2021-09-24	
Nickel, dissolved	0.00237	N/A	0.00040 mg/L	2021-09-24	
Phosphorus, dissolved	< 0.050	N/A	0.050 mg/L	2021-09-24	
Potassium, dissolved	4.37	N/A	0.10 mg/L	2021-09-24	
Selenium, dissolved	0.00062	N/A	0.00050 mg/L	2021-09-24	
Silicon, dissolved	9.7	N/A	1.0 mg/L	2021-09-24	
Silver, dissolved	< 0.000050	N/A	0.000050 mg/L	2021-09-24	
Sodium, dissolved	20.1	N/A	0.10 mg/L	2021-09-24	
Strontium, dissolved	0.908	N/A	0.0010 mg/L	2021-09-24	
Sulfur, dissolved	27.6	N/A	3.0 mg/L	2021-09-24	
Tellurium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-09-24	
Thallium, dissolved	< 0.000020	N/A	0.000020 mg/L	2021-09-24	
Thorium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-09-24	
Tin, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-09-24	
Titanium, dissolved	< 0.0050	N/A	0.0050 mg/L	2021-09-24	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112167
2021-09-27 07:48

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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2150 Hwy 97 (8048) (2112167-01) | Matrix: Water | Sampled: 2021-09-15 12:30, Continued

Dissolved Metals, Continued

Tungsten, dissolved	< 0.0010	N/A	0.0010	mg/L	2021-09-24	
Uranium, dissolved	0.00547	N/A	0.000020	mg/L	2021-09-24	
Vanadium, dissolved	< 0.0010	N/A	0.0010	mg/L	2021-09-24	
Zinc, dissolved	0.0055	N/A	0.0040	mg/L	2021-09-24	
Zirconium, dissolved	< 0.00010	N/A	0.00010	mg/L	2021-09-24	

General Parameters

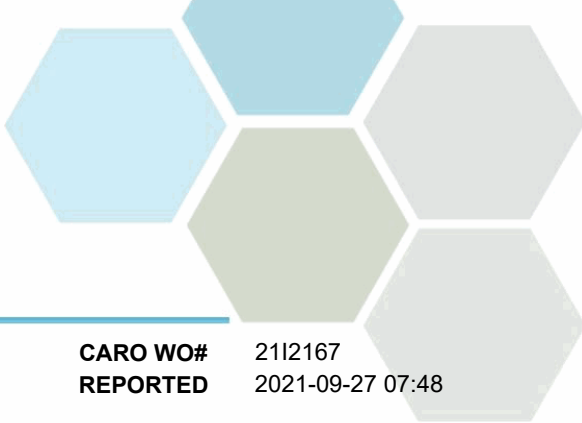
Alkalinity, Total (as CaCO3)	255	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Bicarbonate (as CaCO3)	255	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2021-09-20	
Bicarbonate (HCO3)	312	N/A	1.22	mg/L	N/A	
Carbonate (CO3)	< 0.600	N/A	0.600	mg/L	N/A	
Hydroxide (OH)	< 0.340	N/A	0.340	mg/L	N/A	
Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2021-09-18	
Chemical Oxygen Demand	6	N/A	20	mg/L	2021-09-19	
Conductivity (EC)	735	N/A	2.0	µS/cm	2021-09-20	
pH	8.12	7.0-10.5	0.10	pH units	2021-09-20	HT2

Microbiological Parameters

Coliforms, Total	< 1	MAC = 0	1	CFU/100 mL	2021-09-16	
E. coli	< 1	MAC = 0	1	CFU/100 mL	2021-09-16	

Total Metals

Aluminum, total	0.0052	OG < 0.1	0.0050	mg/L	2021-09-25	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2021-09-25	
Arsenic, total	0.00118	MAC = 0.01	0.00050	mg/L	2021-09-25	
Barium, total	0.199	MAC = 2	0.0050	mg/L	2021-09-25	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2021-09-25	
Cadmium, total	0.000010	MAC = 0.005	0.000010	mg/L	2021-09-25	
Calcium, total	104	None Required	0.20	mg/L	2021-09-25	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-09-25	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-09-25	
Copper, total	0.00133	MAC = 2	0.00040	mg/L	2021-09-25	
Iron, total	0.057	AO ≤ 0.3	0.010	mg/L	2021-09-25	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-09-25	
Lithium, total	0.00829	N/A	0.00010	mg/L	2021-09-25	
Magnesium, total	19.9	None Required	0.010	mg/L	2021-09-25	
Manganese, total	0.0109	MAC = 0.12	0.00020	mg/L	2021-09-25	
Mercury, total	< 0.000010	MAC = 0.001	0.000010	mg/L	2021-09-22	
Molybdenum, total	0.00192	N/A	0.00010	mg/L	2021-09-25	
Nickel, total	0.00242	N/A	0.00040	mg/L	2021-09-25	



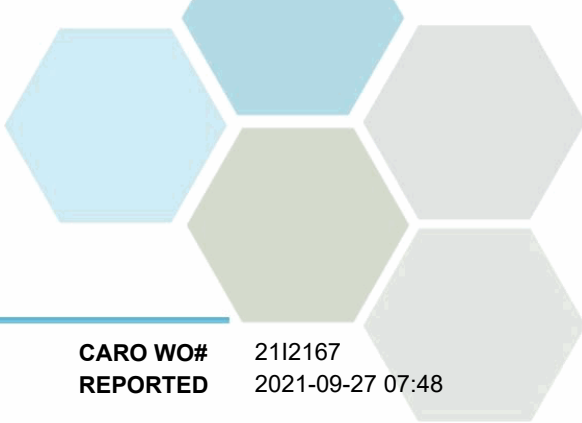
TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112167
2021-09-27 07:48

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
2150 Hwy 97 (8048) (2112167-01) Matrix: Water Sampled: 2021-09-15 12:30, Continued					
<i>Total Metals, Continued</i>					
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-09-25	
Potassium, total	4.33	N/A	0.10 mg/L	2021-09-25	
Selenium, total	0.00067	MAC = 0.05	0.00050 mg/L	2021-09-25	
Silicon, total	9.9	N/A	1.0 mg/L	2021-09-25	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-09-25	
Sodium, total	20.0	AO ≤ 200	0.10 mg/L	2021-09-25	
Strontium, total	0.910	7	0.0010 mg/L	2021-09-25	
Sulfur, total	28.1	N/A	3.0 mg/L	2021-09-25	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-09-25	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-09-25	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-25	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-09-25	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-09-25	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-09-25	
Uranium, total	0.00564	MAC = 0.02	0.000020 mg/L	2021-09-25	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-09-25	
Zinc, total	0.0057	AO ≤ 5	0.0040 mg/L	2021-09-25	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-25	

Sample Qualifiers:
HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

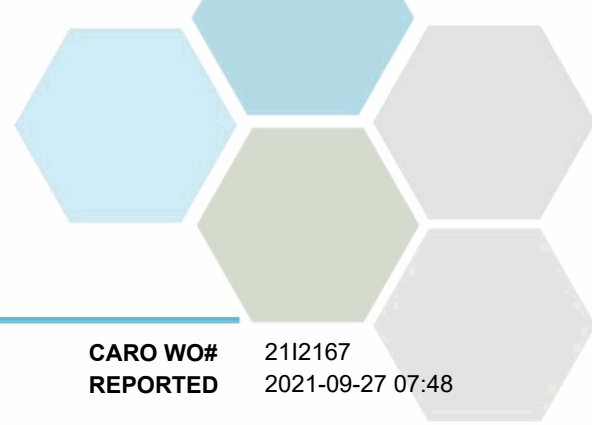
CARO WO# REPORTED 2112167
2021-09-27 07:48

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Coliforms, Total in Water	SM 9222* (2017)	Membrane Filtration / Chromocult Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond
E. coli in Water	SM 9222* (2017)	Membrane Filtration / Chromocult Agar	✓	Kelowna
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
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond

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
AO	Aesthetic Objective
CFU/100 mL	Colony Forming Units per 100 millilitres
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 Regional District of Okanagan Similkameen
PROJECT OK Falls - TLDW

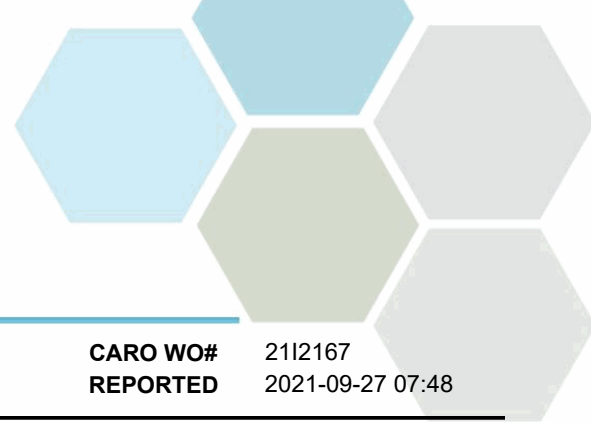
CARO WO# 2112167
REPORTED 2021-09-27 07:48

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: [{@Email}](#)

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



APPENDIX 2: QUALITY CONTROL RESULTS

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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:

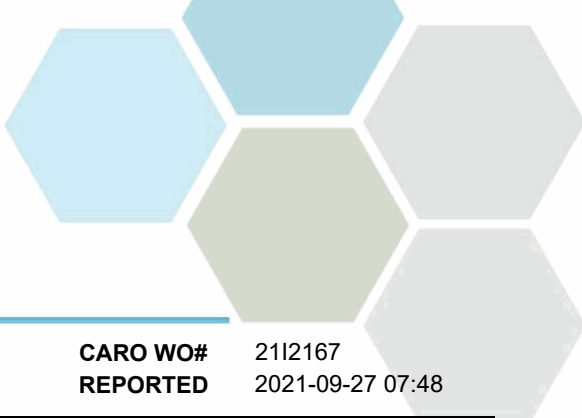
- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected 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 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	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B111794									
Blank (B111794-BLK1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	< 0.10	0.10 mg/L							
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 (B111794-BLK2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	< 0.10	0.10 mg/L							
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 (B111794-BS1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	3.95	0.10 mg/L	4.00		99	85-115			
Chloride	16.1	0.10 mg/L	16.0		100	90-110			
Fluoride	4.00	0.10 mg/L	4.00		100	88-108			
Nitrate (as N)	4.14	0.010 mg/L	4.00		103	90-110			
Nitrite (as N)	2.08	0.010 mg/L	2.00		104	85-115			
Sulfate	16.1	1.0 mg/L	16.0		100	90-110			
LCS (B111794-BS2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Bromide	4.08	0.10 mg/L	4.00		102	85-115			
Chloride	15.9	0.10 mg/L	16.0		99	90-110			
Fluoride	4.02	0.10 mg/L	4.00		101	88-108			
Nitrate (as N)	4.16	0.010 mg/L	4.00		104	90-110			
Nitrite (as N)	1.88	0.010 mg/L	2.00		94	85-115			
Sulfate	15.7	1.0 mg/L	16.0		98	90-110			

Dissolved Metals, Batch B112347

Blank (B112347-BLK1)			Prepared: 2021-09-24, Analyzed: 2021-09-24						
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							



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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
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Dissolved Metals, Batch B112347, Continued

Blank (B112347-BLK1), Continued

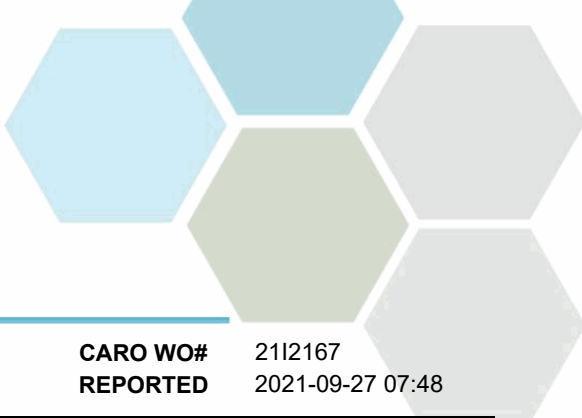
Prepared: 2021-09-24, Analyzed: 2021-09-24

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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							

Blank (B112347-BLK2)

Prepared: 2021-09-24, Analyzed: 2021-09-24

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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							



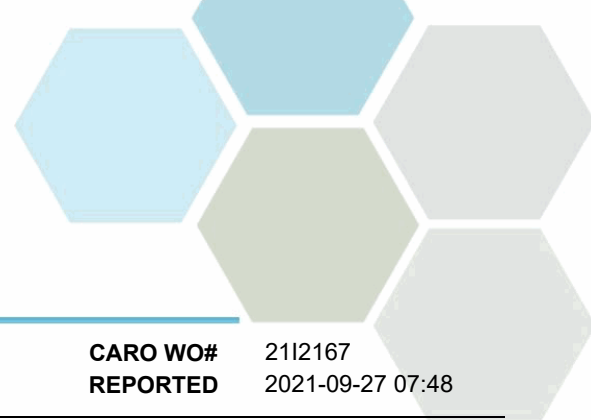
APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B112347, Continued									
Blank (B112347-BLK2), Continued					Prepared: 2021-09-24, Analyzed: 2021-09-24				
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							
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	0.0014	0.0010 mg/L							BLK
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

LCS (B112347-BS1)					Prepared: 2021-09-24, Analyzed: 2021-09-24				
Aluminum, dissolved	0.0226	0.0050 mg/L	0.0200		113	80-120			
Antimony, dissolved	0.0208	0.00020 mg/L	0.0200		104	80-120			
Arsenic, dissolved	0.0205	0.00050 mg/L	0.0200		103	80-120			
Barium, dissolved	0.0208	0.0050 mg/L	0.0200		104	80-120			
Beryllium, dissolved	0.0212	0.00010 mg/L	0.0200		106	80-120			
Bismuth, dissolved	0.0211	0.00010 mg/L	0.0200		106	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		102	80-120			
Cadmium, dissolved	0.0203	0.000010 mg/L	0.0200		102	80-120			
Calcium, dissolved, dissolved	1.89	0.20 mg/L	2.00		95	80-120			
Chromium, dissolved	0.0204	0.00050 mg/L	0.0200		102	80-120			
Cobalt, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Copper, dissolved	0.0217	0.00040 mg/L	0.0200		109	80-120			
Iron, dissolved	1.99	0.010 mg/L	2.00		99	80-120			
Lead, dissolved	0.0218	0.00020 mg/L	0.0200		109	80-120			
Lithium, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Magnesium, dissolved, dissolved	2.16	0.010 mg/L	2.00		108	80-120			
Manganese, dissolved	0.0234	0.00020 mg/L	0.0200		117	80-120			
Molybdenum, dissolved	0.0205	0.00010 mg/L	0.0200		102	80-120			
Nickel, dissolved	0.0209	0.00040 mg/L	0.0200		105	80-120			
Phosphorus, dissolved	2.08	0.050 mg/L	2.00		104	80-120			
Potassium, dissolved	2.02	0.10 mg/L	2.00		101	80-120			
Selenium, dissolved	0.0206	0.00050 mg/L	0.0200		103	80-120			
Silicon, dissolved	2.3	1.0 mg/L	2.00		115	80-120			
Silver, dissolved	0.0204	0.000050 mg/L	0.0200		102	80-120			
Sodium, dissolved	2.10	0.10 mg/L	2.00		105	80-120			
Strontium, dissolved	0.0200	0.0010 mg/L	0.0200		100	80-120			
Sulfur, dissolved	3.0	3.0 mg/L	2.50		118	80-120			
Tellurium, dissolved	0.0200	0.00050 mg/L	0.0200		100	80-120			
Thallium, dissolved	0.0213	0.000020 mg/L	0.0200		106	80-120			
Thorium, dissolved	0.0187	0.00010 mg/L	0.0200		94	80-120			
Tin, dissolved	0.0223	0.00020 mg/L	0.0200		112	80-120			
Titanium, dissolved	0.0216	0.0050 mg/L	0.0200		108	80-120			
Tungsten, dissolved	0.0206	0.0010 mg/L	0.0200		103	80-120			
Uranium, dissolved	0.0216	0.000020 mg/L	0.0200		108	80-120			
Vanadium, dissolved	0.0218	0.0010 mg/L	0.0200		109	80-120			
Zinc, dissolved	0.0196	0.0040 mg/L	0.0200		98	80-120			
Zirconium, dissolved	0.0206	0.00010 mg/L	0.0200		103	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

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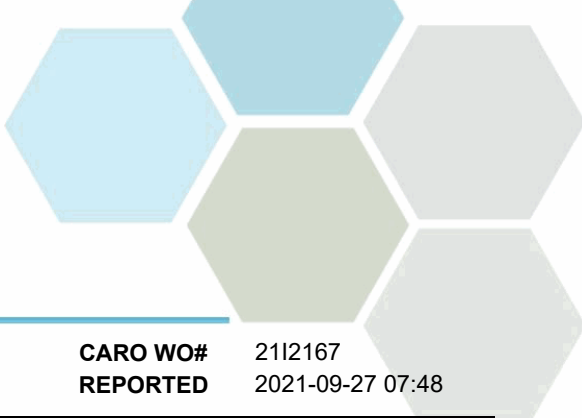
Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B112347, Continued									
Reference (B112347-SRM1)					Prepared: 2021-09-24, Analyzed: 2021-09-24				
Aluminum, dissolved	0.224	0.0050 mg/L	0.235		95	70-130			
Antimony, dissolved	0.0483	0.00020 mg/L	0.0431		112	70-130			
Arsenic, dissolved	0.452	0.00050 mg/L	0.423		107	70-130			
Barium, dissolved	3.26	0.0050 mg/L	3.30		99	70-130			
Beryllium, dissolved	0.218	0.00010 mg/L	0.209		104	70-130			
Boron, dissolved	1.73	0.0500 mg/L	1.65		105	70-130			
Cadmium, dissolved	0.223	0.000010 mg/L	0.221		101	70-130			
Calcium, dissolved, dissolved	7.61	0.20 mg/L	7.72		99	70-130			
Chromium, dissolved	0.435	0.00050 mg/L	0.434		100	70-130			
Cobalt, dissolved	0.130	0.00010 mg/L	0.124		105	70-130			
Copper, dissolved	0.873	0.00040 mg/L	0.815		107	70-130			
Iron, dissolved	1.27	0.010 mg/L	1.27		100	70-130			
Lead, dissolved	0.118	0.00020 mg/L	0.110		107	70-130			
Lithium, dissolved	0.108	0.00010 mg/L	0.100		108	70-130			
Magnesium, dissolved, dissolved	6.77	0.010 mg/L	6.59		103	70-130			
Manganese, dissolved	0.340	0.00020 mg/L	0.342		99	70-130			
Molybdenum, dissolved	0.428	0.00010 mg/L	0.404		106	70-130			
Nickel, dissolved	0.866	0.00040 mg/L	0.835		104	70-130			
Phosphorus, dissolved	0.482	0.050 mg/L	0.499		97	70-130			
Potassium, dissolved	2.91	0.10 mg/L	2.88		101	70-130			
Selenium, dissolved	0.0327	0.00050 mg/L	0.0324		101	70-130			
Sodium, dissolved	18.6	0.10 mg/L	18.0		103	70-130			
Strontium, dissolved	0.926	0.0010 mg/L	0.935		99	70-130			
Thallium, dissolved	0.0403	0.000020 mg/L	0.0385		105	70-130			
Uranium, dissolved	0.255	0.000020 mg/L	0.258		99	70-130			
Vanadium, dissolved	0.862	0.0010 mg/L	0.873		99	70-130			
Zinc, dissolved	0.831	0.0040 mg/L	0.848		98	70-130			

Dissolved Metals, Batch B112357

Blank (B112357-BLK1)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Blank (B112357-BLK2)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Reference (B112357-SRM1)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	0.00517	0.000010 mg/L	0.00581		89	70-130			
Reference (B112357-SRM2)					Prepared: 2021-09-22, Analyzed: 2021-09-22				
Mercury, dissolved	0.00491	0.000010 mg/L	0.00581		85	70-130			

General Parameters, Batch B111980

Blank (B111980-BLK1)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK2)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK3)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B111980-BLK4)					Prepared: 2021-09-18, Analyzed: 2021-09-18				
Ammonia, Total (as N)	< 0.050	0.050 mg/L							

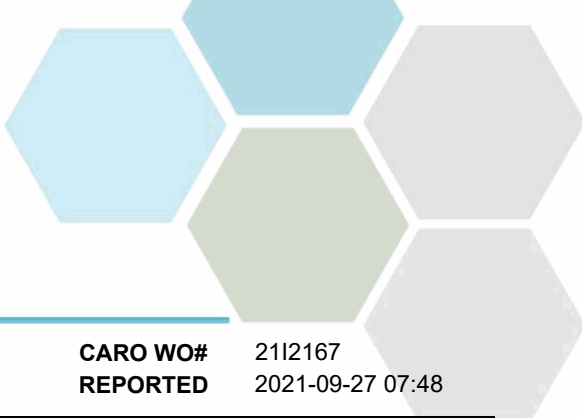


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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B111980, Continued									
LCS (B111980-BS1)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	1.01	0.050 mg/L	1.00		101	90-115			
LCS (B111980-BS2)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.964	0.050 mg/L	1.00		96	90-115			
LCS (B111980-BS3)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.974	0.050 mg/L	1.00		97	90-115			
LCS (B111980-BS4)			Prepared: 2021-09-18, Analyzed: 2021-09-18						
Ammonia, Total (as N)	0.988	0.050 mg/L	1.00		99	90-115			
General Parameters, Batch B112026									
Blank (B112026-BLK1)			Prepared: 2021-09-19, Analyzed: 2021-09-19						
Chemical Oxygen Demand	< 20	20 mg/L							
LCS (B112026-BS1)			Prepared: 2021-09-19, Analyzed: 2021-09-19						
Chemical Oxygen Demand	508	20 mg/L	500		102	89-115			
General Parameters, Batch B112171									
Blank (B112171-BLK1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BLK2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BLK3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
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 (B112171-BS1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	107	1.0 mg/L	100		107	80-120			
LCS (B112171-BS2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	110	1.0 mg/L	100		110	80-120			
LCS (B112171-BS3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Alkalinity, Total (as CaCO3)	108	1.0 mg/L	100		108	80-120			
LCS (B112171-BS4)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1440	2.0 µS/cm	1410		102	95-105			



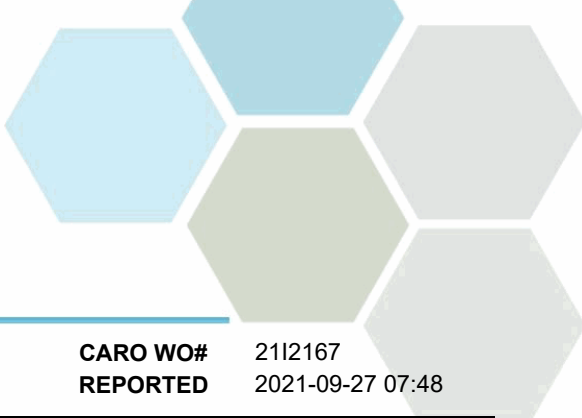
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Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B112171, Continued									
LCS (B112171-BS5)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1430	2.0 µS/cm	1410		102	95-105			
LCS (B112171-BS6)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
Conductivity (EC)	1450	2.0 µS/cm	1410		103	95-105			
Reference (B112171-SRM1)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Reference (B112171-SRM2)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Reference (B112171-SRM3)			Prepared: 2021-09-20, Analyzed: 2021-09-20						
pH	7.00	0.10 pH units	7.01		100	98-102			
Microbiological Parameters, Batch B111739									
Blank (B111739-BLK1)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK2)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK3)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK4)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK5)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B111739-BLK6)			Prepared: 2021-09-16, Analyzed: 2021-09-16						
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Total Metals, Batch B112358									
Blank (B112358-BLK1)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B112358-BLK2)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	< 0.000010	0.000010 mg/L							
Reference (B112358-SRM1)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	0.00512	0.000010 mg/L	0.00581		88	70-130			
Reference (B112358-SRM2)			Prepared: 2021-09-22, Analyzed: 2021-09-22						
Mercury, total	0.00477	0.000010 mg/L	0.00581		82	70-130			
Total Metals, Batch B112443									

Total Metals, Batch B112443



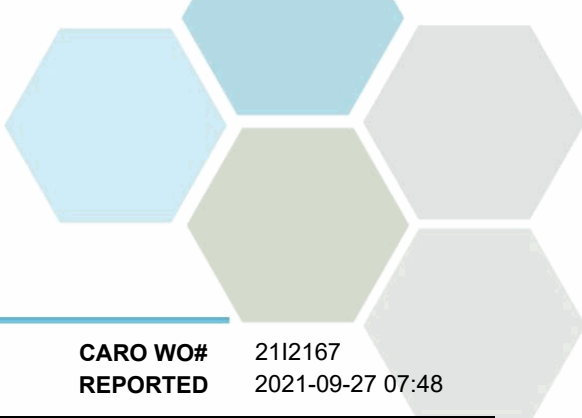
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112167
2021-09-27 07:48

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B112443, Continued									
Blank (B112443-BLK1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B112443-BS1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Aluminum, total	0.0226	0.0050 mg/L	0.0200		113	80-120			
Antimony, total	0.0209	0.00020 mg/L	0.0200		105	80-120			
Arsenic, total	0.0204	0.00050 mg/L	0.0200		102	80-120			
Barium, total	0.0221	0.0050 mg/L	0.0200		110	80-120			
Beryllium, total	0.0220	0.00010 mg/L	0.0200		110	80-120			
Bismuth, total	0.0219	0.00010 mg/L	0.0200		109	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		112	80-120			
Cadmium, total	0.0219	0.000010 mg/L	0.0200		109	80-120			
Calcium, total	2.09	0.20 mg/L	2.00		105	80-120			
Chromium, total	0.0228	0.00050 mg/L	0.0200		114	80-120			
Cobalt, total	0.0218	0.00010 mg/L	0.0200		109	80-120			
Copper, total	0.0225	0.00040 mg/L	0.0200		113	80-120			
Iron, total	2.26	0.010 mg/L	2.00		113	80-120			
Lead, total	0.0282	0.00020 mg/L	0.0200		141	80-120			SPK1
Lithium, total	0.0222	0.00010 mg/L	0.0200		111	80-120			
Magnesium, total	2.23	0.010 mg/L	2.00		111	80-120			
Manganese, total	0.0230	0.00020 mg/L	0.0200		115	80-120			

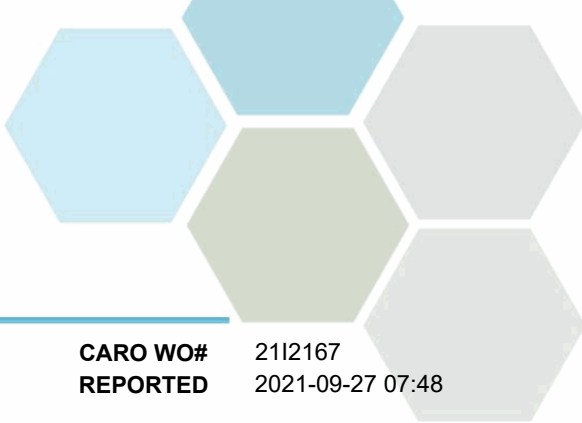


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 2112167
2021-09-27 07:48

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B112443, Continued									
LCS (B112443-BS1), Continued					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Molybdenum, total	0.0220	0.00010 mg/L	0.0200		110	80-120			
Nickel, total	0.0222	0.00040 mg/L	0.0200		111	80-120			
Phosphorus, total	2.16	0.050 mg/L	2.00		108	80-120			
Potassium, total	2.11	0.10 mg/L	2.00		105	80-120			
Selenium, total	0.0213	0.00050 mg/L	0.0200		107	80-120			
Silicon, total	2.3	1.0 mg/L	2.00		117	80-120			
Silver, total	0.0215	0.000050 mg/L	0.0200		108	80-120			
Sodium, total	2.17	0.10 mg/L	2.00		108	80-120			
Strontium, total	0.0236	0.0010 mg/L	0.0200		118	80-120			
Sulfur, total	< 3.0	3.0 mg/L	2.50		99	80-120			
Tellurium, total	0.0226	0.00050 mg/L	0.0200		113	80-120			
Thallium, total	0.0221	0.000020 mg/L	0.0200		111	80-120			
Thorium, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
Tin, total	0.0238	0.00020 mg/L	0.0200		119	80-120			
Titanium, total	0.0230	0.0050 mg/L	0.0200		115	80-120			
Tungsten, total	0.0213	0.0010 mg/L	0.0200		107	80-120			
Uranium, total	0.0228	0.000020 mg/L	0.0200		114	80-120			
Vanadium, total	0.0218	0.0010 mg/L	0.0200		109	80-120			
Zinc, total	0.0250	0.0040 mg/L	0.0200		125	80-120			SPK1
Zirconium, total	0.0219	0.00010 mg/L	0.0200		110	80-120			
Reference (B112443-SRM1)					Prepared: 2021-09-22, Analyzed: 2021-09-25				
Aluminum, total	0.309	0.0050 mg/L	0.299		103	70-130			
Antimony, total	0.0569	0.00020 mg/L	0.0517		110	70-130			
Arsenic, total	0.131	0.00050 mg/L	0.119		110	70-130			
Barium, total	0.788	0.0050 mg/L	0.801		98	70-130			
Beryllium, total	0.0535	0.00010 mg/L	0.0501		107	70-130			
Boron, total	4.26	0.0500 mg/L	4.11		104	70-130			
Cadmium, total	0.0532	0.000010 mg/L	0.0503		106	70-130			
Calcium, total	10.4	0.20 mg/L	10.7		97	70-130			
Chromium, total	0.265	0.00050 mg/L	0.250		106	70-130			
Cobalt, total	0.0425	0.00010 mg/L	0.0384		111	70-130			
Copper, total	0.540	0.00040 mg/L	0.487		111	70-130			
Iron, total	0.532	0.010 mg/L	0.504		106	70-130			
Lead, total	0.322	0.00020 mg/L	0.278		116	70-130			
Lithium, total	0.442	0.00010 mg/L	0.398		111	70-130			
Magnesium, total	3.88	0.010 mg/L	3.59		108	70-130			
Manganese, total	0.114	0.00020 mg/L	0.111		102	70-130			
Molybdenum, total	0.220	0.00010 mg/L	0.196		112	70-130			
Nickel, total	0.270	0.00040 mg/L	0.248		109	70-130			
Phosphorus, total	0.245	0.050 mg/L	0.213		115	70-130			
Potassium, total	6.14	0.10 mg/L	5.89		104	70-130			
Selenium, total	0.129	0.00050 mg/L	0.120		108	70-130			
Sodium, total	9.35	0.10 mg/L	8.71		107	70-130			
Strontium, total	0.419	0.0010 mg/L	0.393		107	70-130			
Thallium, total	0.0886	0.000020 mg/L	0.0787		113	70-130			
Uranium, total	0.0387	0.000020 mg/L	0.0344		113	70-130			
Vanadium, total	0.407	0.0010 mg/L	0.391		104	70-130			
Zinc, total	2.51	0.0040 mg/L	2.50		100	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls - TLDW

CARO WO# 2112167
REPORTED 2021-09-27 07:48

QC Qualifiers:

BLK Analyte concentration in the Method Blank is above the Reporting Limit (RL).
SPK1 The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K3802
ATTENTION	Rob Palmer	RECEIVED / TEMP REPORTED	2021-11-30 12:00 / 6°C 2021-12-09 09:43
PO NUMBER	Typical Landfill Drinking Water	COC NUMBER	No Number
PROJECT	OK Falls - TLDW		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

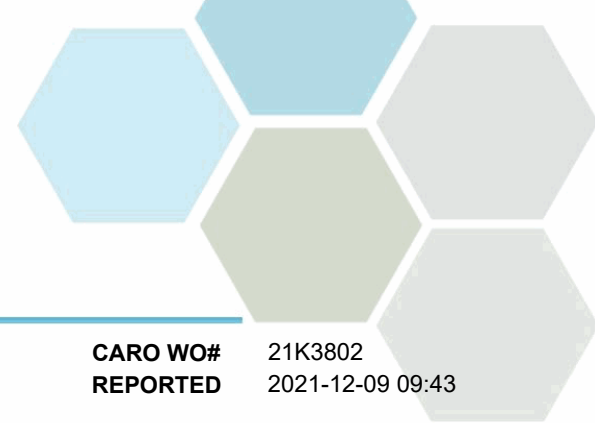
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

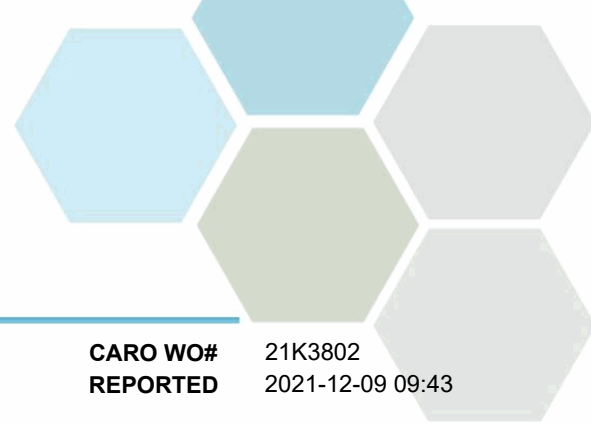


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
2126 Hwy 97 (7273) (21K3802-01) Matrix: Water Sampled: 2021-11-29 10:20					
Anions					
Bromide	< 0.10	N/A	0.10 mg/L	2021-12-02	
Chloride	98.2	AO ≤ 250	0.10 mg/L	2021-12-02	
Fluoride	2.11	MAC = 1.5	0.10 mg/L	2021-12-02	
Nitrate (as N)	1.10	MAC = 10	0.010 mg/L	2021-12-02	
Nitrite (as N)	0.025	MAC = 1	0.010 mg/L	2021-12-02	
Sulfate	102	AO ≤ 500	1.0 mg/L	2021-12-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	323	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	1.13	N/A	0.0200 mg/L	N/A	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	N/A	0.0050 mg/L	2021-12-04	
Antimony, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-12-04	
Arsenic, dissolved	0.00074	N/A	0.00050 mg/L	2021-12-04	
Barium, dissolved	0.0333	N/A	0.0050 mg/L	2021-12-04	
Beryllium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
Bismuth, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
Boron, dissolved	0.158	N/A	0.0500 mg/L	2021-12-04	
Cadmium, dissolved	0.000018	N/A	0.000010 mg/L	2021-12-04	
Calcium, dissolved	62.8	N/A	0.20 mg/L	2021-12-04	
Chromium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-12-04	
Cobalt, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
Copper, dissolved	< 0.00040	N/A	0.00040 mg/L	2021-12-04	
Iron, dissolved	0.083	N/A	0.010 mg/L	2021-12-04	
Lead, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-12-04	
Lithium, dissolved	0.0129	N/A	0.00010 mg/L	2021-12-04	
Magnesium, dissolved	40.4	N/A	0.010 mg/L	2021-12-04	
Manganese, dissolved	0.0565	N/A	0.00020 mg/L	2021-12-04	
Mercury, dissolved	< 0.000010	N/A	0.000010 mg/L	2021-12-04	
Molybdenum, dissolved	0.0168	N/A	0.00010 mg/L	2021-12-04	
Nickel, dissolved	0.00055	N/A	0.00040 mg/L	2021-12-04	
Phosphorus, dissolved	< 0.050	N/A	0.050 mg/L	2021-12-04	
Potassium, dissolved	5.20	N/A	0.10 mg/L	2021-12-04	
Selenium, dissolved	0.0130	N/A	0.00050 mg/L	2021-12-04	
Silicon, dissolved	8.8	N/A	1.0 mg/L	2021-12-04	
Silver, dissolved	< 0.000050	N/A	0.000050 mg/L	2021-12-04	
Sodium, dissolved	44.3	N/A	0.10 mg/L	2021-12-04	
Strontium, dissolved	1.35	N/A	0.0010 mg/L	2021-12-04	
Sulfur, dissolved	33.7	N/A	3.0 mg/L	2021-12-04	
Tellurium, dissolved	< 0.00050	N/A	0.00050 mg/L	2021-12-04	
Thallium, dissolved	< 0.000020	N/A	0.000020 mg/L	2021-12-04	
Thorium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
Tin, dissolved	< 0.00020	N/A	0.00020 mg/L	2021-12-04	
Titanium, dissolved	< 0.0050	N/A	0.0050 mg/L	2021-12-04	

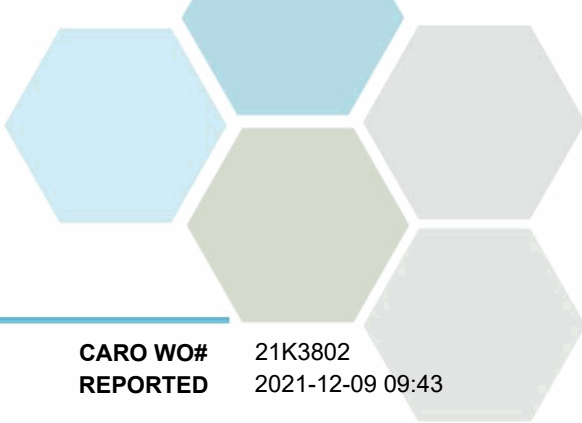


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
2126 Hwy 97 (7273) (21K3802-01) Matrix: Water Sampled: 2021-11-29 10:20, Continued					
<i>Dissolved Metals, Continued</i>					
Tungsten, dissolved	< 0.0010	N/A	0.0010 mg/L	2021-12-04	
Uranium, dissolved	0.00492	N/A	0.000020 mg/L	2021-12-04	
Vanadium, dissolved	< 0.0010	N/A	0.0010 mg/L	2021-12-04	
Zinc, dissolved	0.0132	N/A	0.0040 mg/L	2021-12-04	
Zirconium, dissolved	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
<i>General Parameters</i>					
Alkalinity, Total (as CaCO3)	179	N/A	1.0 mg/L	2021-12-01	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2021-12-01	
Alkalinity, Bicarbonate (as CaCO3)	179	N/A	1.0 mg/L	2021-12-01	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2021-12-01	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2021-12-01	
Bicarbonate (HCO3)	219	N/A	1.22 mg/L	N/A	
Carbonate (CO3)	< 0.600	N/A	0.600 mg/L	N/A	
Hydroxide (OH)	< 0.340	N/A	0.340 mg/L	N/A	
Ammonia, Total (as N)	0.080	None Required	0.050 mg/L	2021-12-01	
Chemical Oxygen Demand	< 5	N/A	20 mg/L	2021-12-09	
Conductivity (EC)	826	N/A	2.0 µS/cm	2021-12-01	
pH	8.06	7.0-10.5	0.10 pH units	2021-12-01	HT2
<i>Microbiological Parameters</i>					
Coliforms, Total	2	MAC = 0	1 CFU/100 mL	2021-11-30	
Coliforms, Fecal	< 1	N/A	1 CFU/100 mL	2021-11-30	
E. coli	< 1	MAC = 0	1 CFU/100 mL	2021-11-30	
<i>Total Metals</i>					
Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2021-12-04	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-12-04	
Arsenic, total	0.00090	MAC = 0.01	0.00050 mg/L	2021-12-04	
Barium, total	0.0331	MAC = 2	0.0050 mg/L	2021-12-04	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
Boron, total	0.126	MAC = 5	0.0500 mg/L	2021-12-04	
Cadmium, total	0.000015	MAC = 0.005	0.000010 mg/L	2021-12-04	
Calcium, total	66.7	None Required	0.20 mg/L	2021-12-04	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-12-04	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
Copper, total	0.00063	MAC = 2	0.00040 mg/L	2021-12-04	
Iron, total	0.238	AO ≤ 0.3	0.010 mg/L	2021-12-04	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-12-04	
Lithium, total	0.0140	N/A	0.00010 mg/L	2021-12-04	
Magnesium, total	42.1	None Required	0.010 mg/L	2021-12-04	
Manganese, total	0.0606	MAC = 0.12	0.00020 mg/L	2021-12-04	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2021-12-04	
Molybdenum, total	0.0181	N/A	0.00010 mg/L	2021-12-04	



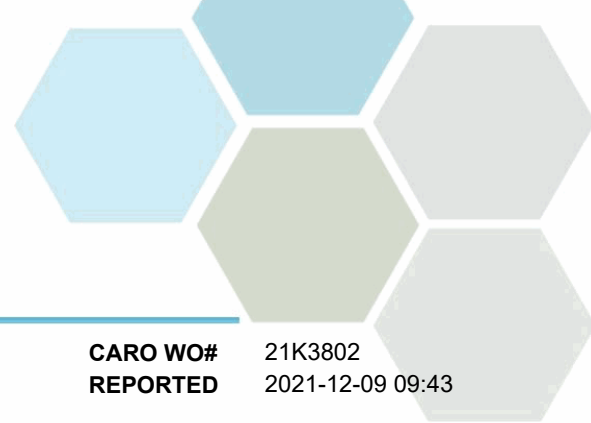
TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
2126 Hwy 97 (7273) (21K3802-01) Matrix: Water Sampled: 2021-11-29 10:20, Continued					
<i>Total Metals, Continued</i>					
Nickel, total	0.00062	N/A	0.00040 mg/L	2021-12-04	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-12-04	
Potassium, total	5.33	N/A	0.10 mg/L	2021-12-04	
Selenium, total	0.0135	MAC = 0.05	0.00050 mg/L	2021-12-04	
Silicon, total	9.1	N/A	1.0 mg/L	2021-12-04	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-12-04	
Sodium, total	46.2	AO ≤ 200	0.10 mg/L	2021-12-04	
Strontium, total	1.43	MAC = 7	0.0010 mg/L	2021-12-04	
Sulfur, total	34.8	N/A	3.0 mg/L	2021-12-04	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-12-04	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-12-04	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-12-04	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-12-04	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-12-04	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-12-04	
Uranium, total	0.00531	MAC = 0.02	0.000020 mg/L	2021-12-04	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-12-04	
Zinc, total	0.0067	AO ≤ 5	0.0040 mg/L	2021-12-04	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-12-04	

Sample Qualifiers:
HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
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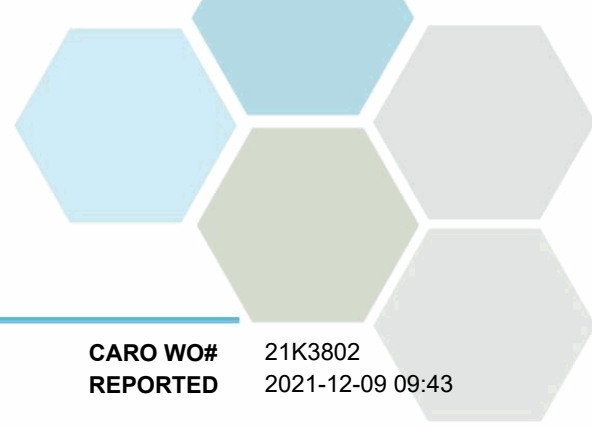
CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Coliforms, Fecal in Water	SM 9222 D (2017)	Membrane Filtration / m-FC Agar	✓	Kelowna
Coliforms, Total in Water	SM 9222* (2017)	Membrane Filtration / Chromocult Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
E. coli in Water	SM 9222* (2017)	Membrane Filtration / Chromocult Agar	✓	Kelowna
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
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
AO	Aesthetic Objective
CFU/100 mL	Colony Forming Units per 100 millilitres
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 Regional District of Okanagan Similkameen
PROJECT OK Falls - TLDW

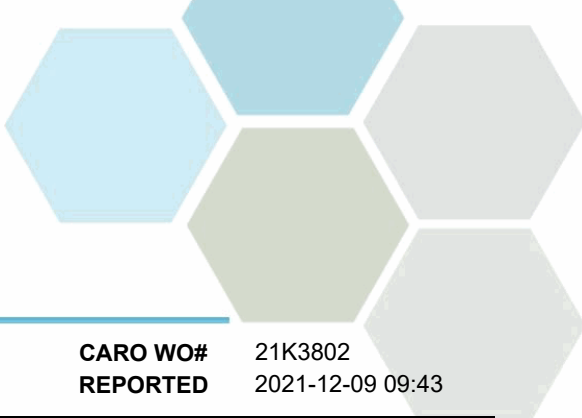
CARO WO# 21K3802
REPORTED 2021-12-09 09:43

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: [{@Email}](#)

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



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

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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	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
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Anions, Batch B1K3327

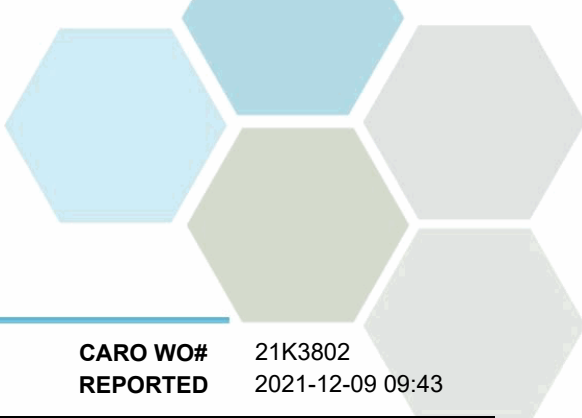
Blank (B1K3327-BLK1)			Prepared: 2021-12-02, Analyzed: 2021-12-02						
Bromide	< 0.10	0.10 mg/L							
Chloride	< 0.10	0.10 mg/L							
Fluoride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Sulfate	< 1.0	1.0 mg/L							
LCS (B1K3327-BS1)			Prepared: 2021-12-02, Analyzed: 2021-12-02						
Bromide	4.01	0.10 mg/L	4.00		100	85-115			
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Fluoride	4.01	0.10 mg/L	4.00		100	88-108			
Nitrate (as N)	4.00	0.010 mg/L	4.00		100	90-110			
Nitrite (as N)	2.01	0.010 mg/L	2.00		100	85-115			
Sulfate	16.0	1.0 mg/L	16.0		100	90-110			

Dissolved Metals, Batch B1L0390

Blank (B1L0390-BLK1)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Blank (B1L0390-BLK2)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Reference (B1L0390-SRM1)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, dissolved	0.000456	0.000010 mg/L	0.000500		91	0-200			
Reference (B1L0390-SRM2)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, dissolved	0.000517	0.000010 mg/L	0.000500		103	0-200			

Dissolved Metals, Batch B1L0489

Blank (B1L0489-BLK1)			Prepared: 2021-12-04, Analyzed: 2021-12-04						
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							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
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Dissolved Metals, Batch B1L0489, Continued

Blank (B1L0489-BLK1), Continued

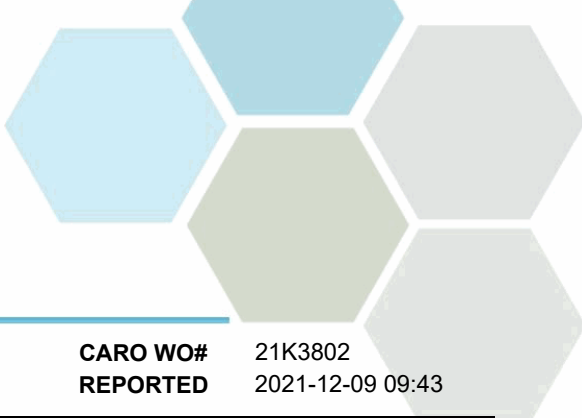
Prepared: 2021-12-04, Analyzed: 2021-12-04

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, 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	< 0.00010	0.00010 mg/L							
Magnesium, dissolved, 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 (B1L0489-BS1)

Prepared: 2021-12-04, Analyzed: 2021-12-04

Aluminum, dissolved	0.0229	0.0050 mg/L	0.0200		114	80-120			
Antimony, dissolved	0.0192	0.00020 mg/L	0.0200		96	80-120			
Arsenic, dissolved	0.0188	0.00050 mg/L	0.0200		94	80-120			
Barium, dissolved	0.0182	0.0050 mg/L	0.0200		91	80-120			
Beryllium, dissolved	0.0195	0.00010 mg/L	0.0200		97	80-120			
Bismuth, dissolved	0.0199	0.00010 mg/L	0.0200		99	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		119	80-120			
Cadmium, dissolved	0.0190	0.000010 mg/L	0.0200		95	80-120			
Calcium, dissolved, dissolved	2.03	0.20 mg/L	2.00		102	80-120			
Chromium, dissolved	0.0192	0.00050 mg/L	0.0200		96	80-120			
Cobalt, dissolved	0.0195	0.00010 mg/L	0.0200		98	80-120			
Copper, dissolved	0.0199	0.00040 mg/L	0.0200		99	80-120			
Iron, dissolved	1.83	0.010 mg/L	2.00		91	80-120			
Lead, dissolved	0.0196	0.00020 mg/L	0.0200		98	80-120			
Lithium, dissolved	0.0194	0.00010 mg/L	0.0200		97	80-120			
Magnesium, dissolved, dissolved	1.99	0.010 mg/L	2.00		99	80-120			
Manganese, dissolved	0.0182	0.00020 mg/L	0.0200		91	80-120			
Molybdenum, dissolved	0.0193	0.00010 mg/L	0.0200		96	80-120			
Nickel, dissolved	0.0195	0.00040 mg/L	0.0200		98	80-120			
Phosphorus, dissolved	1.93	0.050 mg/L	2.00		96	80-120			
Potassium, dissolved	1.87	0.010 mg/L	2.00		94	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

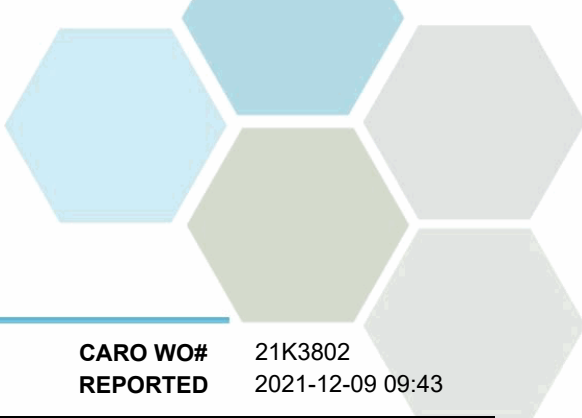
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B1L0489, Continued									
LCS (B1L0489-BS1), Continued					Prepared: 2021-12-04, Analyzed: 2021-12-04				
Selenium, dissolved	0.0195	0.00050 mg/L	0.0200		97	80-120			
Silicon, dissolved	2.2	1.0 mg/L	2.00		111	80-120			
Silver, dissolved	0.0189	0.000050 mg/L	0.0200		95	80-120			
Sodium, dissolved	1.90	0.10 mg/L	2.00		95	80-120			
Strontium, dissolved	0.0178	0.0010 mg/L	0.0200		89	80-120			
Sulfur, dissolved	4.2	3.0 mg/L	5.00		85	80-120			
Tellurium, dissolved	0.0207	0.00050 mg/L	0.0200		104	80-120			
Thallium, dissolved	0.0195	0.000020 mg/L	0.0200		97	80-120			
Thorium, dissolved	0.0185	0.00010 mg/L	0.0200		92	80-120			
Tin, dissolved	0.0196	0.00020 mg/L	0.0200		98	80-120			
Titanium, dissolved	0.0209	0.0050 mg/L	0.0200		104	80-120			
Tungsten, dissolved	0.0197	0.0010 mg/L	0.0200		98	80-120			
Uranium, dissolved	0.0193	0.000020 mg/L	0.0200		96	80-120			
Vanadium, dissolved	0.0189	0.0010 mg/L	0.0200		94	80-120			
Zinc, dissolved	0.0208	0.0040 mg/L	0.0200		104	80-120			
Zirconium, dissolved	0.0196	0.00010 mg/L	0.0200		98	80-120			
Reference (B1L0489-SRM1)					Prepared: 2021-12-04, Analyzed: 2021-12-04				
Aluminum, dissolved	0.211	0.0050 mg/L	0.235		90	70-130			
Antimony, dissolved	0.0448	0.00020 mg/L	0.0431		104	70-130			
Arsenic, dissolved	0.436	0.00050 mg/L	0.423		103	70-130			
Barium, dissolved	2.94	0.0050 mg/L	3.30		89	70-130			
Beryllium, dissolved	0.211	0.00010 mg/L	0.209		101	70-130			
Boron, dissolved	1.81	0.0500 mg/L	1.65		110	70-130			
Cadmium, dissolved	0.216	0.000010 mg/L	0.221		98	70-130			
Calcium, dissolved, dissolved	8.24	0.20 mg/L	7.72		107	70-130			
Chromium, dissolved	0.423	0.00050 mg/L	0.434		98	70-130			
Cobalt, dissolved	0.125	0.00010 mg/L	0.124		101	70-130			
Copper, dissolved	0.818	0.00040 mg/L	0.815		100	70-130			
Iron, dissolved	1.24	0.010 mg/L	1.27		97	70-130			
Lead, dissolved	0.113	0.00020 mg/L	0.110		103	70-130			
Lithium, dissolved	0.103	0.00010 mg/L	0.100		103	70-130			
Magnesium, dissolved, dissolved	6.62	0.010 mg/L	6.59		100	70-130			
Manganese, dissolved	0.320	0.00020 mg/L	0.342		94	70-130			
Molybdenum, dissolved	0.403	0.00010 mg/L	0.404		100	70-130			
Nickel, dissolved	0.847	0.00040 mg/L	0.835		101	70-130			
Phosphorus, dissolved	0.554	0.050 mg/L	0.499		111	70-130			
Potassium, dissolved	2.84	0.10 mg/L	2.88		99	70-130			
Selenium, dissolved	0.0329	0.00050 mg/L	0.0324		101	70-130			
Sodium, dissolved	17.6	0.10 mg/L	18.0		98	70-130			
Strontium, dissolved	0.819	0.0010 mg/L	0.935		88	70-130			
Thallium, dissolved	0.0395	0.000020 mg/L	0.0385		103	70-130			
Uranium, dissolved	0.246	0.000020 mg/L	0.258		95	70-130			
Vanadium, dissolved	0.839	0.0010 mg/L	0.873		96	70-130			
Zinc, dissolved	0.900	0.0040 mg/L	0.848		106	70-130			

General Parameters, Batch B1L0058

Blank (B1L0058-BLK1)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B1L0058-BLK2)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B1L0058-BLK3)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							

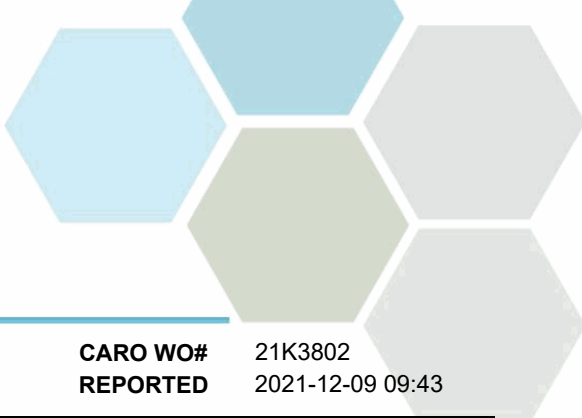


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B1L0058, Continued									
Blank (B1L0058-BLK4)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
LCS (B1L0058-BS1)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Ammonia, Total (as N)	0.974	0.050 mg/L	1.00		97	90-115			
LCS (B1L0058-BS2)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Ammonia, Total (as N)	1.05	0.050 mg/L	1.00		105	90-115			
LCS (B1L0058-BS3)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Ammonia, Total (as N)	1.05	0.050 mg/L	1.00		105	90-115			
LCS (B1L0058-BS4)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Ammonia, Total (as N)	1.04	0.050 mg/L	1.00		104	90-115			
General Parameters, Batch B1L0081									
Blank (B1L0081-BLK1)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
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 (B1L0081-BLK2)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
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 (B1L0081-BS1)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Alkalinity, Total (as CaCO3)	110	1.0 mg/L	100		110	80-120			
LCS (B1L0081-BS2)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Alkalinity, Total (as CaCO3)	110	1.0 mg/L	100		110	80-120			
LCS (B1L0081-BS3)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Conductivity (EC)	1430	2.0 µS/cm	1410		101	95-105			
LCS (B1L0081-BS4)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
Conductivity (EC)	1400	2.0 µS/cm	1410		99	95-105			
Reference (B1L0081-SRM1)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
pH	7.01	0.10 pH units	7.01		100	98-102			
Reference (B1L0081-SRM2)			Prepared: 2021-12-01, Analyzed: 2021-12-01						
pH	7.02	0.10 pH units	7.01		100	98-102			
General Parameters, Batch B1L0891									
Blank (B1L0891-BLK1)			Prepared: 2021-12-09, Analyzed: 2021-12-09						
Chemical Oxygen Demand	< 20	20 mg/L							
LCS (B1L0891-BS1)			Prepared: 2021-12-09, Analyzed: 2021-12-09						
Chemical Oxygen Demand	508	20 mg/L	500		102	89-115			



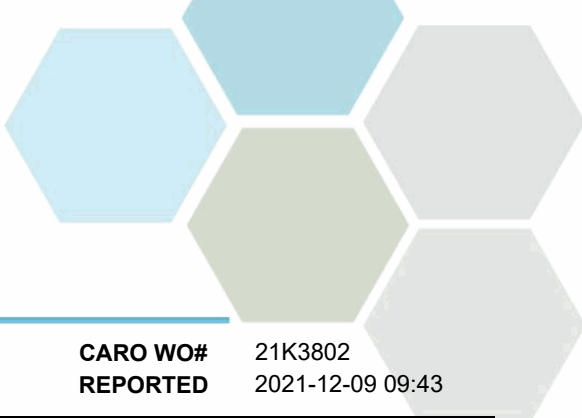
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Microbiological Parameters, Batch B1K3253									
Blank (B1K3253-BLK1)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLK2)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLK3)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLK4)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLK5)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLK6)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLK7)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLK8)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLK9)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLKA)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLKB)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLKC)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLKD)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							
Blank (B1K3253-BLKE)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Total	< 1	1 CFU/100 mL							
E. coli	< 1	1 CFU/100 mL							

Microbiological Parameters, Batch B1K3330

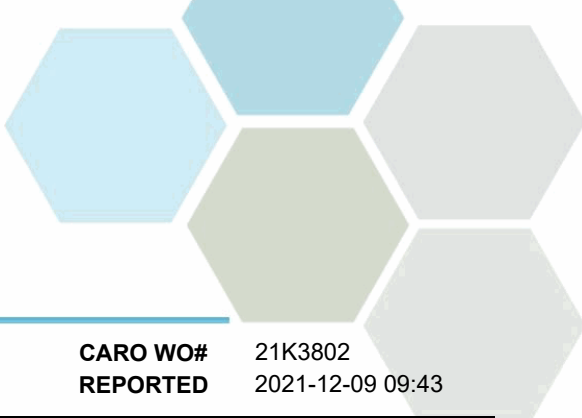


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Microbiological Parameters, Batch B1K3330, Continued									
Blank (B1K3330-BLK1)					Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Fecal	< 1	1 CFU/100 mL							
Duplicate (B1K3330-DUP1)					Source: 21K3802-01 Prepared: 2021-11-30, Analyzed: 2021-11-30				
Coliforms, Fecal	< 1	1 CFU/100 mL		< 1			81		RS2
Total Metals, Batch B1L0361									
Blank (B1L0361-BLK1)					Prepared: 2021-12-03, Analyzed: 2021-12-03				
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B1L0361-BS1)					Prepared: 2021-12-03, Analyzed: 2021-12-03				
Aluminum, total	0.0214	0.0050 mg/L	0.0200		107	80-120			
Antimony, total	0.0211	0.00020 mg/L	0.0200		106	80-120			
Arsenic, total	0.0197	0.00050 mg/L	0.0200		99	80-120			
Barium, total	0.0199	0.0050 mg/L	0.0200		99	80-120			
Beryllium, total	0.0203	0.00010 mg/L	0.0200		102	80-120			
Bismuth, total	0.0208	0.00010 mg/L	0.0200		104	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		119	80-120			
Cadmium, total	0.0196	0.000010 mg/L	0.0200		98	80-120			
Calcium, total	2.10	0.20 mg/L	2.00		105	80-120			

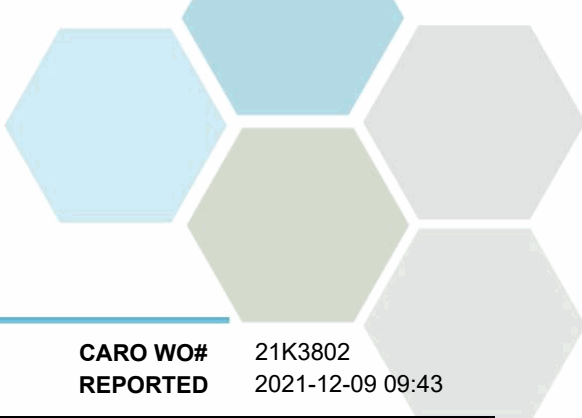


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B1L0361, Continued									
LCS (B1L0361-BS1), Continued					Prepared: 2021-12-03, Analyzed: 2021-12-03				
Chromium, total	0.0201	0.00050 mg/L	0.0200		101	80-120			
Cobalt, total	0.0201	0.00010 mg/L	0.0200		100	80-120			
Copper, total	0.0208	0.00040 mg/L	0.0200		104	80-120			
Iron, total	1.90	0.010 mg/L	2.00		95	80-120			
Lead, total	0.0202	0.00020 mg/L	0.0200		101	80-120			
Lithium, total	0.0201	0.00010 mg/L	0.0200		101	80-120			
Magnesium, total	2.11	0.010 mg/L	2.00		105	80-120			
Manganese, total	0.0205	0.00020 mg/L	0.0200		103	80-120			
Molybdenum, total	0.0204	0.00010 mg/L	0.0200		102	80-120			
Nickel, total	0.0202	0.00040 mg/L	0.0200		101	80-120			
Phosphorus, total	2.17	0.050 mg/L	2.00		109	80-120			
Potassium, total	2.01	0.10 mg/L	2.00		100	80-120			
Selenium, total	0.0199	0.00050 mg/L	0.0200		100	80-120			
Silicon, total	2.3	1.0 mg/L	2.00		116	80-120			
Silver, total	0.0202	0.000050 mg/L	0.0200		101	80-120			
Sodium, total	2.01	0.10 mg/L	2.00		101	80-120			
Strontium, total	0.0189	0.0010 mg/L	0.0200		95	80-120			
Sulfur, total	4.5	3.0 mg/L	5.00		90	80-120			
Tellurium, total	0.0228	0.00050 mg/L	0.0200		114	80-120			
Thallium, total	0.0205	0.000020 mg/L	0.0200		102	80-120			
Thorium, total	0.0203	0.00010 mg/L	0.0200		102	80-120			
Tin, total	0.0208	0.00020 mg/L	0.0200		104	80-120			
Titanium, total	0.0222	0.0050 mg/L	0.0200		111	80-120			
Tungsten, total	0.0204	0.0010 mg/L	0.0200		102	80-120			
Uranium, total	0.0208	0.000020 mg/L	0.0200		104	80-120			
Vanadium, total	0.0195	0.0010 mg/L	0.0200		98	80-120			
Zinc, total	0.0209	0.0040 mg/L	0.0200		105	80-120			
Zirconium, total	0.0214	0.00010 mg/L	0.0200		107	80-120			
Reference (B1L0361-SRM1)					Prepared: 2021-12-03, Analyzed: 2021-12-03				
Aluminum, total	0.200	0.0050 mg/L	0.198		101	70-130			
Antimony, total	0.0260	0.00020 mg/L	0.0230		113	70-130			
Arsenic, total	0.0213	0.00050 mg/L	0.0200		107	70-130			
Barium, total	0.0159	0.0050 mg/L	0.0161		99	70-130			
Beryllium, total	0.00409	0.00010 mg/L	0.00384		106	70-130			
Boron, total	0.211	0.0500 mg/L	0.191		111	70-130			
Cadmium, total	0.00401	0.000010 mg/L	0.00404		99	70-130			
Calcium, total	1.13	0.20 mg/L	0.938		120	70-130			
Chromium, total	0.0274	0.00050 mg/L	0.0256		107	70-130			
Cobalt, total	0.0234	0.00010 mg/L	0.0214		109	70-130			
Copper, total	0.0347	0.00040 mg/L	0.0322		108	70-130			
Iron, total	0.060	0.010 mg/L	0.0580		103	70-130			
Lead, total	0.00842	0.00020 mg/L	0.00796		106	70-130			
Lithium, total	0.0105	0.00010 mg/L	0.0102		104	70-130			
Magnesium, total	0.125	0.010 mg/L	0.112		111	70-130			
Manganese, total	0.0121	0.00020 mg/L	0.0120		100	70-130			
Molybdenum, total	0.0475	0.00010 mg/L	0.0438		108	70-130			
Nickel, total	0.0425	0.00040 mg/L	0.0394		108	70-130			
Potassium, total	0.83	0.10 mg/L	0.820		101	70-130			
Selenium, total	0.122	0.00050 mg/L	0.117		105	70-130			
Sodium, total	0.51	0.10 mg/L	0.490		105	70-130			
Strontium, total	0.265	0.0010 mg/L	0.276		96	70-130			
Thallium, total	0.0129	0.000020 mg/L	0.0118		109	70-130			
Uranium, total	0.0101	0.000020 mg/L	0.00970		104	70-130			
Vanadium, total	0.0283	0.0010 mg/L	0.0274		103	70-130			
Zinc, total	0.0949	0.0040 mg/L	0.0884		107	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls - TLDW

CARO WO# REPORTED 21K3802
2021-12-09 09:43

Analyte	Result	MRL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Metals, Batch B1L0391									
Blank (B1L0391-BLK1)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B1L0391-BLK2)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B1L0391-BLK3)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, total	< 0.000010	0.000010 mg/L							
Reference (B1L0391-SRM1)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, total	0.000538	0.000010 mg/L	0.000500		108	0-200			
Reference (B1L0391-SRM2)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, total	0.000526	0.000010 mg/L	0.000500		105	0-200			
Reference (B1L0391-SRM3)			Prepared: 2021-12-03, Analyzed: 2021-12-04						
Mercury, total	0.000526	0.000010 mg/L	0.000500		105	0-200			

QC Qualifiers:

RS2 The Reporting Limits for this sample have been raised due to limited sample volume.

APPENDIX Q

Okanagan River Channel Water Quality Monitoring Database Summary 2021

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results	Number of Results with Exceedances
Field Results									
Conductivity	Okanagan River Channel 100m Upstream	µS/cm	293.9	275.4	323.3	13.9	12	12	0
	Okanagan River Channel 100m Downstream	µS/cm	288.5	273	301.2	8	12	12	0
	Okanagan River Channel 500m Downstream	µS/cm	286.6	274.6	295.3	6	12	12	0
Dissolved oxygen	Okanagan River Channel 100m Upstream	mg/L	12.44	7.52	18.14	3.23	12	12	1
	Okanagan River Channel 100m Downstream	mg/L	11.09	7.69	14.85	2.33	12	12	2
	Okanagan River Channel 500m Downstream	mg/L	10.96	7.38	13.78	2.25	12	12	2
Oxidation reduction potential	Okanagan River Channel 100m Upstream	mV	67.5	30.6	143.6	29.6	12	12	0
	Okanagan River Channel 100m Downstream	mV	65.6	40.3	133	24	12	12	0
	Okanagan River Channel 500m Downstream	mV	63.7	37.8	122.8	21.2	12	12	0
pH	Okanagan River Channel 100m Upstream		8.18	7.62	8.63	0.32	12	12	0
	Okanagan River Channel 100m Downstream		8.26	7.58	8.68	0.33	12	12	0
	Okanagan River Channel 500m Downstream		8.3	7.72	8.72	0.29	12	12	0
Temperature	Okanagan River Channel 100m Upstream	°C	11.7	2.1	23.6	7.2	12	12	4
	Okanagan River Channel 100m Downstream	°C	11.5	2.1	23.9	7.4	12	12	4
	Okanagan River Channel 500m Downstream	°C	11.6	1.9	24.2	7.5	12	12	4
Total dissolved solids	Okanagan River Channel 100m Upstream	mg/L	191	178.7	210	9.04	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	187.5	177.5	195.7	5.2	12	12	0
	Okanagan River Channel 500m Downstream	mg/L	186.2	178.1	191.7	4.0	12	12	0
Turbidity	Okanagan River Channel 100m Upstream	NTU	1.45	0.63	2.34	0.68	6	6	0
	Okanagan River Channel 100m Downstream	NTU	1.2	0.6	1.87	0.46	6	6	0
	Okanagan River Channel 500m Downstream	NTU	1.13	0.81	1.58	0.31	6	6	0
Lab Results									
General									
Alkalinity (bicarbonate, as CaCO ₃)	Okanagan River Channel 100m Upstream	mg/L	123	115	135	9	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	122	113	142	11	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	121	116	129	6	4	4	0
Alkalinity (carbonate, as CaCO ₃)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L	2.6	<1.0	6.8	2.8	6	3	0
	Okanagan River Channel 500m Downstream	mg/L	1.2	<1.0	3.2	1.4	4	1	0
Alkalinity (hydroxide, as CaCO ₃)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Alkalinity (phenolphthalein, as CaCO ₃)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L	1.3	<1.0	3.4	1.3	6	2	0
	Okanagan River Channel 500m Downstream	mg/L	0.8	<1.0	1.6	0.6	4	1	0
Alkalinity (total, as CaCO ₃)	Okanagan River Channel 100m Upstream	mg/L	123	115	135	9	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	124	118	142	9	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	122	118	129	5	4	4	0
Biochemical oxygen demand	Okanagan River Channel 100m Upstream	mg/L	0.9	<1.0	1.9	0.7	4	1	0
	Okanagan River Channel 100m Downstream	mg/L	1	1	1.5	0.4	6	4	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results	Number of Results with Exceedances
Chemical Oxygen Demand	Okanagan River Channel 100m Upstream	mg/L	14	10	19	4	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	18	12	26	5	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	15	11	23	5	4	4	0
Chloride	Okanagan River Channel 100m Upstream	mg/L	5.87	5.43	6.46	0.3	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	6.04	5.48	6.6	0.31	14	14	0
	Okanagan River Channel 500m Downstream	mg/L	6	5.56	6.55	0.27	12	12	0
Conductivity	Okanagan River Channel 100m Upstream	µS/cm	267	241	283	12	12	12	0
	Okanagan River Channel 100m Downstream	µS/cm	270	247	284	9	14	14	0
	Okanagan River Channel 500m Downstream	µS/cm	249.4	<2.0	282	78.5	12	11	0
Fluoride	Okanagan River Channel 100m Upstream	mg/L	0.15	0.14	0.17	0.01	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	0.15	0.13	0.16	0.01	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	0.15	0.13	0.17	0.02	4	4	0
Hardness, Total (total as CaCO ₃)	Okanagan River Channel 100m Upstream	mg/L	122	109	145	10	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	122	109	148	11	14	14	0
	Okanagan River Channel 500m Downstream	mg/L	120	111	133	7	12	12	0
pH	Okanagan River Channel 100m Upstream		8.13	7.88	8.35	0.13	12	12	0
	Okanagan River Channel 100m Downstream		8.23	8.01	8.46	0.15	14	14	0
	Okanagan River Channel 500m Downstream		8.22	8.02	8.43	0.13	12	12	0
Sulphate	Okanagan River Channel 100m Upstream	mg/L	28.6	26.7	30.2	1.2	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	29.1	27.9	30.5	0.9	14	14	0
	Okanagan River Channel 500m Downstream	mg/L	29.9	27	41.7	3.8	12	12	0
Total suspended solids	Okanagan River Channel 100m Upstream	mg/L	2.7	2	11.2	2.9	12	6	0
	Okanagan River Channel 100m Downstream	mg/L	2.4	<2.0	11.2	2.7	14	3	0
	Okanagan River Channel 500m Downstream	mg/L	3.6	2	10.8	3.4	12	6	0
Microbiological									
E. coli (MPN)	Okanagan River Channel 100m Upstream	MPN/100 mL	14	1	44	12	29	27	27
	Okanagan River Channel 100m Downstream	MPN/100 mL	13	1	56	12	31	28	28
	Okanagan River Channel 500m Downstream	MPN/100 mL	13	<1	49	11	29	27	27
Fecal coliforms (MPN)	Okanagan River Channel 100m Upstream	MPN/100 mL	17	1	49	14	29	27	27
	Okanagan River Channel 100m Downstream	MPN/100 mL	16	<1	59	13	31	28	28
	Okanagan River Channel 500m Downstream	MPN/100 mL	15	<1	50	12	29	27	27
Nutrients									
Ammonia (total, as N)	Okanagan River Channel 100m Upstream	mg/L					12	0	0
	Okanagan River Channel 100m Downstream	mg/L	0.027	<0.050	0.051	0.007	14	1	0
	Okanagan River Channel 500m Downstream	mg/L	0.028	<0.050	0.061	0.01	12	1	0
Nitrate (as N)	Okanagan River Channel 100m Upstream	mg/L	0.006	<0.010	0.021	0.005	12	1	0
	Okanagan River Channel 100m Downstream	mg/L					14	0	0
	Okanagan River Channel 500m Downstream	mg/L					12	0	0
Nitrite (as N)	Okanagan River Channel 100m Upstream	mg/L					12	0	0
	Okanagan River Channel 100m Downstream	mg/L					14	0	0
	Okanagan River Channel 500m Downstream	mg/L					12	0	0

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results	Number of Results with Exceedances
Total nitrogen	Okanagan River Channel 100m Upstream	mg/L	0.243	0.186	0.334	0.042	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	0.235	0.193	0.378	0.045	14	14	0
	Okanagan River Channel 500m Downstream	mg/L	0.244	0.192	0.354	0.043	12	12	0
Total kjeldahl nitrogen	Okanagan River Channel 100m Upstream	mg/L	0.241	0.186	0.334	0.043	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	0.235	0.193	0.378	0.045	14	14	0
	Okanagan River Channel 500m Downstream	mg/L	0.244	0.192	0.354	0.043	12	12	0
Orthophosphate (dissolved, as P)	Okanagan River Channel 100m Upstream	mg/L					12	0	0
	Okanagan River Channel 100m Downstream	mg/L					14	0	0
	Okanagan River Channel 500m Downstream	mg/L					12	0	0
Phosphorus (total, by ICPMS/ICPOES)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Phosphorus (total, APHA 4500-P)	Okanagan River Channel 100m Upstream	mg/L	0.0139	0.0056	0.031	0.0081	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	0.0132	<0.0050	0.03	0.0074	14	13	0
	Okanagan River Channel 500m Downstream	mg/L	0.0142	<0.0050	0.0312	0.009	12	11	0
Phosphorus (dissolved, APHA 4500-P)	Okanagan River Channel 100m Upstream	mg/L	0.0073	<0.0050	0.0198	0.0048	12	9	0
	Okanagan River Channel 100m Downstream	mg/L	0.0075	<0.0050	0.0205	0.0045	14	11	0
	Okanagan River Channel 500m Downstream	mg/L	0.0075	<0.0050	0.0234	0.0059	12	8	0
Potassium (total)	Okanagan River Channel 100m Upstream	mg/L	2.66	2.37	3.24	0.27	11	11	0
	Okanagan River Channel 100m Downstream	mg/L	2.6	2.19	3.31	0.29	13	13	0
	Okanagan River Channel 500m Downstream	mg/L	2.57	2.29	2.99	0.21	11	11	0
Total Metals									
Aluminum (total)	Okanagan River Channel 100m Upstream	mg/L	0.068	<0.0050	0.234	0.1111	4	3	1
	Okanagan River Channel 100m Downstream	mg/L	0.068	0.0061	0.33	0.1289	6	6	1
	Okanagan River Channel 500m Downstream	mg/L	0.0947	0.0057	0.346	0.1676	4	4	1
Antimony (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Arsenic (total)	Okanagan River Channel 100m Upstream	mg/L	0.00034	<0.00050	0.00061	0.00018	4	1	0
	Okanagan River Channel 100m Downstream	mg/L	0.00041	<0.00050	0.00059	0.00017	6	3	0
	Okanagan River Channel 500m Downstream	mg/L	0.00049	<0.00050	0.00065	0.00017	4	3	0
Barium (total)	Okanagan River Channel 100m Upstream	mg/L	0.0248	0.0229	0.0278	0.0021	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	0.0253	0.0233	0.0332	0.0039	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	0.025	0.0219	0.03	0.0035	4	4	0
Beryllium (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Bismuth (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results	Number of Results with Exceedances
Boron (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Cadmium (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Calcium (total)	Okanagan River Channel 100m Upstream	mg/L	32.3	28.6	37.7	2.5	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	32.4	29.5	38.6	2.7	14	14	0
	Okanagan River Channel 500m Downstream	mg/L	31.7	29.5	34.8	1.8	12	12	0
Chromium (total)	Okanagan River Channel 100m Upstream	mg/L	0.00189	<0.00050	0.0068	0.00328	4	1	1
	Okanagan River Channel 100m Downstream	mg/L	0.00085	<0.00050	0.00385	0.00147	6	1	1
	Okanagan River Channel 500m Downstream	mg/L	0.00147	<0.00050	0.00513	0.00244	4	1	1
Cobalt (total)	Okanagan River Channel 100m Upstream	mg/L	0.00007	<0.00010	0.00014	0.00005	4	1	0
	Okanagan River Channel 100m Downstream	mg/L	0.00007	<0.00010	0.00018	0.00005	6	1	0
	Okanagan River Channel 500m Downstream	mg/L	0.00008	<0.00010	0.00017	0.00006	4	1	0
Copper (total)	Okanagan River Channel 100m Upstream	mg/L	0.001	0.00068	0.00145	0.00034	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	0.00092	0.00069	0.00127	0.00022	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	0.00552	0.0006	0.0189	0.00894	4	4	0
Iron (total)	Okanagan River Channel 100m Upstream	mg/L	0.063	<0.010	0.209	0.098	4	3	0
	Okanagan River Channel 100m Downstream	mg/L	0.072	0.013	0.329	0.127	6	6	1
	Okanagan River Channel 500m Downstream	mg/L	0.096	<0.010	0.344	0.166	4	3	1
Lead (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Lithium (total)	Okanagan River Channel 100m Upstream	mg/L	0.00346	0.00327	0.00357	0.00013	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	0.00357	0.00325	0.00373	0.00017	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	0.00364	0.00359	0.00369	0.00005	4	4	0
Magnesium (total)	Okanagan River Channel 100m Upstream	mg/L	10.07	9.01	12.3	0.96	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	10.07	8.53	12.6	1.06	14	14	0
	Okanagan River Channel 500m Downstream	mg/L	9.98	8.94	11.2	0.74	12	12	0
Manganese (total)	Okanagan River Channel 100m Upstream	mg/L	0.01186	0.00499	0.0211	0.00805	4	4	1
	Okanagan River Channel 100m Downstream	mg/L	0.00998	0.00514	0.0208	0.00696	6	6	1
	Okanagan River Channel 500m Downstream	mg/L	0.01225	0.00516	0.0202	0.00777	4	4	1
Mercury (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Molybdenum (total)	Okanagan River Channel 100m Upstream	mg/L	0.00324	0.00308	0.00332	0.00011	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	0.00336	0.00317	0.00363	0.00017	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	0.00333	0.00317	0.0035	0.00016	4	4	0
Nickel (total)	Okanagan River Channel 100m Upstream	mg/L	0.00041	<0.00040	0.00069	0.00025	4	2	0
	Okanagan River Channel 100m Downstream	mg/L	0.00063	<0.00040	0.00091	0.00027	6	5	0
	Okanagan River Channel 500m Downstream	mg/L	0.0004	<0.00040	0.00074	0.00026	4	2	0

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results	Number of Results with Exceedances
Selenium (total)	Okanagan River Channel 100m Upstream	mg/L	0.00034	<0.00050	0.0006	0.00017	4	1	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L	0.00033	<0.00050	0.00056	0.00015	4	1	0
Silicon (total, as Si)	Okanagan River Channel 100m Upstream	mg/L	3.1	2.6	3.3	0.3	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	3.1	3	3.4	0.1	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	3.1	2.6	3.5	0.4	4	4	0
Silver (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Sodium (total)	Okanagan River Channel 100m Upstream	mg/L	12.6	11.4	15.9	1.3	12	12	0
	Okanagan River Channel 100m Downstream	mg/L	12.5	10.6	16.1	1.2	14	14	0
	Okanagan River Channel 500m Downstream	mg/L	12.5	11	13.4	0.6	12	12	0
Strontium (total)	Okanagan River Channel 100m Upstream	mg/L	0.289	0.269	0.3	0.015	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	0.288	0.281	0.312	0.012	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	0.292	0.274	0.316	0.018	4	4	0
Sulphur (total)	Okanagan River Channel 100m Upstream	mg/L	10.3	8.8	11.6	1.2	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	10.3	9.5	11.5	0.9	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	10.1	9	11.7	1.2	4	4	0
Tellurium (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Thallium (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Thorium (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Tin (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L	0.00012	<0.00020	0.00022	0.00005	6	1	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Titanium (total)	Okanagan River Channel 100m Upstream	mg/L	0.0052	<0.0050	0.0132	0.0054	4	1	0
	Okanagan River Channel 100m Downstream	mg/L	0.0057	<0.0050	0.0215	0.0078	6	1	0
	Okanagan River Channel 500m Downstream	mg/L	0.0082	<0.0050	0.0251	0.0113	4	1	0
Tungsten (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L					6	0	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Uranium (total)	Okanagan River Channel 100m Upstream	mg/L	0.00241	0.00233	0.00248	0.00006	4	4	0
	Okanagan River Channel 100m Downstream	mg/L	0.00244	0.00226	0.00256	0.0001	6	6	0
	Okanagan River Channel 500m Downstream	mg/L	0.00252	0.00241	0.00268	0.00011	4	4	0
Vanadium (total)	Okanagan River Channel 100m Upstream	mg/L	0.001	<0.0010	0.0015	0.0005	4	2	0
	Okanagan River Channel 100m Downstream	mg/L	0.0009	<0.0010	0.0016	0.0005	6	2	0
	Okanagan River Channel 500m Downstream	mg/L	0.0011	<0.0010	0.0019	0.0007	4	2	0

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results	Number of Results with Exceedances
Zinc (total)	Okanagan River Channel 100m Upstream	mg/L					4	0	0
	Okanagan River Channel 100m Downstream	mg/L	0.012	<0.0040	0.0313	0.0115	6	4	0
	Okanagan River Channel 500m Downstream	mg/L					4	0	0
Zirconium (total)	Okanagan River Channel 100m Upstream	mg/L	0.00008	<0.00010	0.00017	0.00006	4	1	0
	Okanagan River Channel 100m Downstream	mg/L	0.00006	<0.00010	0.00012	0.00003	6	1	0
	Okanagan River Channel 500m Downstream	mg/L	0.00008	<0.00010	0.00018	0.00007	4	1	0

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	
Date Sampled	20-Jan-21	17-Feb-21	17-Mar-21	20-Apr-21	05-May-21	11-May-21	18-May-21	26-May-21	02-Jun-21	09-Jun-21	
Lab Sample ID for analyses except bacteriological	21A1871-01	21B1890-01	21C2545-01	21D2209-01		21E1315-02					
Lab Sample ID for Bacteriological samples	21A1875-01	21B1889-01	21C2518-01	21D2212-01	21E0634-01	21E1315-01	21E2189-01	21E3067-01	21F0515-01	21F1466-01	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
Analyte	Unit										
Field Results											
Conductivity	µS/cm	323.3	302.8	289	282.5		281.9				
Dissolved oxygen	mg/L	18.14	15.93	15.6	12.43		11.24				
Oxidation reduction potential	mV	69.7	79.8	77.6	56.8		31.4				
pH		7.62	7.89	8.07	8.39		8.42				
Temperature	°C	4	2.1	4.8	10.1		13.3				
Total dissolved solids	mg/L	210	196.3	187.2	183.9		183.3				
Turbidity	NTU	1.32	1.1	0.63			2.34				
Lab Results											
General											
Alkalinity (bicarbonate, as CaCO3)	mg/L	135			115						
Alkalinity (carbonate, as CaCO3)	mg/L	<1.0			<1.0						
Alkalinity (hydroxide, as CaCO3)	mg/L	<1.0			<1.0						
Alkalinity (phenolphthalein, as CaCO3)	mg/L	<1.0			<1.0						
Alkalinity (total, as CaCO3)	mg/L	135			115						
Biochemical oxygen demand	mg/L	<1.2			<1.3						
Chemical Oxygen Demand	mg/L	17			11						
Chloride	mg/L	6.2	5.94	6	5.61		5.55				
Conductivity	µS/cm	282	270	283	261		265				
Fluoride	mg/L	0.15			0.17						
Hardness, Total (total as CaCO3)	mg/L	122	125	116	109		111				
pH		8.07	8.09	8.03	8.08		8.15				
Sulphate	mg/L	29.3	27.2	30	27.5		26.7				
Total suspended solids	mg/L	4.2	2.4	2	11.2		4				
Microbiological											
E. coli (MPN)	MPN/100 mL	<1	1	<1	9	3	<u>15</u>	<u>20</u>	<u>44</u>	<u>42</u>	<u>16</u>
Fecal coliforms (MPN)	MPN/100 mL	<1	1	<1	9	3	<u>15</u>	<u>20</u>	<u>44</u>	<u>44</u>	<u>16</u>
Nutrients											
Ammonia (total, as N)	mg/L	<0.050	<0.050	<0.050	<0.050		<0.050				
Nitrate (as N)	mg/L	<0.010	<0.010	<0.010	<0.010		<0.010				
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010		<0.010				
Total nitrogen	mg/L	0.25	0.223	0.206	0.186		0.334				
Total kjeldahl nitrogen	mg/L	0.25	0.223	0.206	0.186		0.334				
Orthophosphate (dissolved, as P)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050		<0.0050				
Phosphorus (total, APHA 4500-P)	mg/L	0.0151	0.0131	0.0108	0.031		0.0131				
Phosphorus (dissolved, APHA 4500-P)	mg/L	<0.0050	0.007	0.0061	0.0081		0.0072				
Potassium (total)	mg/L	2.81		2.37	2.39		2.48				

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Sampling Location	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	
		Date Sampled	20-Jan-21	17-Feb-21	17-Mar-21	20-Apr-21	05-May-21	11-May-21	18-May-21	26-May-21	02-Jun-21	09-Jun-21
Lab Sample ID for analyses except bacteriological			21A1871-01	21B1890-01	21C2545-01	21D2209-01		21E1315-02				
Lab Sample ID for Bacteriological samples			21A1875-01	21B1889-01	21C2518-01	21D2212-01	21E0634-01	21E1315-01	21E2189-01	21E3067-01	21F0515-01	21F1466-01
Sample Type			Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Total Metals												
Aluminum (total)	mg/L		<0.0050			0.234						
Antimony (total)	mg/L		<0.00020			<0.00020						
Arsenic (total)	mg/L		0.00061			<0.00050						
Barium (total)	mg/L		0.0229			0.0278						
Beryllium (total)	mg/L		<0.00010			<0.00010						
Bismuth (total)	mg/L		<0.00010			<0.00010						
Boron (total)	mg/L		<0.0500			<0.0500						
Cadmium (total)	mg/L		<0.000010			<0.000010						
Calcium (total)	mg/L		31.3	33.9	31.5	28.6		29.1				
Chromium (total)	mg/L		<u>0.0068</u>			<0.00050						
Cobalt (total)	mg/L		<0.00010			0.00014						
Copper (total)	mg/L		0.00068			0.00145						
Iron (total)	mg/L		<0.010			0.209						
Lead (total)	mg/L		<0.00020			<0.00020						
Lithium (total)	mg/L		0.00352			0.00347						
Magnesium (total)	mg/L		10.5	9.81	9.13	9.01		9.41				
Manganese (total)	mg/L		<u>0.0211</u>			0.0161						
Mercury (total)	mg/L		<0.000010			<0.000010						
Molybdenum (total)	mg/L		0.00326			0.00308						
Nickel (total)	mg/L		<0.00040			0.00069						
Selenium (total)	mg/L		<0.00050			<0.00050						
Silicon (total, as Si)	mg/L		3.3			2.6						
Silver (total)	mg/L		<0.000050			<0.000050						
Sodium (total)	mg/L		11.6	12.1	11.6	11.4		12.1				
Strontium (total)	mg/L		0.3			0.269						
Sulphur (total)	mg/L		10.8			9.9						
Tellurium (total)	mg/L		<0.00050			<0.00050						
Thallium (total)	mg/L		<0.000020			<0.000020						
Thorium (total)	mg/L		<0.00010			<0.00010						
Tin (total)	mg/L		<0.00020			<0.00020						
Titanium (total)	mg/L		<0.0050			0.0132						
Tungsten (total)	mg/L		<0.0010			<0.0010						
Uranium (total)	mg/L		0.00233			0.00248						
Vanadium (total)	mg/L		0.0015			0.0013						
Zinc (total)	mg/L		<0.0040			<0.0040						
Zirconium (total)	mg/L		<0.00010			0.00017						

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	
Date Sampled	16-Jun-21	22-Jun-21	28-Jun-21	06-Jul-21	12-Jul-21	21-Jul-21	27-Jul-21	04-Aug-21	10-Aug-21	18-Aug-21	
Lab Sample ID for analyses except bacteriological	21F2437-01					21G2737-01			21H1185-01		
Lab Sample ID for Bacteriological samples	21F2430-01	21F3143-01	21F3794-01	21G0669-01	21G1376-01	21G2736-01	21G3479-01	21H0507-01	21H1179-01	21H2292-01	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
Analyte	Unit										
Field Results											
Conductivity	µS/cm	275.4				287.5			289		
Dissolved oxygen	mg/L	9.56				9.62			7.52		
Oxidation reduction potential	mV	63.9				30.6			46.9		
pH		8.41				8.63			8.17		
Temperature	°C	<u>16.9</u>				<u>23.6</u>			<u>22.8</u>		
Total dissolved solids	mg/L	178.7				186.5			187.9		
Turbidity	NTU	1.11									
Lab Results											
General											
Alkalinity (bicarbonate, as CaCO3)	mg/L					119					
Alkalinity (carbonate, as CaCO3)	mg/L					<1.0					
Alkalinity (hydroxide, as CaCO3)	mg/L					<1.0					
Alkalinity (phenolphthalein, as CaCO3)	mg/L					<1.0					
Alkalinity (total, as CaCO3)	mg/L					119					
Biochemical oxygen demand	mg/L					<1.0					
Chemical Oxygen Demand	mg/L					19					
Chloride	mg/L	5.43				6.05			5.57		
Conductivity	µS/cm	241				265			262		
Fluoride	mg/L					0.14					
Hardness, Total (total as CaCO3)	mg/L	121				118			117		
pH		8.26				8.18			8.35		
Sulphate	mg/L	27.3				28.2			29.8		
Total suspended solids	mg/L	<2.0				<2.0			<2.0		
Microbiological											
E. coli (MPN)	MPN/100 mL	<u>28</u>	<u>17</u>	<u>11</u>	8	<u>29</u>	<u>13</u>	<u>17</u>	9	<u>33</u>	10
Fecal coliforms (MPN)	MPN/100 mL	<u>29</u>	<u>18</u>	<u>13</u>	<u>21</u>	<u>33</u>	<u>15</u>	<u>30</u>	<u>12</u>	<u>34</u>	<u>11</u>
Nutrients											
Ammonia (total, as N)	mg/L	<0.050				<0.050			<0.050		
Nitrate (as N)	mg/L	<0.010				<0.010			<0.010		
Nitrite (as N)	mg/L	<0.010				<0.010			<0.010		
Total nitrogen	mg/L	0.268				0.188			0.257		
Total kjeldahl nitrogen	mg/L	0.268				0.188			0.257		
Orthophosphate (dissolved, as P)	mg/L	<0.0050				<0.0050			<0.0050		
Phosphorus (total, APHA 4500-P)	mg/L	0.0061				0.0114			0.0072		
Phosphorus (dissolved, APHA 4500-P)	mg/L	<0.0050				0.0114			0.0054		
Potassium (total)	mg/L	2.49				2.58			2.44		

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream
		16-Jun-21	22-Jun-21	28-Jun-21	06-Jul-21	12-Jul-21	21-Jul-21	27-Jul-21	04-Aug-21	10-Aug-21
Total Metals										
Aluminum (total)	mg/L					0.0089				
Antimony (total)	mg/L					<0.00020				
Arsenic (total)	mg/L					<0.00050				
Barium (total)	mg/L					0.0247				
Beryllium (total)	mg/L					<0.00010				
Bismuth (total)	mg/L					<0.00010				
Boron (total)	mg/L					<0.0500				
Cadmium (total)	mg/L					<0.000010				
Calcium (total)	mg/L	33.2				30.8		30.9		
Chromium (total)	mg/L					<0.00050				
Cobalt (total)	mg/L					<0.00010				
Copper (total)	mg/L					0.0008				
Iron (total)	mg/L					0.013				
Lead (total)	mg/L					<0.00020				
Lithium (total)	mg/L					0.00357				
Magnesium (total)	mg/L	9.19				9.91		9.55		
Manganese (total)	mg/L					0.00525				
Mercury (total)	mg/L					<0.000010				
Molybdenum (total)	mg/L					0.00332				
Nickel (total)	mg/L					0.00053				
Selenium (total)	mg/L					0.0006				
Silicon (total, as Si)	mg/L					3.2				
Silver (total)	mg/L					<0.000050				
Sodium (total)	mg/L	11.9				13.3		12.5		
Strontium (total)	mg/L					0.288				
Sulphur (total)	mg/L					11.6				
Tellurium (total)	mg/L					<0.00050				
Thallium (total)	mg/L					<0.000020				
Thorium (total)	mg/L					<0.00010				
Tin (total)	mg/L					<0.00020				
Titanium (total)	mg/L					<0.0050				
Tungsten (total)	mg/L					<0.0010				
Uranium (total)	mg/L					0.00243				
Vanadium (total)	mg/L					<0.0010				
Zinc (total)	mg/L					<0.0040				
Zirconium (total)	mg/L					<0.00010				

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Downstream
Date Sampled	27-Aug-21	31-Aug-21	07-Sep-21	13-Sep-21	21-Sep-21	28-Sep-21	25-Oct-21	08-Nov-21	07-Dec-21	20-Jan-21
Lab Sample ID for analyses except bacteriological					21I2987-01	21I3942-01	21J3500-01	21K1279-01	21L1220-01	21A1871-02
Lab Sample ID for Bacteriological samples	21H3419-01	21I0166-01	21I0997-01	21I1687-01	21I2983-01		21J3497-01	21K1276-01	21L1219-01	21A1875-02
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit									
Field Results										
Conductivity	µS/cm				293.2		289.8	298.1	314.7	291.5
Dissolved oxygen	mg/L				10.19		10.92	12.42	15.7	12.74
Oxidation reduction potential	mV				66.4		84.4	58.6	143.6	69.9
pH					8.5		7.85	8.34	7.87	7.79
Temperature	°C				<u>17.1</u>		11.2	8.7	5.5	3.6
Total dissolved solids	mg/L				190.5		187.9	193.7	204.7	189.2
Turbidity	NTU							2.2		1.12
Lab Results										
General										
Alkalinity (bicarbonate, as CaCO3)	mg/L						123			142
Alkalinity (carbonate, as CaCO3)	mg/L						<1.0			<1.0
Alkalinity (hydroxide, as CaCO3)	mg/L						<1.0			<1.0
Alkalinity (phenolphthalein, as CaCO3)	mg/L						<1.0			<1.0
Alkalinity (total, as CaCO3)	mg/L						123			142
Biochemical oxygen demand	mg/L						1.9			1.5
Chemical Oxygen Demand	mg/L						10			14
Chloride	mg/L				6		5.83	5.82	6.46	6.36
Conductivity	µS/cm				270		275	256	275	275
Fluoride	mg/L						0.14			0.16
Hardness, Total (total as CaCO3)	mg/L				145		129	129	124	129
pH					8.28		8.18	8.04	7.88	8.08
Sulphate	mg/L				30.2		29.6	29.2	28.4	29.6
Total suspended solids	mg/L				<2.0		<2.9	2.4	<2.0	4.2
Microbiological										
E. coli (MPN)	MPN/100 mL	<u>31</u>	<u>19</u>	6	5	10	2	4	5	3
Fecal coliforms (MPN)	MPN/100 mL	<u>49</u>	<u>22</u>	6	<u>11</u>	<u>13</u>	2	7	6	3
Nutrients										
Ammonia (total, as N)	mg/L					<0.050		<0.050	<0.050	<0.050
Nitrate (as N)	mg/L					<0.010		<0.010	0.021	<0.010
Nitrite (as N)	mg/L					<0.010		<0.010	<0.010	<0.010
Total nitrogen	mg/L					0.235		0.291	0.229	0.251
Total kjeldahl nitrogen	mg/L					0.235		0.291	0.229	0.23
Orthophosphate (dissolved, as P)	mg/L					<0.0050		<0.0050	<0.0050	<0.0050
Phosphorus (total, APHA 4500-P)	mg/L					0.0056		0.0088	0.0162	0.0285
Phosphorus (dissolved, APHA 4500-P)	mg/L					<0.0050		0.0052	0.0098	0.0198
Potassium (total)	mg/L					3.24		2.72	2.89	2.87

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Downstream
Date Sampled	27-Aug-21	31-Aug-21	07-Sep-21	13-Sep-21	21-Sep-21	28-Sep-21	25-Oct-21	08-Nov-21	07-Dec-21	20-Jan-21
Lab Sample ID for analyses except bacteriological					21I2987-01	21I3942-01	21J3500-01	21K1279-01	21L1220-01	21A1871-02
Lab Sample ID for Bacteriological samples	21H3419-01	21I0166-01	21I0997-01	21I1687-01	21I2983-01		21J3497-01	21K1276-01	21L1219-01	21A1875-02
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit									
Total Metals										
Aluminum (total)	mg/L						0.0265			0.0061
Antimony (total)	mg/L						<0.00020			<0.00020
Arsenic (total)	mg/L						<0.00050			0.00059
Barium (total)	mg/L						0.0237			0.0238
Beryllium (total)	mg/L						<0.00010			<0.00010
Bismuth (total)	mg/L						<0.00010			<0.00010
Boron (total)	mg/L						<0.0500			<0.0500
Cadmium (total)	mg/L						<0.000010			<0.000010
Calcium (total)	mg/L				37.7		34.6	33.4	32.2	33.2
Chromium (total)	mg/L						<0.00050			0.00385
Cobalt (total)	mg/L						<0.00010			<0.00010
Copper (total)	mg/L						0.00108			0.00069
Iron (total)	mg/L						0.025			0.014
Lead (total)	mg/L						<0.00020			<0.00020
Lithium (total)	mg/L						0.00327			0.00373
Magnesium (total)	mg/L				12.3		10.3	11	10.7	11.1
Manganese (total)	mg/L						0.00499			0.0168
Mercury (total)	mg/L						<0.000010			<0.000010
Molybdenum (total)	mg/L						0.00331			0.00346
Nickel (total)	mg/L						<0.00040			<0.00040
Selenium (total)	mg/L						<0.00050			<0.00050
Silicon (total, as Si)	mg/L						3.3			3.4
Silver (total)	mg/L						<0.000050			<0.000050
Sodium (total)	mg/L				15.9		12.4	13.9	12.8	12.1
Strontium (total)	mg/L						0.3			0.312
Sulphur (total)	mg/L						8.8			11.5
Tellurium (total)	mg/L						<0.00050			<0.00050
Thallium (total)	mg/L						<0.000020			<0.000020
Thorium (total)	mg/L						<0.00010			<0.00010
Tin (total)	mg/L						<0.00020			0.00022
Titanium (total)	mg/L						<0.0050			<0.0050
Tungsten (total)	mg/L						<0.0010			<0.0010
Uranium (total)	mg/L						0.00238			0.00248
Vanadium (total)	mg/L						<0.0010			0.0016
Zinc (total)	mg/L						<0.0040			0.0313
Zirconium (total)	mg/L						<0.00010			<0.00010

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	
		17-Feb-21 21B1890-02	17-Mar-21 21C2546-01	20-Apr-21 21D2209-02	05-May-21 21E0634-02	11-May-21 21E1315-04	18-May-21 21E2189-02	26-May-21 21E3067-02	02-Jun-21 21F0515-02	09-Jun-21 21F1466-02	16-Jun-21 21F2437-02
Field Results											
Conductivity	µS/cm	299.2	290.6	291.1		276.2				273	
Dissolved oxygen	mg/L	14.85	13.56	12.44		9.86				9.37	
Oxidation reduction potential	mV	60.8	62.3	55.5		40.3				59.1	
pH		8.21	8.16	8.3		8.45				8.55	
Temperature	°C	2.1	4.7	9.6		13.3				<u>16.9</u>	
Total dissolved solids	mg/L	194.3	189.2	189.2		179.4				177.5	
Turbidity	NTU	0.87	0.6			1.87				1.2	
Lab Results											
General											
Alkalinity (bicarbonate, as CaCO3)	mg/L			122							
Alkalinity (carbonate, as CaCO3)	mg/L			<1.0							
Alkalinity (hydroxide, as CaCO3)	mg/L			<1.0							
Alkalinity (phenolphthalein, as CaCO3)	mg/L			<1.0							
Alkalinity (total, as CaCO3)	mg/L			122							
Biochemical oxygen demand	mg/L			<1.3							
Chemical Oxygen Demand	mg/L			12							
Chloride	mg/L	6.04	6.06	5.88		5.7				5.53	
Conductivity	µS/cm	271	284	280		271				247	
Fluoride	mg/L			0.16							
Hardness, Total (total as CaCO3)	mg/L	132	109	112		113				120	
pH		8.11	8.11	8.12		8.22				8.26	
Sulphate	mg/L	28	30.5	29.2		28.6				27.9	
Total suspended solids	mg/L	2.6	<2.0	11.2		<4.0				<2.0	
Microbiological											
E. coli (MPN)	MPN/100 mL	<1	<1	<u>14</u>	<1	<u>11</u>	<u>15</u>	<u>23</u>	<u>56</u>	<u>15</u>	<u>22</u>
Fecal coliforms (MPN)	MPN/100 mL	<1	<1	<u>16</u>	<1	<u>11</u>	<u>17</u>	<u>23</u>	<u>59</u>	<u>19</u>	<u>22</u>
Nutrients											
Ammonia (total, as N)	mg/L	<0.050	0.051	<0.050		<0.050				<0.050	
Nitrate (as N)	mg/L	<0.010	<0.010	<0.010		<0.010				<0.010	
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010		<0.010				<0.010	
Total nitrogen	mg/L	0.228	0.212	0.216		0.207				0.236	
Total kjeldahl nitrogen	mg/L	0.228	0.212	0.216		0.207				0.236	
Orthophosphate (dissolved, as P)	mg/L	<0.0050	<0.0050	<0.0050		<0.0050				<0.0050	
Phosphorus (total, APHA 4500-P)	mg/L	0.0125	0.0091	0.026		0.0131				0.0057	
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.0081	0.0064	0.0055		<0.0050				0.0079	
Potassium (total)	mg/L		2.19	2.38		2.47				2.5	

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream
Date Sampled	17-Feb-21	17-Mar-21	20-Apr-21	05-May-21	11-May-21	18-May-21	26-May-21	02-Jun-21	09-Jun-21	16-Jun-21
Lab Sample ID for analyses except bacteriological	21B1890-02	21C2546-01	21D2209-02	21E0634-02	21E1315-04	21E2189-02	21E3067-02	21F0515-02	21F1466-02	21F2437-02
Lab Sample ID for Bacteriological samples	21B1889-02	21C2547-01	21D2212-02		21E1315-03					21F2430-02
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit									
Total Metals										
Aluminum (total)	mg/L			0.33						
Antimony (total)	mg/L			<0.00020						
Arsenic (total)	mg/L			0.00053						
Barium (total)	mg/L			0.0332						
Beryllium (total)	mg/L			<0.00010						
Bismuth (total)	mg/L			<0.00010						
Boron (total)	mg/L			<0.0500						
Cadmium (total)	mg/L			<0.000010						
Calcium (total)	mg/L	34.8	29.5	30.2	29.8					32.6
Chromium (total)	mg/L			<0.00050						
Cobalt (total)	mg/L			0.00018						
Copper (total)	mg/L			0.00085						
Iron (total)	mg/L			<u>0.329</u>						
Lead (total)	mg/L			<0.00020						
Lithium (total)	mg/L			0.00367						
Magnesium (total)	mg/L	11	8.53	8.96	9.44					9.48
Manganese (total)	mg/L			<u>0.0208</u>						
Mercury (total)	mg/L			<0.000010						
Molybdenum (total)	mg/L			0.00363						
Nickel (total)	mg/L			0.00071						
Selenium (total)	mg/L			<0.00050						
Silicon (total, as Si)	mg/L			3.1						
Silver (total)	mg/L			<0.000050						
Sodium (total)	mg/L	12.4	10.6	12	12.7					12.5
Strontium (total)	mg/L			0.281						
Sulphur (total)	mg/L			11.4						
Tellurium (total)	mg/L			<0.00050						
Thallium (total)	mg/L			<0.000020						
Thorium (total)	mg/L			<0.00010						
Tin (total)	mg/L			<0.00020						
Titanium (total)	mg/L			0.0215						
Tungsten (total)	mg/L			<0.0010						
Uranium (total)	mg/L			0.00256						
Vanadium (total)	mg/L			0.0015						
Zinc (total)	mg/L			0.0051						
Zirconium (total)	mg/L			0.00012						

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream
Date Sampled	22-Jun-21	28-Jun-21	06-Jul-21	12-Jul-21	21-Jul-21	21-Jul-21	21-Jul-21	27-Jul-21	04-Aug-21	10-Aug-21
Lab Sample ID for analyses except bacteriological	21F3143-02	21F3794-02	21G0669-02	21G1376-02	21G2737-02	21G2737-03	21G2737-04	21G3479-02	21H0507-02	21H1185-02
Lab Sample ID for Bacteriological samples					21G2736-02	21G2736-03	21G2736-04			21H1179-02
Sample Type	Normal	Normal	Normal	Normal	Normal	Duplicate	Duplicate	Normal	Normal	Normal
Analyte	Unit									
Field Results										
Conductivity	µS/cm				285.3					288.4
Dissolved oxygen	mg/L				7.69					7.74
Oxidation reduction potential	mV				48.7					45.5
pH					8.68					8.49
Temperature	°C				23.9					22.9
Total dissolved solids	mg/L				185.2					187.2
Turbidity	NTU									
Lab Results										
General										
Alkalinity (bicarbonate, as CaCO3)	mg/L				114	113	116			
Alkalinity (carbonate, as CaCO3)	mg/L				5.3	6.8	1.9			
Alkalinity (hydroxide, as CaCO3)	mg/L				<1.0	<1.0	<1.0			
Alkalinity (phenolphthalein, as CaCO3)	mg/L				2.7	3.4	<1.0			
Alkalinity (total, as CaCO3)	mg/L				119	120	118			
Biochemical oxygen demand	mg/L				1	<1.0	1.1			
Chemical Oxygen Demand	mg/L				18	26	22			
Chloride	mg/L				6.05	6.19	6.31			5.48
Conductivity	µS/cm				266	271	267			261
Fluoride	mg/L				0.14	0.14	0.14			
Hardness, Total (total as CaCO3)	mg/L				117	116	116			114
pH					8.44	8.46	8.36			8.36
Sulphate	mg/L				28.4	28.4	28.5			28.2
Total suspended solids	mg/L				<4.0	<4.0	<4.0			<2.0
Microbiological										
E. coli (MPN)	MPN/100 mL	8	14	29	38	18	10	15	23	20
Fecal coliforms (MPN)	MPN/100 mL	8	14	42	40	19	11	15	23	22
Nutrients										
Ammonia (total, as N)	mg/L				<0.050	<0.050	<0.050			<0.050
Nitrate (as N)	mg/L				<0.010	<0.010	<0.010			<0.010
Nitrite (as N)	mg/L				<0.010	<0.010	<0.010			<0.010
Total nitrogen	mg/L				0.193	0.219	0.221			0.205
Total kjeldahl nitrogen	mg/L				0.193	0.219	0.221			0.205
Orthophosphate (dissolved, as P)	mg/L				<0.0050	<0.0050	<0.0050			<0.0050
Phosphorus (total, APHA 4500-P)	mg/L				0.0101	0.0112	0.0107			0.0071
Phosphorus (dissolved, APHA 4500-P)	mg/L				0.0087	0.0086	0.01			0.006
Potassium (total)	mg/L				2.52	2.45	2.47			2.42

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream
Date Sampled	22-Jun-21	28-Jun-21	06-Jul-21	12-Jul-21	21-Jul-21	21-Jul-21	21-Jul-21	27-Jul-21	04-Aug-21	10-Aug-21
Lab Sample ID for analyses except bacteriological	21F3143-02	21F3794-02	21G0669-02	21G1376-02	21G2737-02	21G2737-03	21G2737-04	21G3479-02	21H0507-02	21H1185-02
Lab Sample ID for Bacteriological samples					21G2736-02	21G2736-03	21G2736-04			21H1179-02
Sample Type	Normal	Normal	Normal	Normal	Normal	Duplicate	Duplicate	Normal	Normal	Normal
Analyte	Unit									
Total Metals										
Aluminum (total)	mg/L				0.0171	0.0089	0.0069			
Antimony (total)	mg/L				<0.00020	<0.00020	<0.00020			
Arsenic (total)	mg/L				<0.00050	<0.00050	<0.00050			
Barium (total)	mg/L				0.0235	0.0245	0.0235			
Beryllium (total)	mg/L				<0.00010	<0.00010	<0.00010			
Bismuth (total)	mg/L				<0.00010	<0.00010	<0.00010			
Boron (total)	mg/L				<0.0500	<0.0500	<0.0500			
Cadmium (total)	mg/L				<0.000010	<0.000010	<0.000010			
Calcium (total)	mg/L				31.1	30.5	30.3			30.1
Chromium (total)	mg/L				<0.00050	<0.00050	<0.00050			
Cobalt (total)	mg/L				<0.00010	<0.00010	<0.00010			
Copper (total)	mg/L				0.00098	0.00103	0.00072			
Iron (total)	mg/L				0.013	0.013	0.013			
Lead (total)	mg/L				<0.00020	<0.00020	<0.00020			
Lithium (total)	mg/L				0.00367	0.00357	0.00355			
Magnesium (total)	mg/L				9.66	9.53	9.67			9.51
Manganese (total)	mg/L				0.00544	0.00514	0.00533			
Mercury (total)	mg/L				<0.000010	<0.000010	<0.000010			
Molybdenum (total)	mg/L				0.00317	0.00323	0.00333			
Nickel (total)	mg/L				0.00045	0.00086	0.00062			
Selenium (total)	mg/L				<0.00050	<0.00050	<0.00050			
Silicon (total, as Si)	mg/L				3.1	3.1	3			
Silver (total)	mg/L				<0.000050	<0.000050	<0.000050			
Sodium (total)	mg/L				12.4	12.1	12.4			12.3
Strontium (total)	mg/L				0.285	0.281	0.282			
Sulphur (total)	mg/L				9.5	9.5	9.9			
Tellurium (total)	mg/L				<0.00050	<0.00050	<0.00050			
Thallium (total)	mg/L				<0.000020	<0.000020	<0.000020			
Thorium (total)	mg/L				<0.00010	<0.00010	<0.00010			
Tin (total)	mg/L				<0.00020	<0.00020	<0.00020			
Titanium (total)	mg/L				<0.0050	<0.0050	<0.0050			
Tungsten (total)	mg/L				<0.0010	<0.0010	<0.0010			
Uranium (total)	mg/L				0.00248	0.00242	0.00243			
Vanadium (total)	mg/L				<0.0010	<0.0010	<0.0010			
Zinc (total)	mg/L				0.018	<0.0040	<0.0040			
Zirconium (total)	mg/L				<0.00010	<0.00010	<0.00010			

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	
Date Sampled	18-Aug-21	27-Aug-21	31-Aug-21	07-Sep-21	13-Sep-21	21-Sep-21	28-Sep-21	25-Oct-21	08-Nov-21	07-Dec-21	
Lab Sample ID for analyses except bacteriological	21H2292-02	21H3419-02	21I0166-02	21I0997-02	21I1687-02	21I2987-02	21I3942-02	21J3500-02	21K1279-02	21L1220-02	
Lab Sample ID for Bacteriological samples						21I2983-02		21J3497-02	21K1276-02	21L1219-02	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
Analyte	Unit										
Field Results											
Conductivity	µS/cm					287.8		286.7	291.5	301.2	
Dissolved oxygen	mg/L					9.32		10.57	11.98	13.01	
Oxidation reduction potential	mV					70.8		80.7	60.4	133	
pH						8.55		8	8.3	7.58	
Temperature	°C					<u>16.8</u>		10.9	8.3	5	
Total dissolved solids	mg/L					187.2		186.5	189.8	195.7	
Turbidity	NTU								1.56		
Lab Results											
General											
Alkalinity (bicarbonate, as CaCO3)	mg/L							123			
Alkalinity (carbonate, as CaCO3)	mg/L							<1.0			
Alkalinity (hydroxide, as CaCO3)	mg/L							<1.0			
Alkalinity (phenolphthalein, as CaCO3)	mg/L							<1.0			
Alkalinity (total, as CaCO3)	mg/L							123			
Biochemical oxygen demand	mg/L							1			
Chemical Oxygen Demand	mg/L							15			
Chloride	mg/L					6.08		6.17	6.1	6.6	
Conductivity	µS/cm					271		275	265	280	
Fluoride	mg/L							0.13			
Hardness, Total (total as CaCO3)	mg/L					148		126	133	126	
pH						8.39		8.17	8.11	8.01	
Sulphate	mg/L					29.9		30.1	29.9	29.9	
Total suspended solids	mg/L					<2.0		<2.9	<2.0	<2.0	
Microbiological											
E. coli (MPN)	MPN/100 mL	<u>11</u>	<u>14</u>	6	1	4	<u>11</u>	5	1	3	5
Fecal coliforms (MPN)	MPN/100 mL	<u>12</u>	<u>25</u>	<u>15</u>	7	6	<u>16</u>	5	5	3	7
Nutrients											
Ammonia (total, as N)	mg/L						<0.050		<0.050	<0.050	<0.050
Nitrate (as N)	mg/L						<0.010		<0.010	<0.010	<0.010
Nitrite (as N)	mg/L						<0.010		<0.010	<0.010	<0.010
Total nitrogen	mg/L						0.237		0.235	0.238	0.378
Total kjeldahl nitrogen	mg/L						0.237		0.235	0.238	0.378
Orthophosphate (dissolved, as P)	mg/L						<0.0050		<0.0050	<0.0050	<0.0050
Phosphorus (total, APHA 4500-P)	mg/L						<0.0050		0.0164	0.0152	0.03
Phosphorus (dissolved, APHA 4500-P)	mg/L						<0.0050		<0.0050	0.009	0.0205
Potassium (total)	mg/L						3.31		2.66	2.73	2.8

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 100m Downstream
	Date Sampled	18-Aug-21	27-Aug-21	31-Aug-21	07-Sep-21	13-Sep-21	21-Sep-21	28-Sep-21	25-Oct-21	08-Nov-21
Lab Sample ID for analyses except bacteriological	21H2292-02	21H3419-02	21I0166-02	21I0997-02	21I1687-02	21I2987-02	21I3942-02	21J3500-02	21K1279-02	21L1220-02
Lab Sample ID for Bacteriological samples						21I2983-02		21J3497-02	21K1276-02	21L1219-02
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit									
Total Metals										
Aluminum (total)	mg/L							0.0389		
Antimony (total)	mg/L							<0.00020		
Arsenic (total)	mg/L							0.00056		
Barium (total)	mg/L							0.0233		
Beryllium (total)	mg/L							<0.00010		
Bismuth (total)	mg/L							<0.00010		
Boron (total)	mg/L							<0.0500		
Cadmium (total)	mg/L							<0.000010		
Calcium (total)	mg/L					38.6		34.1	35.5	32.9
Chromium (total)	mg/L							<0.00050		
Cobalt (total)	mg/L							<0.00010		
Copper (total)	mg/L							0.00127		
Iron (total)	mg/L							0.048		
Lead (total)	mg/L							<0.00020		
Lithium (total)	mg/L							0.00325		
Magnesium (total)	mg/L					12.6		9.93	10.9	10.6
Manganese (total)	mg/L							0.00637		
Mercury (total)	mg/L							<0.000010		
Molybdenum (total)	mg/L							0.00332		
Nickel (total)	mg/L							0.00091		
Selenium (total)	mg/L							<0.00050		
Silicon (total, as Si)	mg/L							3.1		
Silver (total)	mg/L							<0.000050		
Sodium (total)	mg/L					16.1		12	13.6	12.5
Strontium (total)	mg/L							0.289		
Sulphur (total)	mg/L							10.1		
Tellurium (total)	mg/L							<0.00050		
Thallium (total)	mg/L							<0.000020		
Thorium (total)	mg/L							<0.00010		
Tin (total)	mg/L							<0.00020		
Titanium (total)	mg/L							<0.0050		
Tungsten (total)	mg/L							<0.0010		
Uranium (total)	mg/L							0.00226		
Vanadium (total)	mg/L							<0.0010		
Zinc (total)	mg/L							0.0135		
Zirconium (total)	mg/L							<0.00010		

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Sampling Location	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	
		Date Sampled	20-Jan-21	17-Feb-21	17-Mar-21	20-Apr-21	05-May-21	11-May-21	18-May-21	26-May-21	02-Jun-21	09-Jun-21
Lab Sample ID for analyses except bacteriological			21A1871-03	21B1890-03	21C2548-01	21D2209-04	21E0634-03	21E1315-06	21E2189-03	21E3067-03	21F0515-03	21F1466-03
Lab Sample ID for Bacteriological samples			21A1875-03	21B1889-03	21C2549-01	21D2212-04		21E1315-05				
Sample Type			Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Field Results												
Conductivity	µS/cm		289.6	292.8	289.5	284.7		276.1				
Dissolved oxygen	mg/L		13.19	13.78	13.51	12.36		8.69				
Oxidation reduction potential	mV		68.1	68.7	58	55.7		37.8				
pH			7.98	8.05	8.21	8.21		8.47				
Temperature	°C		3.6	1.9	4.8	9.9		13.3				
Total dissolved solids	mg/L		187.9	190.5	188.5	185.2		179.4				
Turbidity	NTU		1.2	0.81	0.82			1.58				
Lab Results												
General												
Alkalinity (bicarbonate, as CaCO3)	mg/L		129			118						
Alkalinity (carbonate, as CaCO3)	mg/L		<1.0			<1.0						
Alkalinity (hydroxide, as CaCO3)	mg/L		<1.0			<1.0						
Alkalinity (phenolphthalein, as CaCO3)	mg/L		<1.0			<1.0						
Alkalinity (total, as CaCO3)	mg/L		129			118						
Biochemical oxygen demand	mg/L		<1.2			<1.3						
Chemical Oxygen Demand	mg/L		14			12						
Chloride	mg/L		6.14	5.99	6.05	5.9		5.71				
Conductivity	µS/cm		271	268	278	280		274				
Fluoride	mg/L		0.15			0.17						
Hardness, Total (total as CaCO3)	mg/L		129	133	111	114		113				
pH			8.1	8.13	8.14	8.15		8.24				
Sulphate	mg/L		29.3	28	41.7	29		27				
Total suspended solids	mg/L		3.6	4.8	<2.0	9.6		4.4				
Microbiological												
E. coli (MPN)	MPN/100 mL		<1	2	<1	4	2	8	<u>19</u>	<u>30</u>	<u>29</u>	4
Fecal coliforms (MPN)	MPN/100 mL		<1	2	<1	4	2	9	<u>19</u>	<u>32</u>	<u>31</u>	5
Nutrients												
Ammonia (total, as N)	mg/L		<0.050	<0.050	0.061	<0.050		<0.050				
Nitrate (as N)	mg/L		<0.010	<0.010	<0.010	<0.010		<0.010				
Nitrite (as N)	mg/L		<0.010	<0.010	<0.010	<0.010		<0.010				
Total nitrogen	mg/L		0.239	0.233	0.202	0.235		0.223				
Total kjeldahl nitrogen	mg/L		0.239	0.233	0.202	0.235		0.223				
Orthophosphate (dissolved, as P)	mg/L		<0.0050	<0.0050	<0.0050	<0.0050		<0.0050				
Phosphorus (total, APHA 4500-P)	mg/L		0.0145	0.0187	0.0102	0.0293		0.009				
Phosphorus (dissolved, APHA 4500-P)	mg/L		0.0058	0.0089	0.0066	<0.0050		<0.0050				
Potassium (total)	mg/L		2.99		2.29	2.44		2.46				

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream
	Date Sampled	20-Jan-21	17-Feb-21	17-Mar-21	20-Apr-21	05-May-21	11-May-21	18-May-21	26-May-21	02-Jun-21
Lab Sample ID for analyses except bacteriological	21A1871-03	21B1890-03	21C2548-01	21D2209-04	21E0634-03	21E1315-06	21E2189-03	21E3067-03	21F0515-03	21F1466-03
Lab Sample ID for Bacteriological samples	21A1875-03	21B1889-03	21C2549-01	21D2212-04		21E1315-05				
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit									
Total Metals										
Aluminum (total)	mg/L	0.0057			0.346					
Antimony (total)	mg/L	<0.00020			<0.00020					
Arsenic (total)	mg/L	0.00065			<0.00050					
Barium (total)	mg/L	0.0244			0.03					
Beryllium (total)	mg/L	<0.00010			<0.00010					
Bismuth (total)	mg/L	<0.00010			<0.00010					
Boron (total)	mg/L	<0.0500			<0.0500					
Cadmium (total)	mg/L	<0.000010			<0.000010					
Calcium (total)	mg/L	33.1	34.8	29.8	30.5	29.5				
Chromium (total)	mg/L	<u>0.00513</u>			<0.00050					
Cobalt (total)	mg/L	<0.00010			0.00017					
Copper (total)	mg/L	0.0006			0.0017					
Iron (total)	mg/L	<0.010			<u>0.344</u>					
Lead (total)	mg/L	<0.00020			<0.00020					
Lithium (total)	mg/L	0.00369			0.00367					
Magnesium (total)	mg/L	11.2	11.1	8.94	9.26	9.46				
Manganese (total)	mg/L	0.0176			<u>0.0202</u>					
Mercury (total)	mg/L	<0.000010			<0.000010					
Molybdenum (total)	mg/L	0.00341			0.0035					
Nickel (total)	mg/L	<0.00040			0.00074					
Selenium (total)	mg/L	<0.00050			<0.00050					
Silicon (total, as Si)	mg/L	3.5			2.6					
Silver (total)	mg/L	<0.000050			<0.000050					
Sodium (total)	mg/L	12.2	12.7	11	11.8	12.5				
Strontium (total)	mg/L	0.316			0.287					
Sulphur (total)	mg/L	11.7			9.8					
Tellurium (total)	mg/L	<0.00050			<0.00050					
Thallium (total)	mg/L	<0.000020			<0.000020					
Thorium (total)	mg/L	<0.00010			<0.00010					
Tin (total)	mg/L	<0.00020			<0.00020					
Titanium (total)	mg/L	<0.0050			0.0251					
Tungsten (total)	mg/L	<0.0010			<0.0010					
Uranium (total)	mg/L	0.00241			0.00268					
Vanadium (total)	mg/L	0.0019			0.0014					
Zinc (total)	mg/L	<0.0040			<0.0040					
Zirconium (total)	mg/L	<0.00010			0.00018					

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream
Date Sampled	16-Jun-21	22-Jun-21	28-Jun-21	06-Jul-21	12-Jul-21	21-Jul-21	27-Jul-21	04-Aug-21	10-Aug-21	18-Aug-21
Lab Sample ID for analyses except bacteriological	21F2437-03	21F3143-03	21F3794-03	21G0669-03	21G1376-03	21G2737-05	21G3479-03	21H0507-03	21H1185-03	21H2292-03
Lab Sample ID for Bacteriological samples	21F2430-03					21G2736-05			21H1179-03	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit									
Field Results										
Conductivity	µS/cm	274.6				285.3			287.8	
Dissolved oxygen	mg/L	9.67				7.98			7.38	
Oxidation reduction potential	mV	57.9				49.9			45.7	
pH		8.53				8.72			8.56	
Temperature	°C	<u>17.4</u>				<u>24.2</u>			<u>22.9</u>	
Total dissolved solids	mg/L	178.1				185.2			187.2	
Turbidity	NTU	1.01								
Lab Results										
General										
Alkalinity (bicarbonate, as CaCO3)	mg/L					116				
Alkalinity (carbonate, as CaCO3)	mg/L					3.2				
Alkalinity (hydroxide, as CaCO3)	mg/L					<1.0				
Alkalinity (phenolphthalein, as CaCO3)	mg/L					1.6				
Alkalinity (total, as CaCO3)	mg/L					119				
Biochemical oxygen demand	mg/L					<1.0				
Chemical Oxygen Demand	mg/L					23				
Chloride	mg/L	5.56				6.22			5.69	
Conductivity	µS/cm	<2.0				270			264	
Fluoride	mg/L					0.14				
Hardness, Total (total as CaCO3)	mg/L	117				118			116	
pH		8.29				8.38			8.41	
Sulphate	mg/L	27.7				28.3			29	
Total suspended solids	mg/L	2				<4.0			<2.0	
Microbiological										
E. coli (MPN)	MPN/100 mL	<u>13</u>	10	<u>17</u>	<u>12</u>	<u>14</u>	<u>14</u>	<u>20</u>	<u>18</u>	<u>23</u>
Fecal coliforms (MPN)	MPN/100 mL	<u>14</u>	10	<u>18</u>	<u>22</u>	<u>19</u>	<u>16</u>	<u>26</u>	<u>21</u>	<u>25</u>
Nutrients										
Ammonia (total, as N)	mg/L	<0.050				<0.050			<0.050	
Nitrate (as N)	mg/L	<0.010				<0.010			<0.010	
Nitrite (as N)	mg/L	<0.010				<0.010			<0.010	
Total nitrogen	mg/L	0.27				0.192			0.229	
Total kjeldahl nitrogen	mg/L	0.27				0.192			0.229	
Orthophosphate (dissolved, as P)	mg/L	<0.0050				<0.0050			<0.0050	
Phosphorus (total, APHA 4500-P)	mg/L	<0.0050				0.0109			0.0069	
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.0066				0.0109			<0.0050	
Potassium (total)	mg/L	2.49				2.55			2.44	

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream
	Date Sampled	16-Jun-21	22-Jun-21	28-Jun-21	06-Jul-21	12-Jul-21	21-Jul-21	27-Jul-21	04-Aug-21	10-Aug-21
Lab Sample ID for analyses except bacteriological	21F2437-03	21F3143-03	21F3794-03	21G0669-03	21G1376-03	21G2737-05	21G3479-03	21H0507-03	21H1185-03	21H2292-03
Lab Sample ID for Bacteriological samples	21F2430-03					21G2736-05			21H1179-03	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit									
Total Metals										
Aluminum (total)	mg/L					0.0088				
Antimony (total)	mg/L					<0.00020				
Arsenic (total)	mg/L					0.00053				
Barium (total)	mg/L					0.0236				
Beryllium (total)	mg/L					<0.00010				
Bismuth (total)	mg/L					<0.00010				
Boron (total)	mg/L					<0.0500				
Cadmium (total)	mg/L					<0.000010				
Calcium (total)	mg/L	31.4				31		30.6		
Chromium (total)	mg/L					<0.00050				
Cobalt (total)	mg/L					<0.00010				
Copper (total)	mg/L					0.00086				
Iron (total)	mg/L					0.015				
Lead (total)	mg/L					<0.00020				
Lithium (total)	mg/L					0.0036				
Magnesium (total)	mg/L	9.31				9.83		9.57		
Manganese (total)	mg/L					0.00602				
Mercury (total)	mg/L					<0.000010				
Molybdenum (total)	mg/L					0.00317				
Nickel (total)	mg/L					0.00045				
Selenium (total)	mg/L					0.00056				
Silicon (total, as Si)	mg/L					3.2				
Silver (total)	mg/L					<0.000050				
Sodium (total)	mg/L	12.2				12.8		12.7		
Strontium (total)	mg/L					0.289				
Sulphur (total)	mg/L					9				
Tellurium (total)	mg/L					<0.00050				
Thallium (total)	mg/L					<0.000020				
Thorium (total)	mg/L					<0.00010				
Tin (total)	mg/L					<0.00020				
Titanium (total)	mg/L					<0.0050				
Tungsten (total)	mg/L					<0.0010				
Uranium (total)	mg/L					0.0025				
Vanadium (total)	mg/L					<0.0010				
Zinc (total)	mg/L					<0.0040				
Zirconium (total)	mg/L					<0.00010				

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	
Date Sampled	27-Aug-21	31-Aug-21	07-Sep-21	13-Sep-21	21-Sep-21	28-Sep-21	25-Oct-21	08-Nov-21	07-Dec-21	
Lab Sample ID for analyses except bacteriological	21H3419-03	21I0166-03	21I0997-03	21I1687-03	21I2987-03	21I3942-03	21J3500-03	21K1279-03	21L1220-03	
Lab Sample ID for Bacteriological samples					21I2983-03		21J3497-03	21K1276-03	21L1219-03	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
Analyte	Unit									
Field Results										
Conductivity	µS/cm				287		287.3	289.3	295.3	
Dissolved oxygen	mg/L				9.77		10.49	12.05	12.65	
Oxidation reduction potential	mV				67.1		72.7	60.5	122.8	
pH					8.61		8.19	8.32	7.72	
Temperature	°C				<u>16.7</u>		11	8.2	4.9	
Total dissolved solids	mg/L				186.5		186.5	187.9	191.7	
Turbidity	NTU							1.37		
Lab Results										
General										
Alkalinity (bicarbonate, as CaCO3)	mg/L						122			
Alkalinity (carbonate, as CaCO3)	mg/L						<1.0			
Alkalinity (hydroxide, as CaCO3)	mg/L						<1.0			
Alkalinity (phenolphthalein, as CaCO3)	mg/L						<1.0			
Alkalinity (total, as CaCO3)	mg/L						122			
Biochemical oxygen demand	mg/L						<1.0			
Chemical Oxygen Demand	mg/L						11			
Chloride	mg/L				6.12		5.96	6.07	6.55	
Conductivity	µS/cm				270		274	261	282	
Fluoride	mg/L						0.13			
Hardness, Total (total as CaCO3)	mg/L				115		124	127	128	
pH					8.43		8.17	8.19	8.02	
Sulphate	mg/L				29.9		29.6	29.6	29.4	
Total suspended solids	mg/L				10.8		<3.3	<2.0	<2.0	
Microbiological										
E. coli (MPN)	MPN/100 mL	<u>25</u>	<u>12</u>	4	<u>15</u>	4	3	<u>49</u>	3	4
Fecal coliforms (MPN)	MPN/100 mL	<u>31</u>	<u>12</u>	<u>11</u>	<u>20</u>	7	3	<u>50</u>	3	8
Nutrients										
Ammonia (total, as N)	mg/L				<0.050		<0.050	<0.050	<0.050	
Nitrate (as N)	mg/L				<0.010		<0.010	<0.010	<0.010	
Nitrite (as N)	mg/L				<0.010		<0.010	<0.010	<0.010	
Total nitrogen	mg/L				0.253		0.354	0.22	0.28	
Total kjeldahl nitrogen	mg/L				0.253		0.354	0.22	0.28	
Orthophosphate (dissolved, as P)	mg/L				<0.0050		<0.0050	<0.0050	<0.0050	
Phosphorus (total, APHA 4500-P)	mg/L				0.0061		0.0114	0.0197	0.0312	
Phosphorus (dissolved, APHA 4500-P)	mg/L				<0.0050		0.006	0.0112	0.0234	
Potassium (total)	mg/L				2.58		2.42	2.71	2.89	

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream	Okanagan River Channel 500m Downstream
Date Sampled	27-Aug-21	31-Aug-21	07-Sep-21	13-Sep-21	21-Sep-21	28-Sep-21	25-Oct-21	08-Nov-21	07-Dec-21
Lab Sample ID for analyses except bacteriological	21H3419-03	21I0166-03	21I0997-03	21I1687-03	21I2987-03	21I3942-03	21J3500-03	21K1279-03	21L1220-03
Lab Sample ID for Bacteriological samples					21I2983-03		21J3497-03	21K1276-03	21L1219-03
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Analyte	Unit								
Total Metals									
Aluminum (total)	mg/L						0.0184		
Antimony (total)	mg/L						<0.00020		
Arsenic (total)	mg/L						0.00053		
Barium (total)	mg/L						0.0219		
Beryllium (total)	mg/L						<0.00010		
Bismuth (total)	mg/L						<0.00010		
Boron (total)	mg/L						<0.0500		
Cadmium (total)	mg/L						<0.000010		
Calcium (total)	mg/L				29.9		33.2	33.5	33.3
Chromium (total)	mg/L						<0.00050		
Cobalt (total)	mg/L						<0.00010		
Copper (total)	mg/L						0.0189		
Iron (total)	mg/L						0.019		
Lead (total)	mg/L						<0.00020		
Lithium (total)	mg/L						0.00359		
Magnesium (total)	mg/L				9.83		10	10.5	10.7
Manganese (total)	mg/L						0.00516		
Mercury (total)	mg/L						<0.000010		
Molybdenum (total)	mg/L						0.00322		
Nickel (total)	mg/L						<0.00040		
Selenium (total)	mg/L						<0.00050		
Silicon (total, as Si)	mg/L						3.2		
Silver (total)	mg/L						<0.000050		
Sodium (total)	mg/L				12.8		12.7	13.4	13.2
Strontium (total)	mg/L						0.274		
Sulphur (total)	mg/L						9.7		
Tellurium (total)	mg/L						<0.00050		
Thallium (total)	mg/L						<0.000020		
Thorium (total)	mg/L						<0.00010		
Tin (total)	mg/L						<0.00020		
Titanium (total)	mg/L						<0.0050		
Tungsten (total)	mg/L						<0.0010		
Uranium (total)	mg/L						0.0025		
Vanadium (total)	mg/L						<0.0010		
Zinc (total)	mg/L						<0.0040		
Zirconium (total)	mg/L						<0.00010		

Appendix Q

Okanagan Falls Advanced Wastewater Treatment Facility
Water Quality Results

Analyte	Unit	Guideline														
		BCAWQG AL (LT)	BCWWQG AL	BCAWQG AL (ST)	GCDWQ MAC	GCDWQ AO	BCAWQG L	BCWWQG L	BCAWQG I	BCWWQG I	BCSDWQG MAC	BCSDWQG AQ	CSR AW	CSR IW	CSR LW	CSR DW
Field Results																
Conductivity	µS/cm	NG	NG	NG	NG	NG	NG	NG	NG	700 ^{9.1}	NG	NG	NG	NG	NG	NG
Dissolved oxygen	mg/L	min 8 ^{1.1}	NG	min 5 ^{3.1}	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Oxidation reduction potential	mV	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
pH		N ^{1.2}	NG	NG	NG	7.0 - 10.5 ^{5.1}	5.0 - 9.5 ^{6.1}	NG	5.0 - 9.5 ^{8.1}	NG	NG	NG	NG	NG	NG	NG
Temperature	°C	NG	NG	19 ^{3.2}	NG	15	N ^{6.2}	NG	N ^{8.2}	NG	NG	15	NG	NG	NG	NG
Total dissolved solids	mg/L	NG	NG	NG	NG	500	NG	1000 ^{7.1}	NG	500 ^{9.2}	NG	NG	NG	NG	NG	NG
Turbidity	NTU	N ^{1.3}	NG	N ^{3.3}	N ^{4.1}	NG	N ^{6.3}	NG	N ^{8.3}	NG	N ^{10.1}	NG	NG	NG	NG	NG
Lab Results																
General																
Alkalinity (bicarbonate, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Alkalinity (carbonate, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Alkalinity (hydroxide, as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Alkalinity (phenolphthalein, as CaCO3)	mg/L	NG	N ^{2.1}	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Alkalinity (total, as CaCO3)	mg/L	NG	N ^{2.2}	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Biochemical oxygen demand	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Chemical Oxygen Demand	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Chloride	mg/L	150 ^{1.4}	NG	600 ^{3.4}	NG	250	600 ^{6.4}	NG	100	NG	NG	250	1500	100 ^{13.1}	600	250 ^{15.1}
Conductivity	µS/cm	NG	NG	NG	NG	NG	NG	NG	NG	700 ^{9.3}	NG	NG	NG	NG	NG	NG
Fluoride	mg/L	NG	NG	Calc ^{3.5}	1.5	NG	1.5 ^{6.5}	NG	2.0 ^{8.4}	NG	1.5	NG	Calc ^{12.1}	1.000	1.000 ^{14.1}	1.500
Hardness, Total (total as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
pH		N ^{1.5}	NG	NG	NG	7.0 - 10.5 ^{5.2}	5.0 - 9.5 ^{6.6}	NG	5.0 - 9.5 ^{8.5}	NG	NG	NG	NG	NG	NG	NG
Sulphate	mg/L	Calc ^{1.6}	NG	NG	NG	500 ^{5.3}	1000	1000 ^{7.2}	NG	NG	NG	500	Calc ^{12.2}	NG	1000	500 ^{15.2}
Total suspended solids	mg/L	N ^{1.7}	NG	N ^{3.6}	NG	NG	N ^{6.7}	NG	N ^{8.6}	NG	NG	NG	NG	NG	NG	NG
Microbiological																
E. coli (MPN)	MPN/100 mL	N ^{1.8}	NG	NG	0 ^{4.2}	NG	200 ^{6.8}	NG	385 ^{8.7}	NG	10 ^{10.2}	NG	NG	NG	NG	NG
Fecal coliforms (MPN)	MPN/100 mL	N ^{1.9}	NG	NG	0 ^{4.3}	NG	200 ^{6.9}	NG	1000 ^{8.8}	NG	10 ^{10.3}	NG	NG	NG	NG	NG
Nutrients																
Ammonia (total, as N)	mg/L	Calc ^{1.10}	NG	Calc ^{3.7}	NG	NG	NG	NG	NG	NG	NG	NG	Calc ^{12.3}	NG	NG	NG
Nitrate (as N)	mg/L	3.0 ^{1.11}	NG	32.8 ^{3.8}	10	NG	100 ^{6.10}	NG	NG	NG	10	NG	400 ^{12.4}	NG	100 ^{14.2}	10 ^{15.3}
Nitrate + Nitrite (as N)	mg/L	NG	NG	NG	10 ^{4.4}	NG	100 ^{6.11}	NG	NG	NG	NG	NG	400 ^{12.5}	NG	100 ^{14.3}	10 ^{15.4}
Nitrate + Nitrite (as N) (calculated)	mg/L	NG	NG	NG	10 ^{4.5}	NG	100 ^{6.12}	NG	NG	NG	NG	NG	400 ^{12.6}	NG	100 ^{14.4}	10 ^{15.5}
Nitrite (as N)	mg/L	Calc ^{1.12}	NG	Calc ^{3.9}	1	NG	10 ^{6.13}	NG	NG	NG	1.0	NG	Calc ^{12.7}	NG	10.000	1
Total nitrogen	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Total kjeldahl nitrogen	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Orthophosphate (dissolved, as P)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Phosphorus (total, APHA 4500-P)	mg/L	N ^{1.14}	NG	NG	NG	NG	NG	NG	NG	NG	NG	N ^{11.2}	NG	NG	NG	NG
Phosphorus (dissolved, APHA 4500-P)	mg/L	N ^{1.15}	NG	NG	NG	NG	NG	NG	NG	NG	NG	N ^{11.3}	NG	NG	NG	NG
Potassium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG

Okanagan Falls Advanced Wastewater Treatment Facility
Water Quality Results

Analyte	Unit	Guideline														
		BCAWQG AL (LT)	BCWWQG AL	BCAWQG AL (ST)	GCDWQ MAC	GCDWQ AO	BCAWQG L	BCWWQG L	BCAWQG I	BCWWQG I	BCSDWQG MAC	BCSDWQG AQ	CSR AW	CSR IW	CSR LW	CSR DW
Total Metals																
Aluminum (total)	mg/L	NG	NG	NG	2.9 ^{4.6}	0.100 ^{5.4}	5 ^{6.14}	NG	5 ^{8.9}	NG	9.5	NG	NG	5.000	5.000	9.500 ^{15.6}
Antimony (total)	mg/L	NG	0.009 ^{2.3}	NG	0.006	NG	NG	NG	NG	NG	0.006	NG	0.090	NG	NG	0.006
Arsenic (total)	mg/L	0.005 ^{1.16}	NG	NG	0.010 ^{4.7}	NG	0.025 ^{6.15}	NG	0.100 ^{8.10}	NG	0.01	NG	0.050	0.100	0.025	0.010
Barium (total)	mg/L	NG	1	NG	2.0 ^{4.8}	NG	NG	NG	NG	NG	NG	NG	10.000	NG	NG	1.000
Beryllium (total)	mg/L	NG	0.00013	NG	NG	NG	NG	0.100	NG	0.100	NG	NG	0.0015	0.100	0.100	0.008
Bismuth (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Boron (total)	mg/L	1.2 ^{1.17}	NG	NG	5	NG	5	NG	0.5 ^{8.11}	NG	5.0	NG	12.000	0.500 ^{13.2}	5.000	5.000
Cadmium (total)	mg/L	NG	NG	NG	0.007 ^{4.9}	NG	NG	0.080 ^{7.3}	NG	0.0051 ^{9.4}	0.005	NG	Calc ^{12.8}	0.005	0.080	0.005
Calcium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	1000	NG
Chromium (total)	mg/L	NG	0.001 ^{2.4}	NG	0.05	NG	NG	0.050 ^{7.4}	NG	0.0049 ^{9.5}	0.05	NG	0.010 ^{12.9}	0.005 ^{13.3}	0.050 ^{14.5}	0.050 ^{15.7}
Cobalt (total)	mg/L	0.004 ^{1.18}	NG	0.110 ^{3.10}	NG	NG	NG	1	NG	0.050 ^{9.6}	0.001	NG	0.040	0.050	1.000	0.001
Copper (total)	mg/L	NG	NG	NG	2 ^{4.10}	1	0.300	NG	0.200 ^{8.12}	NG	2.0 ^{10.4}	1.0	Calc ^{12.10}	0.200	0.300	1.500 ^{15.8}
Iron (total)	mg/L	NG	NG	1 ^{3.11}	NG	0.3	NG	NG	NG	NG	NG	0.3	NG	5.000 ^{13.4}	NG	6.500 ^{15.9}
Lead (total)	mg/L	Calc ^{1.19}	NG	Calc ^{3.12}	0.005 ^{4.11}	NG	0.100	NG	0.200 ^{8.13}	NG	0.005	NG	Calc ^{12.11}	0.200	0.100	0.010
Lithium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	0.75 ^{9.7}	NG	NG	NG	2.500 ^{13.5}	5.000	0.008
Magnesium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Manganese (total)	mg/L	Calc ^{1.20}	NG	Calc ^{3.13}	0.12 ^{4.12}	0.02 ^{5.5}	NG	NG	NG	0.200	0.12	0.02	NG	0.200 ^{13.6}	NG	1.500 ^{15.10}
Mercury (total)	mg/L	0.00002 ^{1.21}	NG	NG	0.001	NG	0.0030	NG	0.0020	NG	0.001	NG	0.00025	0.001	0.002	0.001
Molybdenum (total)	mg/L	7.6	NG	46	NG	NG	0.016 ^{6.16}	NG	0.01 ^{8.14}	NG	0.088	NG	10.000	0.010 ^{13.7}	0.050	0.250
Nickel (total)	mg/L	NG	Calc ^{2.5}	NG	NG	NG	NG	1	NG	0.200	0.08	NG	Calc ^{12.12}	0.200	1.000	0.080
Selenium (total)	mg/L	0.002 ^{1.22}	NG	NG	0.05	NG	0.0300 ^{6.17}	NG	0.010 ^{8.15}	NG	0.01	NG	0.020	0.020 ^{13.8}	0.030	0.010
Silicon (total, as Si)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Silver (total)	mg/L	Calc ^{1.23}	NG	Calc ^{3.14}	NG	NG	NG	NG	NG	NG	NG	NG	Calc ^{12.13}	NG	NG	0.020
Sodium (total)	mg/L	NG	NG	NG	NG	200	NG	NG	NG	NG	NG	NG	NG	NG	NG	200 ^{15.11}
Strontium (total)	mg/L	NG	NG	NG	7.0 ^{4.13}	NG	NG	NG	NG	NG	7.0	NG	NG	NG	NG	2.500
Sulphur (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Tellurium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Thallium (total)	mg/L	NG	0.0008 ^{2.6}	NG	NG	NG	NG	NG	NG	NG	NG	NG	0.003	NG	NG	NG
Thorium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Tin (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	2.500
Titanium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	1.000	NG	NG	NG
Tungsten (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	0.003
Uranium (total)	mg/L	NG	0.0085	NG	0.02	NG	NG	0.200	NG	0.010	0.02	NG	0.085	0.010	0.200	0.020
Vanadium (total)	mg/L	NG	NG	NG	NG	NG	NG	0.100	NG	0.100	NG	NG	NG	0.100	0.100	0.020
Zinc (total)	mg/L	Calc ^{1.24}	NG	Calc ^{3.15}	NG	5.0	2.000	NG	1.000 ^{8.16}	NG	3.0	5.0	Calc ^{12.14}	1.000 ^{13.9}	2.000	3.000 ^{15.12}
Zirconium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG

Guideline Notes for Reports for RDOS Landfill and Wastewater Treatment Sites Water Quality Results**1. Notes for BC Approved Water Quality Guidelines for freshwater aquatic life (Long-term chronic) (BCAQG AL (LT))****General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports. / There are two types of water quality guidelines: the short-term acute guideline (i.e. maximum), and the long-term chronic guideline (i.e. average). Only the long-term chronic guidelines are included in this criteria set.

Note 1.1 for Dissolved oxygen:

The aquatic life long-term chronic guideline (minimum) for dissolved oxygen is 8 mg/L for all life stages other than buried embryo/alevin. The 30-day mean guideline (minimum) for dissolved oxygen in the water column is 11 mg/L for buried embryo/alevin. The 30-day mean guideline (minimum) for dissolved oxygen in interstitial water is 8 mg/L for buried embryo/alevin.

Note 1.2 for pH:

The freshwater aquatic life long-term chronic guideline is:

pH less than 6.5: No statistically significant decrease in pH from background;

pH from 6.5 to 9.0: Unrestricted change permitted within this range;

pH over 9.0: No statistically significant increase in pH from background.

See BC MOE Overview Report for additional details.

Note 1.3 for Turbidity:

Aquatic life guidelines for turbidity are:

Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters;

Change from background of 2 NTU at any one time for a duration of 30 d in all waters during clear flows or in clear waters;

Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters;

Change from background of 10% when background is > 50 NTU at any time during high flows or in turbid waters.

Note 1.4 for Chloride:

To protect freshwater aquatic life from chronic effects, the average (arithmetic mean computed from five weekly samples collected over a 30-day period) concentration of chloride (mg/L as NaCl) should not exceed 150 mg/L. When ambient chloride concentrations exceed guidelines, increases in chloride due to human activities should be avoided.

Note 1.5 for pH:

The freshwater aquatic life long-term chronic guideline is:

pH less than 6.5: No statistically significant decrease in pH from background;

pH from 6.5 to 9.0: Unrestricted change permitted within this range;

pH over 9.0: No statistically significant increase in pH from background.

See BC MOE Overview Report for additional details.

Note 1.6 for Sulphate:

The freshwater aquatic life long-term chronic guideline is:

128 mg/L at hardness of 0 to 30 mg/L as CaCO₃

218 mg/L at hardness of 31 to 75 mg/L as CaCO₃

309 mg/L at hardness of 76 to 180mg/L as CaCO₃

429 mg/L at hardness 181 to 250 mg/L as CaCO₃

Need to determine guideline based on site water for hardness greater than 250 mg/L as CaCO₃.

For screening purposes in this report, exceedance were flagged for sulphate greater than 429 mg/L at hardness greater than 250 mg/L as CaCO₃.

Note 1.7 for Total suspended solids:

Aquatic life guidelines for total suspended solids are:

Change from background of 25 mg/L at any one time for a duration of 24 h in all waters during clear flows or in clear waters;

Change from background of 5 mg/L at any one time for a duration of 30 d in all waters during clear flows or in clear waters;

Change from background of 10 mg/L at any time when background is 25 - 100 mg/L during high flows or in turbid waters;

Change from background of 10% when background is > 100 mg/L at any time during high flows or in turbid waters.

Note 1.8 for E. coli (MPN):

There are insufficient data to set criteria for microbiological indicators for the protection of the health of aquatic organisms. The criteria below are for fresh or marine waters used for the growth and harvesting of shellfish for human consumption where the shellfish may be eaten raw and are used directly without a cleansing period prior to killing.

The escherichia coli density in fresh and marine waters used for the growing and harvesting of shellfish for human consumption should not exceed a median MPN of 14/100 mL over 30 days, and at least 90% of the samples in a 30-day period should not exceed 43/100 mL.

Note 1.9 for Fecal coliforms (MPN):

There are insufficient data to set criteria for microbiological indicators for the protection of the health of aquatic organisms. The criteria below are for fresh or marine waters used for the growth and harvesting of shellfish for human consumption where the shellfish may be eaten raw and are used directly without a cleansing period prior to killing.

The fecal coliform density in fresh and marine waters used for the growing and harvesting of shellfish for human consumption should not exceed a median MPN of 14/100 mL over 30 days, and at least 90% of the samples in a 30-day period should not exceed 43/100 mL.

Note 1.10 for Ammonia (total, as N):

The freshwater aquatic life long-term chronic guideline for ammonia varies as a function of pH and temperature. See Table 4 in Overview Report Update September 2009. / The lab pH and field temperature results were used for determining the maximum ammonia concentration for this report. If a lab pH result was not available then the field pH result was used.

Note 1.11 for Nitrate (as N):

Freshwater aquatic life long-term chronic guideline.

Note 1.12 for Nitrite (as N):

The freshwater aquatic life long-term chronic guideline for nitrite as N is:

0.02 mg/L if chloride less than 2 mg/L

0.04 mg/L if chloride is 2 to 4 mg/L

0.06 mg/L if chloride is 4 to 6 mg/L

0.08 mg/L if chloride is 6 to 8 mg/L

0.10 mg/L if chloride is 8 to 10 mg/L

0.20 mg/L if chloride is greater than 10 mg/L.

Note 1.13 for Phosphorus (total, by ICPMS/ICPOES):

Streams: None proposed for streams.

Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

Note 1.14 for Phosphorus (total, APHA 4500-P):

Streams: None proposed for streams.

Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

Note 1.15 for Phosphorus (dissolved, APHA 4500-P):

Streams: None proposed for streams.

Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

Note 1.16 for Arsenic (total):

Freshwater aquatic life long-term chronic guideline.

Note 1.17 for Boron (total):

Aquatic life long-term chronic guideline.

Note 1.18 for Cobalt (total):

Freshwater aquatic life long-term chronic guideline.

Note 1.19 for Lead (total):

The freshwater aquatic life long-term chronic guideline for total lead in water is: when water hardness exceeds 8 mg/L as CaCO₃, the guideline is less than or equal to $3.31 + \exp(1.273 \ln(\text{mean hardness}) - 4.704)$. In addition, no more than 20% (e.g. 1 in 5) of values in a 30-day period should exceed 1.5 times the long-term chronic guideline. The guideline applies to water hardness between 8 – 360 mg/L (as CaCO₃). If natural levels exceed the guideline, then any allowed increase in total lead above natural levels should be based on site-specific data. When water hardness exceeds highest hardness tested (i.e. upper bound), a site-specific assessment may be required. For hardness less than or equal to 8 mg/L there is no long-term chronic guideline. The short-term acute guideline of 3.0 µg/L is used for this case.

Note 1.20 for Manganese (total):

The freshwater aquatic life long-term chronic guideline for total manganese in mg/L is determined by the following relationship:

$0.0044 \text{ hardness} + 0.605$

where water hardness is reported as mg/L of CaCO₃.

The guideline applies to water hardness between 37 – 450 mg/L CaCO₃. When water hardness is outside hardness range tested (i.e. lower or upper bound), a site-specific assessment may be required.

Note 1.21 for Mercury (total):

The aquatic life long-term chronic guideline for total mercury for aquatic life is based on the formula $0.0001 / (\text{MeHg}/\text{total Hg})$, where MeHg is mass (or concentration) of methyl mercury and total Hg is total mass (or concentration) of mercury in a given water volume.

The guideline is 0.02 µg/L when the methyl mercury (MeHg) constitutes less than or equal to 0.5% of the total mercury concentration. When the proportion of MeHg is greater than 0.5%, the guideline should be adjusted. Reference: Ambient Water Quality Guidelines for Mercury: Overview Report – First Update (2001).

Note 1.22 for Selenium (total):

Aquatic life long-term chronic guideline. The 30-day average water quality guideline for protection of aquatic life is 2 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.

Note 1.23 for Silver (total):

The freshwater aquatic life long-term chronic guideline for total silver is:

0.05 µg/L as 30-day mean if hardness less than or equal to 100 mg/L

1.5 µg/L as 30-day mean if hardness greater than 100 mg/L.

Note 1.24 for Zinc (total):

The freshwater aquatic life long-term chronic guideline for total zinc (µg/L) at any time should not exceed 7.5 µg/L when water hardness is less than or equal to 90 mg/L as CaCO₃.

When water hardness is less than or equal to 90 mg/L as CaCO₃ the guideline is 7.5 µg/L;

When water hardness exceeds 90 mg/L CaCO₃, the guideline in µg/L for total zinc is the value determined by the following relationship:

$7.5 + 0.75 * (\text{hardness} - 90)$

where water hardness is reported as mg/L of CaCO₃.

The long-term chronic guideline formula applies to water hardness between 90 – 330 mg/L CaCO₃.

2. Notes for BC Working Water Quality Guidelines for Freshwater Aquatic Life (2020) (BCWWQG AL)**General Notes:**

Reference: B.C. Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (2021). WWQG values are long-term (i.e. average) concentrations unless identified as a short-term maximum in the “Notes” for a specific analyte. Long-term WWQGs represent average substance concentrations calculated from 5 samples in 30 days. WWQG are given for total substance concentrations unless otherwise noted.

Note 2.1 for Alkalinity (phenolphthalein, as CaCO₃):

The guideline for alkalinity (total as CaCO₃) is as follows:

- Less than 10 mg/L, highly sensitive to acid inputs
- 10 to 20 mg/L, moderately sensitive to acid inputs
- Greater than 20 mg/L, low sensitivity to acid inputs.

Sensitivity to acid inputs can be determined by the concentration of dissolved calcium: < 4 mg/L is highly sensitive to acid inputs; 4 to 8 mg/L is moderately sensitive; and > 8 mg/L is low sensitivity.

Note 2.2 for Alkalinity (total, as CaCO₃):

The guideline for alkalinity (total as CaCO₃) is as follows:

- Less than 10 mg/L, highly sensitive to acid inputs
- 10 to 20 mg/L, moderately sensitive to acid inputs
- Greater than 20 mg/L, low sensitivity to acid inputs.

Sensitivity to acid inputs can be determined by the concentration of dissolved calcium: < 4 mg/L is highly sensitive to acid inputs; 4 to 8 mg/L is moderately sensitive; and > 8 mg/L is low sensitivity.

Note 2.3 for Antimony (total):

The guideline is for antimony (III).

Note 2.4 for Chromium (total):

The guideline for Cr(VI) is 1 µg/L (total). The guideline for Cr(III) is 8.9 µg/L (total). The guideline of 1 µg/L for Cr(VI) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 2.5 for Nickel (total):

The guideline for nickel in µg/L is determined as follows:

When the water hardness is 0 to ≤ 60 mg/L, the maximum is 25 µg/L

At hardness > 60 to ≤ 180 mg/L the maximum is calculated using the equation:

e raised to the power of $\{0.76[\ln(\text{hardness})] + 1.06\}$

At hardness >180 mg/L, the maximum is 150 µg/L

Where water hardness is reported as mg/L CaCO₃.

If the water hardness is unknown, the maximum is 25 µg/L.

Note 2.6 for Thallium (total):

30-day average, site-specific objective for the lower Columbia River, BC

3. Notes for BC Approved Water Quality Guidelines for freshwater aquatic life (Short-term acute) (BCAWQG AL (ST))**General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports. / There are two types of water quality guidelines: the short-term acute guideline (i.e. maximum), and the long-term chronic guideline (i.e. average). Only the short-term acute guidelines are included in this criteria set.

Note 3.1 for Dissolved oxygen:

The aquatic life instantaneous minimum guideline for dissolved oxygen is 5 mg/L for all life stages other than buried embryo/alevin. The instantaneous minimum guideline for dissolved oxygen in the water column is 9 mg/L for buried embryo/alevin. The instantaneous minimum guideline for dissolved oxygen in interstitial water is 6 mg/L for buried embryo/alevin.

Note 3.2 for Temperature:

The freshwater aquatic life guideline for streams with unknown fish distribution is:

Maximum daily temperature of 19 degrees Celsius;

MWMT = 18 degrees Celsius. (MWMT, mean weekly short-term temperature, is defined as the average of the warmest daily short-term temperatures for 7 consecutive days;

Hourly rate of change not to exceed 1 degree Celsius;

Short-term incubation temperature = 12 degrees Celsius (in spring and fall).

See BC MOE Overview Report for additional details for streams with unknown fish distribution, and specific guidelines for streams with known fish distribution, and guideline for lakes and impoundments.

Note 3.3 for Turbidity:

Aquatic life guidelines for turbidity are:

Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters;

Change from background of 2 NTU at any one time for a duration of 30 d in all waters during clear flows or in clear waters;

Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters;

Change from background of 10% when background is > 50 NTU at any time during high flows or in turbid waters.

Note 3.4 for Chloride:

To protect freshwater aquatic life from acute and lethal effects, the maximum concentration of chloride (mg/L as NaCl) at any time should not exceed 600 mg/L. When ambient chloride concentrations exceed guidelines, increases in chloride due to human activities should be avoided.

Note 3.5 for Fluoride:

The freshwater aquatic life short-term acute Interim guideline for total fluoride is as follows:

If hardness is less than or equal to 10 mg/L then the guideline is 0.4 mg/L;

If hardness is greater than 10 mg/L then the guideline (in units mg/L) is based on the equation: $WQG = [-51.73 + 92.57 \log_{10}(\text{hardness})] \times 0.01$.

Hardness is as CaCO₃ in units mg/L.

The equation applies to water hardness (as CaCO₃) between 10 – 385 mg/L, and is an interim WQG until carefully controlled experiments can determine the appropriate levels of fluoride under various combinations of water temperature and hardness. When water hardness exceeds highest hardness tested (i.e. upper bound), a site-specific assessment may be required.

Note 3.6 for Total suspended solids:

Aquatic life guidelines for total suspended solids are:

Change from background of 25 mg/L at any one time for a duration of 24 h in all waters during clear flows or in clear waters;

Change from background of 5 mg/L at any one time for a duration of 30 d in all waters during clear flows or in clear waters;

Change from background of 10 mg/L at any time when background is 25 - 100 mg/L during high flows or in turbid waters;

Change from background of 10% when background is > 100 mg/L at any time during high flows or in turbid waters.

Note 3.7 for Ammonia (total, as N):

The freshwater aquatic life short-term acute guideline for ammonia varies as a function of pH and temperature. See Table 3 in Overview Report Update September 2009. / The lab pH and field temperature results were used for determining the maximum ammonia for this report. If a lab pH result was not available then the field pH result was used.

Note 3.8 for Nitrate (as N):

Freshwater aquatic life short-term acute guideline.

Note 3.9 for Nitrite (as N):

The freshwater aquatic life short-term acute guideline for nitrite as N is:

0.06 mg/L if chloride less than 2 mg/L

0.12 mg/L if chloride is 2 to 4 mg/L

0.18 mg/L if chloride is 4 to 6 mg/L

0.24 mg/L if chloride is 6 to 8 mg/L

0.30 mg/L if chloride is 8 to 10 mg/L

0.60 mg/L if chloride is greater than 10 mg/L.

Note 3.10 for Cobalt (total):

Freshwater aquatic life short-term acute guideline.

Note 3.11 for Iron (total):

Freshwater aquatic life short-term acute guideline.

Note 3.12 for Lead (total):

The freshwater aquatic life short-term acute guideline for total lead in water, at a water hardness less than or equal to 8 mg/L as CaCO₃ is 3 µg/L. When water hardness exceeds 8 mg/L (as CaCO₃) the short-term acute guideline (µg/L) is given by the following equation: $\exp(1.273 \ln(\text{hardness}) - 1.460)$.

The guideline applies to water hardness up to 360 mg/L (as CaCO₃). If natural levels exceed the guideline, then any allowed increase in total lead above natural levels should be based on site-specific data. When water hardness exceeds highest hardness tested (i.e. upper bound), a site-specific assessment may be required.

Note 3.13 for Manganese (total):

The freshwater aquatic life short-term acute guideline for total manganese in mg/L is determined by the following relationship:

$0.01102 \text{ hardness} + 0.54$

where water hardness is reported as mg/L of CaCO₃.

The guideline applies to water hardness between 25 – 259 mg/L CaCO₃. When water hardness is outside hardness range tested (i.e. lower or upper bound), a site-specific assessment may be required.

Note 3.14 for Silver (total):

The freshwater aquatic life short-term acute guideline for total silver is:

0.1 µg/L maximum if hardness less than or equal to 100 mg/L

3.0 µg/L maximum if hardness greater than 100 mg/L.

Note 3.15 for Zinc (total):

The freshwater aquatic life short-term acute guideline for total zinc (µg/L) is:

When water hardness is less than or equal to 90 mg/L as CaCO₃ the guideline is 33 µg/L;

When water hardness exceeds 90 mg/L CaCO₃, the guideline in µg/L for total zinc is the value determined by the following relationship:

$33 + 0.75 * (\text{hardness} - 90)$

where water hardness is reported as mg/L of CaCO₃.

The short-term acute guideline formula applies to water hardness between 90 – 500 mg/L CaCO₃.

4. Notes for Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations (GCDWQ MAC)**Note 4.1 for Turbidity:**

Waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source water to meet health-based turbidity limits, as defined for specific treatment technologies. Where possible, filtration systems should be designed and operated to reduce turbidity levels as low as possible, with a treated water turbidity target of less than 0.1 NTU at all times. Where this is not achievable, the treated water turbidity levels from individual filters should meet the requirements described in GCDWQ.

For systems that use groundwater that is not under the direct influence of surface water, which are considered less vulnerable to faecal contamination, turbidity should generally be below 1.0 NTU.

For effective operation of the distribution system, it is good practice to ensure that water entering the distribution system has turbidity levels below 1.0 NTU.

Note 4.2 for E. coli (MPN):

MAC is none detectable per 100 mL

Note 4.3 for Fecal coliforms (MPN):

The GCDWQ does not have a guideline for fecal coliforms. The GCDWQ were revised in 2006 when the guideline for fecal coliforms was deleted, and a guideline for E. coli was added. However the GCDWQ has a guideline for total coliforms that includes the following statement: "The maximum acceptable concentration (MAC) of total coliforms in water leaving a treatment plant and in non-disinfected groundwater leaving the well is none detectable per 100 mL." Therefore a guideline of none detectable per 100 mL was used for fecal coliforms for this report.

Note 4.4 for Nitrate + Nitrite (as N):

The MAC for Nitrate (as N) is 10 mg/L

Note 4.5 for Nitrate + Nitrite (as N) (calculated):

The MAC for Nitrate (as N) is 10 mg/L

Note 4.6 for Aluminum (total):

The maximum acceptable concentration (MAC) for total aluminum in drinking water is 2.9 mg/L (2 900 µg/L) based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. (Update March 5, 2021)

Note 4.7 for Arsenic (total):

Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 4.8 for Barium (total):

Update January 24, 2020. The MAC was revised from 1.0 mg/L to 2.0 mg/L.

Note 4.9 for Cadmium (total):

A maximum acceptable concentration (MAC) of 0.007 mg/L (7 µg/L) is established for total cadmium in drinking water, based on a sample of water taken at the tap. (Update July 14, 2020)

Note 4.10 for Copper (total):

A maximum acceptable concentration (MAC) of 2 mg/L is established for total copper in drinking water, based on a sample of water taken at the tap. Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on Copper, June 2019.

Note 4.11 for Lead (total):

The maximum acceptable concentration (MAC) for total lead in drinking water is 0.005 mg/L (5 µg/L), based on a sample of water taken at the tap and using the appropriate protocol for the type of building being sampled. Every effort should be made to maintain lead levels in drinking water as low as reasonably achievable (or ALARA). (GCDWQ: Guideline Technical Document; March, 2019)

Note 4.12 for Manganese (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

Note 4.13 for Strontium (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on strontium, May 2019.

5. Notes for Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO)**Note 5.1 for pH:**

The operational guideline for pH is a range of 7.0 to 10.5 in finished drinking water.

Note 5.2 for pH:

The operational guideline for pH is a range of 7.0 to 10.5 in finished drinking water.

Note 5.3 for Sulphate:

There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L. Health authorities should be notified of drinking water sources containing above 500 mg/L.

Note 5.4 for Aluminum (total):

The operational guidance (OG) value for total aluminum in drinking water is 0.100 mg/L (100 µg/L) to optimize water treatment and distribution system operations. This value is based on a locational running annual average. The sampling frequency required to calculate the locational running annual average will vary based on the type of treatment facility and the sampling location. (Update March 5, 2021)

Note 5.5 for Manganese (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

6. Notes for BC Approved Water Quality Guidelines for livestock (BCAWQG L)**General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports.

Note 6.1 for pH:

Update August 2019 Summary Report.

Note 6.2 for Temperature:

The recommended guideline for temperature is + or - 1 degree Celsius change from natural ambient background.

Note 6.3 for Turbidity:

Induced turbidity should not exceed 5 NTU when background turbidity is less than or equal to 50 NTU, nor should induced turbidity be more than 10 % of background when background is greater than 50 NTU.

Note 6.4 for Chloride:

The water quality guideline for chloride for livestock watering is 600 mg/L.

Note 6.5 for Fluoride:

The total fluoride recommendation for dairy cows, breeding stock and other long-lived animals is 1.0 mg/L as a 30-day mean and 1.5 mg/L as a maximum. Total fluoride should not exceed 2.0 mg/L as a 30-day mean or 4.0 mg/L maximum in the drinking water of all other types of livestock, unless fluoride is provided in the diet by bone meal or mineral additives, in which case 1.0 mg/L as a 30-day mean and 2.0 mg/L maximum is recommended. / The most stringent guideline maximum was used in this report.

Note 6.6 for pH:

Update August 2019 Summary Report.

Note 6.7 for Total suspended solids:

Induced suspended sediments should not exceed 10 mg/L when background suspended sediments is less than or equal to 100 mg/L, nor should induced suspended sediments be more than 10 % of background when background is greater than 100 mg/L.

Note 6.8 for E. coli (MPN):

The guideline for E. coli varies based on site specific factors including type of livestock, whether livestock are closely confined, and type of water treatment.

The guideline for free range animals is "none applicable".

The guideline maximum for general livestock use is 200/100 mL.

The guideline maximum for closely confined, no treatment, is 0/100 mL.

The guideline maximum for closely confined, disinfection only, is less than or equal to 10/100 mL 90th percentile.

The guideline maximum for closely confined, partial treatment, is less than or equal to 100/100 mL 90th percentile.

The guideline for closely confined, complete treatment is "none applicable". / The guideline for general livestock use was used in this report.

Note 6.9 for Fecal coliforms (MPN):

The guideline for Fecal coliforms varies based on site specific factors including type of livestock, whether livestock are closely confined, and type of water treatment.

The guideline for free range animals is "none applicable".

The guideline maximum for general livestock use is 200/100 mL.

The guideline maximum for closely confined, no treatment, is 0/100 mL.

The guideline maximum for closely confined, disinfection only, is less than or equal to 10/100 mL 90th percentile.

The guideline maximum for closely confined, partial treatment, is less than or equal to 100/100 mL 90th percentile.

The guideline for closely confined, complete treatment is "none applicable". / The guideline for general livestock use was used in this report.

Note 6.10 for Nitrate (as N):

Overview Report Update, September 2009.

Note 6.13 for Nitrite (as N):

Overview Report Update, September 2009.

Note 6.14 for Aluminum (total):

The guideline maximum for total aluminum is 5 mg/L. A separate guideline for dissolved aluminum is not provided.

Note 6.15 for Arsenic (total):

The interim guideline for total arsenic is 25 µg/L.

Note 6.16 for Molybdenum (total):

Interim guidelines for total molybdenum are based on differences in sensitivity to molybdenum exposure: 1) ruminant livestock, 0.016 mg/L; and 2) non-ruminant livestock: 0.284 mg/L. The most stringent guideline (0.016 mg/L for ruminant livestock) has been used.

Note 6.17 for Selenium (total):

The guideline for total selenium is 30.0 µg/L mean. The mean concentrations in the water column are based on at least 5 weekly samples taken over a 30-day period.

7. Notes for BC Working Water Quality Guidelines for Livestock (2020) (BCWWQG I)**General Notes:**

Reference: B.C. Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (2021). WWQG values are long-term (i.e. average) concentrations unless identified as a short-term maximum in the "Notes" for a specific analyte. Long-term WWQGs represent average substance concentrations calculated from 5 samples in 30 days. WWQG are given for total substance concentrations unless otherwise noted.

Note 7.1 for Total dissolved solids:

The guideline is 1,000-3,000 mg/L, and is species dependent. Maximum of 1000 mg/L is relatively low level of salinity; excellent for all classes of livestock. TDS between 1000 and 3000 mg/L is satisfactory for all classes of livestock and poultry, but some loss in productivity should be anticipated: may cause temporary and mild diarrhoea in livestock not accustomed to them or watery droppings in poultry. / The most stringent guideline was used in this report.

Note 7.2 for Sulphate:

The guideline is for dissolved sulphate.

Note 7.3 for Cadmium (total):

This is a Short-term maximum guideline.

Note 7.4 for Chromium (total):

The guideline for Cr(VI) is 50 µg/L (total). The guideline for Cr(III) is 50 µg/L (total). The guideline of 50 µg/L for Cr(VI), and for Cr(III) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

8. Notes for BC Approved Water Quality Guidelines for irrigation (BCAWQG I)**General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports.

Note 8.1 for pH:

Update August 2019 Summary Report.

Note 8.2 for Temperature:

The recommended guideline for temperature is + or - 1 degree Celsius change from natural ambient background.

Note 8.3 for Turbidity:

Induced turbidity should not exceed 10 NTU when background turbidity is less than or equal to 50 NTU, nor should induced turbidity be more than 20 % of background when background is greater than 50 NTU.

Note 8.4 for Fluoride:

Total fluoride in irrigation water should not exceed 1.0 mg/L as a 30-day average or a maximum of 2.0 mg/L.

Note 8.5 for pH:

Update August 2019 Summary Report.

Note 8.6 for Total suspended solids:

Induced suspended sediments should not exceed 20 mg/L when background suspended sediments is less than or equal to 100 mg/L, nor should induced suspended sediments be more than 20 % of background when background is greater than 100 mg/L.

Note 8.7 for E. coli (MPN):

The guideline for irrigation for E. coli varies as a function of crop, public access, and livestock access.

The guideline maximum for crops eaten raw is less than or equal to 77/100 mL geometric mean.

The guideline maximum for public access and livestock access is less than or equal to 385/100 mL geometric mean.

The guideline maximum for general irrigation is less than or equal to 1000/100 mL geometric mean. / The guideline for public access and livestock access was used in this report.

Note 8.8 for Fecal coliforms (MPN):

The guideline for irrigation for Fecal coliforms depends on the crop, public access, and livestock access.

The guideline maximum for crops eaten raw is less than or equal to 200/100 mL geometric mean.

The guideline for public access and livestock access is "none applicable".

The guideline maximum for general irrigation is less than or equal to 1000/100 mL geometric mean. / The guideline for general irrigation was used in this report.

Note 8.9 for Aluminum (total):

The guideline maximum for total aluminum is 5 mg/L. A separate guideline for dissolved aluminum is not provided.

Note 8.10 for Arsenic (total):

The interim guideline for total arsenic is 100 µg/L.

Note 8.11 for Boron (total):

The guideline for total boron depends on the crop, and varies from 0.5 mg/L to 6 mg/L. The most stringent guideline maximum of 0.5 mg/L, for very sensitive and sensitive crops, was used to identify exceedances for this report.

Note 8.12 for Copper (total):

The guideline maximum for total copper is 200 µg/L.

Note 8.13 for Lead (total):

For neutral and alkaline fine-textured soils the total lead concentration in irrigation water should not exceed 400 µg/L at any time. The concentration of total lead in irrigation water for use on all other soils should not exceed 200 µg/L at any time. / The most stringent guideline maximum was used in this report.

Note 8.14 for Molybdenum (total):

The long-term chronic guidelines for total molybdenum are as follows:

Forage crops-poorly drained soil: 0.01 mg/L

Forage crops-well drained soil: 0.02 mg/L

Non-forage crops: 0.028 mg/L. This guideline is intended to be protective of terrestrial plants and is not necessarily protective of livestock consuming these plants.

The most stringent guideline (0.01 mg/L for irrigation of forage crops-poorly drained soil) has been used.

Note 8.15 for Selenium (total):

The guideline for total selenium is 10 µg/L mean. The mean concentrations in the water column are based on at least 5 weekly samples taken over a 30-day period.

Note 8.16 for Zinc (total):

The guideline maximum for total zinc for irrigation is as follows:

- Soil pH less than 6: 1000 µg/L.

- Soil pH equal to or greater than 6, and less than 7: 2000 µg/L.

- Soil pH greater than or equal to 7: 5000 µg/L. / The most stringent guideline maximum was used in this report.

9. Notes for BC Working Water Quality Guidelines for Irrigation (2020) (BCWWQG I)**General Notes:**

Reference: B.C. Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (2021). WWQG values are long-term (i.e. average) concentrations unless identified as a short-term maximum in the "Notes" for a specific analyte. Long-term WWQGs represent average substance concentrations calculated from 5 samples in 30 days. WWQG are given for total substance concentrations unless otherwise noted.

Note 9.1 for Conductivity:

The guideline varies from 700 to 5000 µS/cm depending on the type of crop. The most stringent guideline has been used for this report.

Note 9.2 for Total dissolved solids:

The guideline varies from 500 to 3500 mg/L depending on the type of crop. The most stringent guideline has been used for this report.

Note 9.3 for Conductivity:

The guideline varies from 700 to 5000 µS/cm depending on the type of crop. The most stringent guideline has been used for this report.

Note 9.4 for Cadmium (total):

This is a Short-term maximum guideline.

Note 9.5 for Chromium (total):

The guideline for Cr(VI) is 8 µg/L (total).

The guideline for Cr(III) is 4.9 µg/L (total).

The guideline of 4.9 µg/L for Cr(III) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 9.6 for Cobalt (total):

Continuous or intermittent use on all soils.

Note 9.7 for Lithium (total):

The guideline is 2.5 mg/L for non-citrus crops (May not be protective of barley and other cereal crops; 1.0 mg/L suggested for cereal crops). The guideline is 0.75 mg/L for citrus crops. / The most stringent guideline was used in this report.

10. Notes for BC Source Drinking Water Quality Guidelines - Maximum Acceptable Concentrations (2020 and updates) (BC SDWQG MAC)**General Notes:**

The source drinking water quality guidelines apply to the ambient water before it is treated and distributed for domestic use. The guidelines apply to drinking water sources from surface water and groundwater.

Note 10.1 for Turbidity:

For raw drinking water without treatment for particulates the guideline is: ≤ 1 NTU of turbidity.

For raw drinking water with treatment for particulates the guideline is:

Natural background turbidity is ≤ 50 NTU: Change from background should not exceed 5 NTU.

Natural background turbidity is > 50 NTU: Change from background should not exceed 10% of the background turbidity.

Note 10.2 for E. coli (MPN):

The MAC is ≤ 10 E. coli /100 mL; 90th percentile (minimum of 5 samples).

Note 10.3 for Fecal coliforms (MPN):

The MAC is ≤ 10 coliforms/100 mL; 90th percentile (minimum of 5 samples).

Note 10.4 for Copper (total):

Includes short-term and long-term exposure.

11. Notes for BC Source Drinking Water Quality Guidelines - Aesthetic Objectives (2020 and updates) (BC SDWQG AO)**General Notes:**

The source drinking water quality guidelines apply to the ambient water before it is treated and distributed for domestic use. The guidelines apply to drinking water sources from surface water and groundwater.

Note 11.1 for Phosphorus (total, by ICPMS/ICPOES):

The AO for lakes is 0.01 mg/L. For lakes with residence time > 6 months, measure total P during spring overturn. For lakes with residence time < 6 months, measure mean epilimnetic total P during the growing season (ENV 1985).

Note 11.2 for Phosphorus (total, APHA 4500-P):

The AO for lakes is 0.01 mg/L. For lakes with residence time > 6 months, measure total P during spring overturn. For lakes with residence time < 6 months, measure mean epilimnetic total P during the growing season (ENV 1985).

Note 11.3 for Phosphorus (dissolved, APHA 4500-P):

The AO for lakes is 0.01 mg/L. For lakes with residence time > 6 months, measure total P during spring overturn. For lakes with residence time < 6 months, measure mean epilimnetic total P during the growing season (ENV 1985).

12. Notes for BC CSR Generic Numerical Water Standards for Freshwater Aquatic Life (CSR AW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Aquatic life standards assume minimum 1:10 dilution available.

Standards for all organic substances are for total substance concentrations. Any water sample to be analyzed for organic substances should not be filtered.

Standards for surface water samples to be analyzed for heavy metals, metalloids and inorganic ions are total substance concentrations. In addition, it is recommended that surface water samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for dissolved substance concentrations.

Standards for groundwater samples for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations. In addition, it is recommended that groundwater samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for total substance concentrations. / The standard to protect freshwater aquatic life was used when separate aquatic life standards are provided for freshwater aquatic life and marine aquatic life.

Note 12.1 for Fluoride:

The standard for fluoride is:

2000 µg/L @ H < 50

3000 µg/L @ H ≥ 50

Where H means water hardness in mg/L as CaCO₃.

Note 12.2 for Sulphate:

The standard for sulfate is:

1280 mg/L @ H ≤ 30

2180 mg/L @ H 31 - 75

3090 mg/L @ H 76 - 180

4290 mg/L @ H > 180

Where H means water hardness in mg/L as CaCO₃.

Note 12.3 for Ammonia (total, as N):

Standard varies with pH and temperature. 10 degrees C is assumed. Consult a director for further advice.

The standard for ammonia, total (as N) is:

1,310 µg/L @ pH ≥ to 8.5

3,700 µg/L @ pH 8.0 - < 8.5

11,300 µg/L @ pH 7.5 - < 8.0

18,500 µg/L @ pH 7.0 - < 7.5

18,400 µg/L @ pH < 7.0

Note 12.4 for Nitrate (as N):

Standard may not protect all amphibians. Consult director for further advice.

Note 12.5 for Nitrate + Nitrite (as N):

Standard may not protect all amphibians. Consult director for further advice.

Note 12.6 for Nitrate + Nitrite (as N) (calculated):

Standard may not protect all amphibians. Consult director for further advice.

Note 12.7 for Nitrite (as N):

Standard varies with chloride concentration. Consult a director for further advice.

The standard for nitrite (as N) is:

200 µg/L (Cl < 2 mg/L)

400 µg/L (Cl 2 - < 4 mg/L)

600 µg/L (Cl 4 - < 6 mg/L)

800 µg/L (Cl 6 - < 8 mg/L)

1,000 µg/L (Cl 8 - < 10 mg/L)

2,000 µg/L (Cl ≥ 10 mg/L)

Note 12.8 for Cadmium (total):

The standard for cadmium is as follows:

0.5 µg/L @ H < 30

1.5 µg/L @ H 30 - < 90

2.5 µg/L @ H 90 - < 150

3.5 µg/L @ H 150 - < 210

4 µg/L @ H ≥ 210

Where H means water hardness in mg/L as CaCO₃.

Note 12.9 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 10 µg/L for chromium, hexavalent. Standard is 90 µg/L for chromium, trivalent. The standard of 10 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

Note 12.10 for Copper (total):

The standard for copper is as follows:

20 µg/L @ H < 50

30 µg/L @ H 50 - < 75

40 µg/L @ H 75 - < 100

50 µg/L @ H 100 - < 125

60 µg/L @ H 125 - < 150

70 µg/L @ H 150 - < 175

80 µg/L @ H 175 - < 200

90 µg/L @ H ≥ 200

Where H means water hardness in mg/L as CaCO₃.

Note 12.11 for Lead (total):

The standard for lead is as follows:

40 µg/L @ H < 50

50 µg/L @ H 50 - < 100

60 µg/L @ H 100 - < 200

110 µg/L @ H 200 - < 300

160 µg/L @ ≥ 300

Where H means water hardness in mg/L as CaCO₃.

Note 12.12 for Nickel (total):

The standard for nickel is as follows:

250 µg/L @ H < 60

650 µg/L @ H 60 - < 120

1,100 µg/L @ H 120 - < 180

1,500 µg/L @ H ≥ 180

Where H means water hardness in mg/L as CaCO₃.

Note 12.13 for Silver (total):

The standard for silver is:

0.5 µg/L @ H ≤ 100

15 µg/L @ H > 100

Where H means water hardness in mg/L as CaCO₃.

Note 12.14 for Zinc (total):

The standard for zinc is as follows:

75 µg/L @ H < 90

150 µg/L @ H = 90 - < 100

900 µg/L @ H = 100 - < 200

1,650 µg/L @ H = 200 - < 300

2,400 µg/L @ H = 300 - < 400

3,150 µg/L @ H = 400 - < 500

If H ≥ 500 then use following formula:

Standard (µg/L) = 10 x [7.5 + {(0.75)(H - 90)}]

Where H means water hardness in mg/L as CaCO₃.

There are special ministry approval and data reporting requirements for water hardness values ≥ 500 mg/L as CaCO₃.

Reference is Schedule 3.2 and Protocol 10.

13. Notes for BC CSR Generic Numerical Water Standards for Irrigation (CSR IW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Standards for all organic substances are for total substance concentrations. Any water sample to be analyzed for organic substances should not be filtered.

Standards for surface water samples to be analyzed for heavy metals, metalloids and inorganic ions are total substance concentrations. In addition, it is recommended that surface water samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for dissolved substance concentrations.

Standards for groundwater samples for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations. In addition, it is recommended that groundwater samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for total substance concentrations.

Standards apply to irrigation of all soil types, unless otherwise indicated. / There are several different standards for site-specific factors for some analytes. The most stringent standards were used for this criteria set.

Note 13.1 for Chloride:

Standard to protect all types of crops.

Note 13.2 for Boron (total):

Standard varies depending on crop. This standard is for blackberry crop.

Note 13.3 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 8 µg/L for chromium, hexavalent. Standard is 5 µg/L for chromium, trivalent. The standard of 5 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

Note 13.4 for Iron (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

(a) item A6, A7, A8 or A11

(b) item C1, C2, C3, C4 or C6,

(c) item D2, D3, D5, or D6

(d) item E4, or

(e) item H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above.

Note 13.5 for Lithium (total):

Standard to protect all types of crops.

Note 13.6 for Manganese (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

(a) item B1

(b) item C1, C3 or C4

(c) item D2, D3, D5, or D6

(d) item E4, or

(e) item H3 or H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above.

Note 13.7 for Molybdenum (total):

Standard varies with crop, soil drainage and Mo:Cu ratio. Standard is 10 – 30 µg/L. Consult a director for further advice.

The most stringent standard of 10 µg/L has been used.

Note 13.8 for Selenium (total):

Standard varies with type of application; continuous or intermittent. This standard is for continuous applications on crops.

Note 13.9 for Zinc (total):

The standard varies (from 1000 to 5000 µg/L) with soil pH. This standard (which is the most stringent) is for soil pH less than 6.0

14. Notes for BC CSR Generic Numerical Water Standards for Livestock (CSR LW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Standards for all organic substances are for total substance concentrations. Any water sample to be analyzed for organic substances should not be filtered.

Standards for surface water samples to be analyzed for heavy metals, metalloids and inorganic ions are total substance concentrations. In addition, it is recommended that surface water samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for dissolved substance concentrations.

Standards for groundwater samples for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations. In addition, it is recommended that groundwater samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for total substance concentrations.

Note 14.1 for Fluoride:

Standard varies with type of livestock. Consult a director for further advice.

Note 14.2 for Nitrate (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 14.3 for Nitrate + Nitrite (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 14.4 for Nitrate + Nitrite (as N) (calculated):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 14.5 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 50 µg/L for chromium, hexavalent. Standard is 50 µg/L for chromium, trivalent. The standard of 50 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

15. Notes for BC CSR Generic Numerical Water Standards for Drinking Water (CSR DW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Drinking water standards are for unfiltered samples obtained at the point of consumption. Heavy metals, metalloids and inorganic ions are expressed as total substance concentrations unless otherwise indicated.

Note 15.1 for Chloride:

Standard to protect against taste and odour concerns.

Note 15.2 for Sulphate:

Standard to protect against taste and odour concerns.

Note 15.3 for Nitrate (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 15.4 for Nitrate + Nitrite (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 15.5 for Nitrate + Nitrite (as N) (calculated):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 15.6 for Aluminum (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 15.7 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 50 µg/L for chromium, hexavalent. Standard is 6000 µg/L for chromium, trivalent. The standard of 50 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

Note 15.8 for Copper (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 15.9 for Iron (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

- (a) item A6, A7, A8 or A11
- (b) item C1, C2, C3, C4 or C6,
- (c) item D2, D3, D5, or D6
- (d) item E4, or
- (e) item H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above.

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 15.10 for Manganese (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

- (a) item B1
- (b) item C1, C3 or C4
- (c) item D2, D3, D5, or D6
- (d) item E4, or
- (e) item H3 or H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above.

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 15.11 for Sodium (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Note 15.12 for Zinc (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Exceedences by Guideline

Sampling Location	Guideline	Exceedences
Okanagan River Channel 100m Upstream	BCAWQG AL (LT)	Dissolved oxygen [F]
	BCWWQG AL	Chromium (total)
	BCAWQG AL (ST)	Temperature [F]
	GCDWQ MAC	E. coli (MPN), Fecal coliforms (MPN)
	GCDWQ AO	Aluminum (total), Manganese (total), Temperature [F]
	BCWWQG I	Chromium (total)
	BC SDWQG MAC	E. coli (MPN), Fecal coliforms (MPN)
	BC SDWQG AO	Manganese (total), Temperature [F]
	CSR IW	Chromium (total)
Okanagan River Channel 100m Downstream	BCAWQG AL (LT)	Dissolved oxygen [F]
	BCWWQG AL	Chromium (total)
	BCAWQG AL (ST)	Temperature [F]
	GCDWQ MAC	E. coli (MPN), Fecal coliforms (MPN)
	GCDWQ AO	Aluminum (total), Iron (total), Manganese (total), Temperature [F]
	BC SDWQG MAC	E. coli (MPN), Fecal coliforms (MPN)
	BC SDWQG AO	Iron (total), Manganese (total), Temperature [F]
Okanagan River Channel 500m Downstream	BCAWQG AL (LT)	Dissolved oxygen [F]
	BCWWQG AL	Chromium (total)
	BCAWQG AL (ST)	Temperature [F]
	GCDWQ MAC	E. coli (MPN), Fecal coliforms (MPN)
	GCDWQ AO	Aluminum (total), Iron (total), Manganese (total), Temperature [F]
	BCWWQG I	Chromium (total)
	BC SDWQG MAC	E. coli (MPN), Fecal coliforms (MPN)
	BC SDWQG AO	Iron (total), Manganese (total), Temperature [F]
	CSR IW	Chromium (total)

[F] = Field Result(s)

Exceedences by Analyte

	Okanagan River Channel 100m Upstream	Okanagan River Channel 100m Downstream	Okanagan River Channel 500m Downstream
Field Results			
Dissolved oxygen	X	X	X
Temperature	X	X	X
Lab Results			
Microbiological			
E. coli (MPN)	X	X	X
Fecal coliforms (MPN)	X	X	X
Total Metals			
Aluminum (total)	X	X	X
Chromium (total)	X	X	X
Iron (total)		X	X
Manganese (total)	X	X	X

Legend for Reports for RDOS Landfill and Wastewater Treatment Sites Water Quality Results

<	Less than reported detection limit
>	Greater than reported upper detection limit
>=	Greater than or equal to
A	Absent
BC SDWQG AO	BC Source Drinking Water Quality Guidelines - Aesthetic Objectives (2020 and updates)
BC SDWQG MAC	BC Source Drinking Water Quality Guidelines - Maximum Acceptable Concentrations (2020 and updates)
BCAWQG AL (LT)	BC Approved Water Quality Guidelines for freshwater aquatic life (Long-term chronic)
BCAWQG AL (ST)	BC Approved Water Quality Guidelines for freshwater aquatic life (Short-term acute)
BCAWQG I	BC Approved Water Quality Guidelines for irrigation
BCAWQG L	BC Approved Water Quality Guidelines for livestock
BCWWQG AL	BC Working Water Quality Guidelines for Freshwater Aquatic Life (2020)
BCWWQG I	BC Working Water Quality Guidelines for Irrigation (2020)
BCWWQG L	BC Working Water Quality Guidelines for Livestock (2020)
Calc	Calculated guideline or standard. The guideline or standard is dependent on the value of one or more other analytes, and is calculated from a formula or table.
CSR AW	BC CSR Generic Numerical Water Standards for Freshwater Aquatic Life
CSR DW	BC CSR Generic Numerical Water Standards for Drinking Water
CSR IW	BC CSR Generic Numerical Water Standards for Irrigation
CSR LW	BC CSR Generic Numerical Water Standards for Livestock
GCDWQ AO	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives
GCDWQ MAC	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations
L	Laboratory reading type (Lab result)
m asl	metres above sea level
N	Narrative type of guideline or standard, or Result Note.
ND	Non-detect. Result is less than lower detection limit.
NG	No Guideline
NR	No Result
NS	No Standard
NT	Not Tested
OG	Overgrown
P	Present
PR	Presumptive
TK	Test kit reading type (Field result)
TNTC	Too numerous to count
	Highlighted value has a lower detection limit that is greater than the guideline/standard maximum and/or the guideline/standard minimum, or has an upper detection limit that is less than the guideline/standard maximum and/or the guideline/standard minimum.
	The maximum guideline/standard value cannot be determined because a result for a dependent analyte is not available for the sample.
<u>BC SDWQG AO</u>	Highlighted value exceeds BC SDWQG AO
<u>BC SDWQG MAC</u>	Highlighted value exceeds BC SDWQG MAC
<u>BCAWQG AL (LT)</u>	Highlighted value exceeds BCAWQG AL (LT)
<u>BCAWQG AL (ST)</u>	Highlighted value exceeds BCAWQG AL (ST)
<u>BCAWQG I</u>	Highlighted value exceeds BCAWQG I
<u>BCAWQG L</u>	Highlighted value exceeds BCAWQG L
<u>BCWWQG AL</u>	Highlighted value exceeds BCWWQG AL
<u>BCWWQG I</u>	Highlighted value exceeds BCWWQG I
<u>BCWWQG L</u>	Highlighted value exceeds BCWWQG L
<u>CSR AW</u>	Highlighted value exceeds CSR AW
<u>CSR DW</u>	Highlighted value exceeds CSR DW
<u>CSR IW</u>	Highlighted value exceeds CSR IW
<u>CSR LW</u>	Highlighted value exceeds CSR LW
<u>GCDWQ AO</u>	Highlighted value exceeds GCDWQ AO
<u>GCDWQ MAC</u>	Highlighted value exceeds GCDWQ MAC
<u>SL Criteria Override</u>	Highlighted value exceeds sampling location criteria override

APPENDIX R

Okanagan River Channel Water Quality Monitoring 2021 Lab Reports



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21A1871
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-01-21 09:00 / 5°C 2021-01-28 13:10
PO NUMBER	OK Falls WW	COC NUMBER	B096330
PROJECT	OK Falls WWTP QORC		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

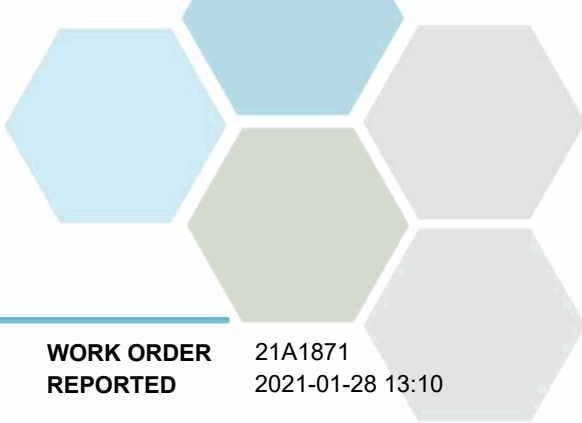
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21A1871
2021-01-28 13:10

Analyte	Result	RL	Units	Analyzed	Qualifier
OK River 100m U/S (21A1871-01) Matrix: Water Sampled: 2021-01-20 13:25					FILT, PRES

Anions

Chloride	6.20	0.10	mg/L	2021-01-24	
Fluoride	0.15	0.10	mg/L	2021-01-24	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-01-24	HT1
Nitrite (as N)	< 0.010	0.010	mg/L	2021-01-24	HT1
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-01-24	HT1
Sulfate	29.3	1.0	mg/L	2021-01-24	

Calculated Parameters

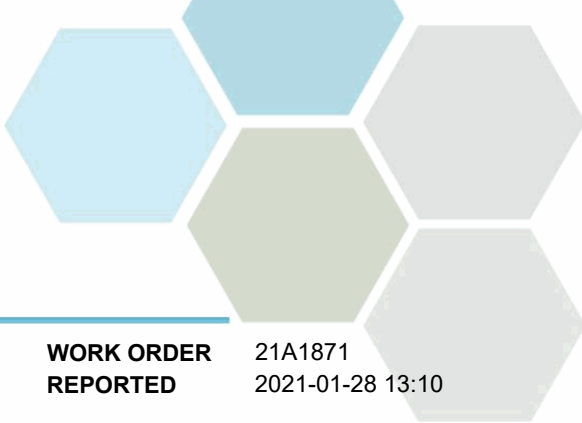
Hardness, Total (as CaCO3)	122	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.250	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	135	1.0	mg/L	2021-01-24	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Alkalinity, Bicarbonate (as CaCO3)	135	1.0	mg/L	2021-01-24	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-01-22	
BOD, 5-day	< 1.2	2.0	mg/L	2021-01-27	
Chemical Oxygen Demand	17	20	mg/L	2021-01-25	
Conductivity (EC)	282	2.0	µS/cm	2021-01-24	
Nitrogen, Total Kjeldahl	0.250	0.050	mg/L	2021-01-25	
pH	8.07	0.10	pH units	2021-01-24	HT2
Phosphorus, Total (as P)	0.0151	0.0050	mg/L	2021-01-25	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-01-25	
Solids, Total Suspended	4.2	2.0	mg/L	2021-01-25	

Total Metals

Aluminum, total	< 0.0050	0.0050	mg/L	2021-01-23	
Antimony, total	< 0.00020	0.00020	mg/L	2021-01-23	
Arsenic, total	0.00061	0.00050	mg/L	2021-01-23	
Barium, total	0.0229	0.0050	mg/L	2021-01-23	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-01-23	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-01-23	
Boron, total	< 0.0500	0.0500	mg/L	2021-01-23	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-01-23	
Calcium, total	31.3	0.20	mg/L	2021-01-23	
Chromium, total	0.00680	0.00050	mg/L	2021-01-23	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-01-23	
Copper, total	0.00068	0.00040	mg/L	2021-01-23	
Iron, total	< 0.010	0.010	mg/L	2021-01-23	
Lead, total	< 0.00020	0.00020	mg/L	2021-01-23	
Lithium, total	0.00352	0.00010	mg/L	2021-01-23	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21A1871
2021-01-28 13:10

Analyte	Result	RL	Units	Analyzed	Qualifier
OK River 100m U/S (21A1871-01) Matrix: Water Sampled: 2021-01-20 13:25, Continued					FILT, PRES

Total Metals, Continued

Magnesium, total	10.5	0.010	mg/L	2021-01-23	
Manganese, total	0.0211	0.00020	mg/L	2021-01-23	
Mercury, total	< 0.000010	0.000010	mg/L	2021-01-22	
Molybdenum, total	0.00326	0.00010	mg/L	2021-01-23	
Nickel, total	< 0.00040	0.00040	mg/L	2021-01-23	
Phosphorus, total	< 0.050	0.050	mg/L	2021-01-23	
Potassium, total	2.81	0.10	mg/L	2021-01-23	
Selenium, total	< 0.00050	0.00050	mg/L	2021-01-23	
Silicon, total	3.3	1.0	mg/L	2021-01-23	
Silver, total	< 0.000050	0.000050	mg/L	2021-01-23	
Sodium, total	11.6	0.10	mg/L	2021-01-23	
Strontium, total	0.300	0.0010	mg/L	2021-01-23	
Sulfur, total	10.8	3.0	mg/L	2021-01-23	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-01-23	
Thallium, total	< 0.000020	0.000020	mg/L	2021-01-23	
Thorium, total	< 0.00010	0.00010	mg/L	2021-01-23	
Tin, total	< 0.00020	0.00020	mg/L	2021-01-23	
Titanium, total	< 0.0050	0.0050	mg/L	2021-01-23	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-01-23	
Uranium, total	0.00233	0.000020	mg/L	2021-01-23	
Vanadium, total	0.0015	0.0010	mg/L	2021-01-23	
Zinc, total	< 0.0040	0.0040	mg/L	2021-01-23	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-01-23	

OK River 100m D/S (21A1871-02) | Matrix: Water | Sampled: 2021-01-20 13:45

FILT, PRES

Anions

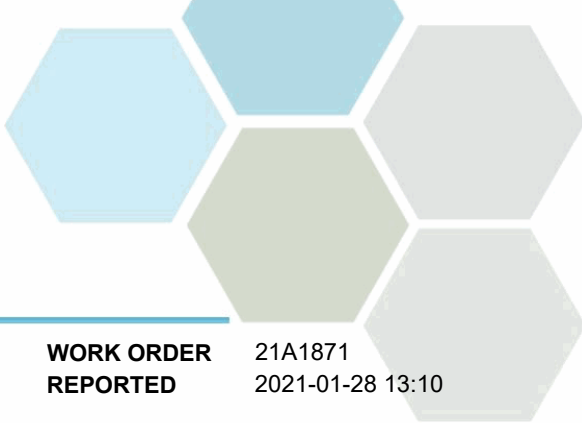
Chloride	6.36	0.10	mg/L	2021-01-24	
Fluoride	0.16	0.10	mg/L	2021-01-24	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-01-24	HT1
Nitrite (as N)	< 0.010	0.010	mg/L	2021-01-24	HT1
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-01-24	HT1
Sulfate	29.6	1.0	mg/L	2021-01-24	

Calculated Parameters

Hardness, Total (as CaCO3)	129	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.265	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	142	1.0	mg/L	2021-01-24	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21A1871
2021-01-28 13:10

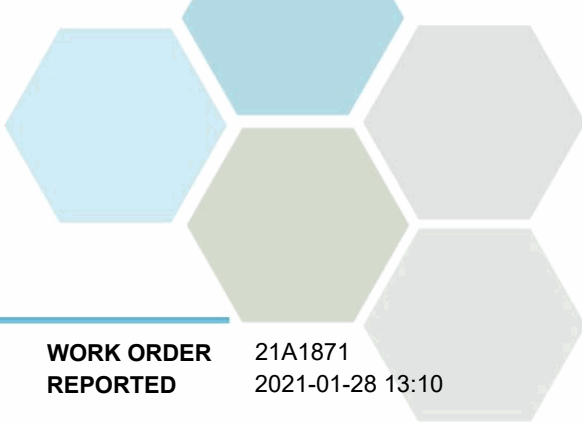
Analyte	Result	RL	Units	Analyzed	Qualifier
OK River 100m D/S (21A1871-02) Matrix: Water Sampled: 2021-01-20 13:45, Continued					FILT, PRES

General Parameters, Continued

Alkalinity, Bicarbonate (as CaCO3)	142	1.0	mg/L	2021-01-24	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-01-22	
BOD, 5-day	1.5	2.0	mg/L	2021-01-27	
Chemical Oxygen Demand	14	20	mg/L	2021-01-25	
Conductivity (EC)	275	2.0	µS/cm	2021-01-24	
Nitrogen, Total Kjeldahl	0.265	0.050	mg/L	2021-01-25	
pH	8.08	0.10	pH units	2021-01-24	HT2
Phosphorus, Total (as P)	0.0150	0.0050	mg/L	2021-01-25	
Phosphorus, Total Dissolved	0.0071	0.0050	mg/L	2021-01-25	
Solids, Total Suspended	4.2	2.0	mg/L	2021-01-25	

Total Metals

Aluminum, total	0.0061	0.0050	mg/L	2021-01-23	
Antimony, total	< 0.00020	0.00020	mg/L	2021-01-23	
Arsenic, total	0.00059	0.00050	mg/L	2021-01-23	
Barium, total	0.0238	0.0050	mg/L	2021-01-23	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-01-23	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-01-23	
Boron, total	< 0.0500	0.0500	mg/L	2021-01-23	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-01-23	
Calcium, total	33.2	0.20	mg/L	2021-01-23	
Chromium, total	0.00385	0.00050	mg/L	2021-01-23	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-01-23	
Copper, total	0.00069	0.00040	mg/L	2021-01-23	
Iron, total	0.014	0.010	mg/L	2021-01-23	
Lead, total	< 0.00020	0.00020	mg/L	2021-01-23	
Lithium, total	0.00373	0.00010	mg/L	2021-01-23	
Magnesium, total	11.1	0.010	mg/L	2021-01-23	
Manganese, total	0.0168	0.00020	mg/L	2021-01-23	
Mercury, total	< 0.000010	0.000010	mg/L	2021-01-22	
Molybdenum, total	0.00346	0.00010	mg/L	2021-01-23	
Nickel, total	< 0.00040	0.00040	mg/L	2021-01-23	
Phosphorus, total	< 0.050	0.050	mg/L	2021-01-23	
Potassium, total	2.94	0.10	mg/L	2021-01-23	
Selenium, total	< 0.00050	0.00050	mg/L	2021-01-23	
Silicon, total	3.4	1.0	mg/L	2021-01-23	
Silver, total	< 0.000050	0.000050	mg/L	2021-01-23	
Sodium, total	12.1	0.10	mg/L	2021-01-23	
Strontium, total	0.312	0.0010	mg/L	2021-01-23	
Sulfur, total	11.5	3.0	mg/L	2021-01-23	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-01-23	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21A1871
2021-01-28 13:10

Analyte	Result	RL	Units	Analyzed	Qualifier
OK River 100m D/S (21A1871-02) Matrix: Water Sampled: 2021-01-20 13:45, Continued					FILT, PRES

Total Metals, Continued

Thallium, total	< 0.000020	0.000020	mg/L	2021-01-23	
Thorium, total	< 0.00010	0.00010	mg/L	2021-01-23	
Tin, total	0.00022	0.00020	mg/L	2021-01-23	
Titanium, total	< 0.0050	0.0050	mg/L	2021-01-23	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-01-23	
Uranium, total	0.00248	0.000020	mg/L	2021-01-23	
Vanadium, total	0.0016	0.0010	mg/L	2021-01-23	
Zinc, total	0.0313	0.0040	mg/L	2021-01-23	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-01-23	

OK River 500m D/S (21A1871-03) | Matrix: Water | Sampled: 2021-01-20 14:00

FILT, PRES

Anions

Chloride	6.14	0.10	mg/L	2021-01-24	
Fluoride	0.15	0.10	mg/L	2021-01-24	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-01-24	HT1
Nitrite (as N)	< 0.010	0.010	mg/L	2021-01-24	HT1
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-01-24	HT1
Sulfate	29.3	1.0	mg/L	2021-01-24	

Calculated Parameters

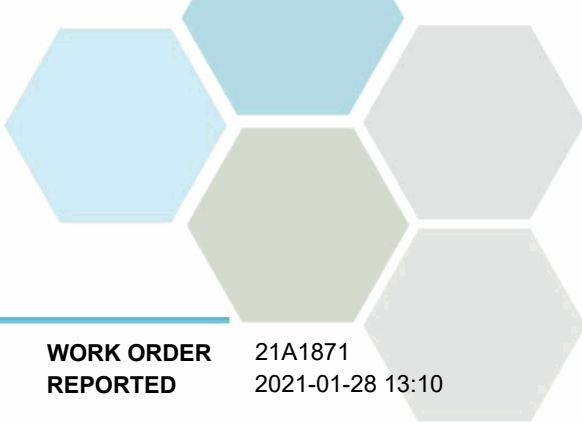
Hardness, Total (as CaCO3)	129	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.239	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	129	1.0	mg/L	2021-01-24	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Alkalinity, Bicarbonate (as CaCO3)	129	1.0	mg/L	2021-01-24	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-01-24	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-01-22	
BOD, 5-day	< 1.2	2.0	mg/L	2021-01-27	
Chemical Oxygen Demand	14	20	mg/L	2021-01-25	
Conductivity (EC)	271	2.0	µS/cm	2021-01-24	
Nitrogen, Total Kjeldahl	0.239	0.050	mg/L	2021-01-25	
pH	8.10	0.10	pH units	2021-01-24	HT2
Phosphorus, Total (as P)	0.0145	0.0050	mg/L	2021-01-25	
Phosphorus, Total Dissolved	0.0058	0.0050	mg/L	2021-01-25	
Solids, Total Suspended	3.6	2.0	mg/L	2021-01-25	

Total Metals

Aluminum, total	0.0057	0.0050	mg/L	2021-01-23	
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TEST RESULTS

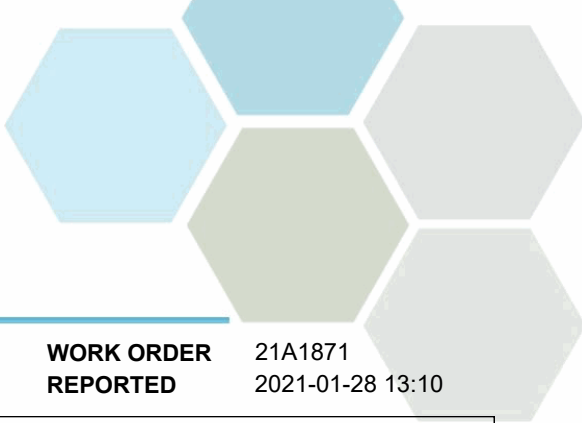
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21A1871
2021-01-28 13:10

Analyte	Result	RL	Units	Analyzed	Qualifier
OK River 500m D/S (21A1871-03) Matrix: Water Sampled: 2021-01-20 14:00, Continued					FILT, PRES

Total Metals, Continued

Antimony, total	< 0.00020	0.00020	mg/L	2021-01-23	
Arsenic, total	0.00065	0.00050	mg/L	2021-01-23	
Barium, total	0.0244	0.0050	mg/L	2021-01-23	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-01-23	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-01-23	
Boron, total	< 0.0500	0.0500	mg/L	2021-01-23	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-01-23	
Calcium, total	33.1	0.20	mg/L	2021-01-23	
Chromium, total	0.00513	0.00050	mg/L	2021-01-23	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-01-23	
Copper, total	0.00060	0.00040	mg/L	2021-01-23	
Iron, total	< 0.010	0.010	mg/L	2021-01-23	
Lead, total	< 0.00020	0.00020	mg/L	2021-01-23	
Lithium, total	0.00369	0.00010	mg/L	2021-01-23	
Magnesium, total	11.2	0.010	mg/L	2021-01-23	
Manganese, total	0.0176	0.00020	mg/L	2021-01-23	
Mercury, total	< 0.000010	0.000010	mg/L	2021-01-22	
Molybdenum, total	0.00341	0.00010	mg/L	2021-01-23	
Nickel, total	< 0.00040	0.00040	mg/L	2021-01-23	
Phosphorus, total	< 0.050	0.050	mg/L	2021-01-23	
Potassium, total	2.99	0.10	mg/L	2021-01-23	
Selenium, total	< 0.00050	0.00050	mg/L	2021-01-23	
Silicon, total	3.5	1.0	mg/L	2021-01-23	
Silver, total	< 0.000050	0.000050	mg/L	2021-01-23	
Sodium, total	12.2	0.10	mg/L	2021-01-23	
Strontium, total	0.316	0.0010	mg/L	2021-01-23	
Sulfur, total	11.7	3.0	mg/L	2021-01-23	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-01-23	
Thallium, total	< 0.000020	0.000020	mg/L	2021-01-23	
Thorium, total	< 0.00010	0.00010	mg/L	2021-01-23	
Tin, total	< 0.00020	0.00020	mg/L	2021-01-23	
Titanium, total	< 0.0050	0.0050	mg/L	2021-01-23	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-01-23	
Uranium, total	0.00241	0.000020	mg/L	2021-01-23	
Vanadium, total	0.0019	0.0010	mg/L	2021-01-23	
Zinc, total	< 0.0040	0.0040	mg/L	2021-01-23	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-01-23	



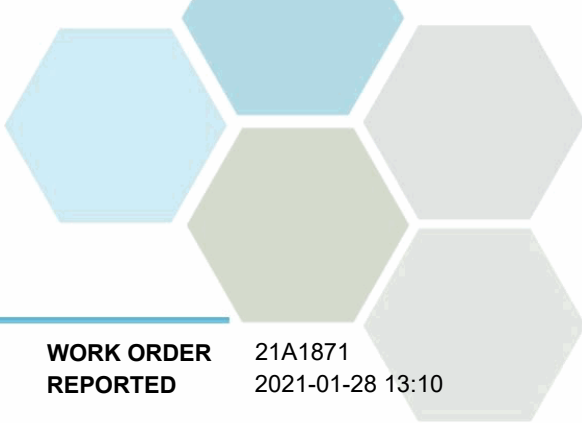
TEST RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls WWTP QORC

WORK ORDER 21A1871
REPORTED 2021-01-28 13:10

Sample Qualifiers:

- FILT The sample has been filtered for DP in the laboratory. Results may not reflect conditions at the time of sampling.
- 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.
- PRES Sample has been preserved for DP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

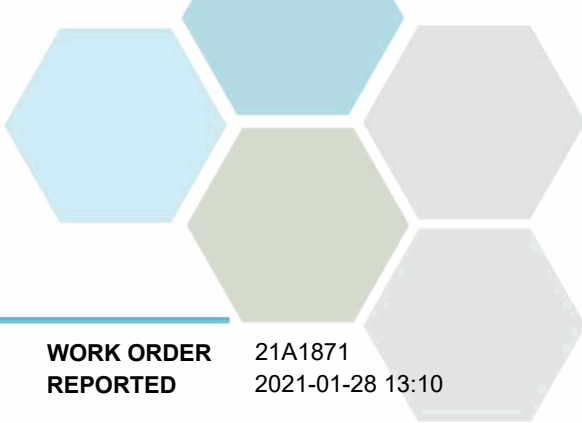
WORK ORDER REPORTED 21A1871
2021-01-28 13:10

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21A1871
2021-01-28 13:10

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. The quality control (QC) data is available upon request

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.

CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QORC

PROJECT INFO

WORK ORDER 21A1875

RECEIVED / TEMP 2021-01-21 09:00 / 5°C

REPORTED 2021-01-25 12:20

COC NUMBER B096330

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.

Work Order Comments:

Custody Seals Intact: YES

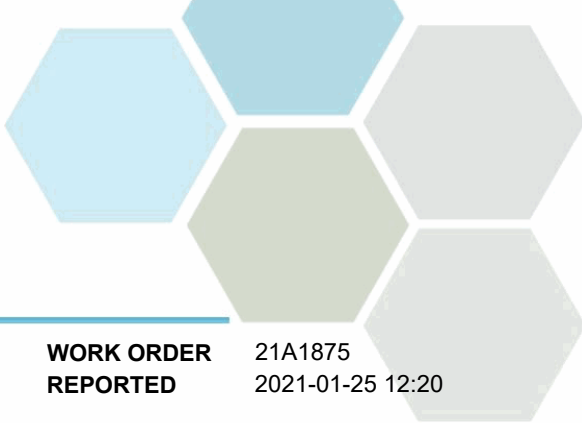
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

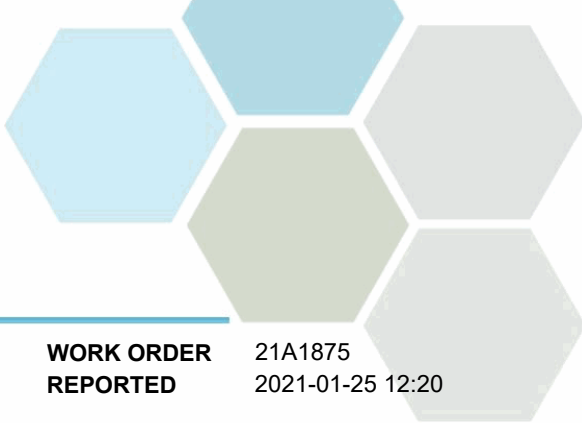


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21A1875
2021-01-25 12:20

Analyte	Result	RL	Units	Analyzed	Qualifier
OK River 100m U/S (21A1875-01) Matrix: Water Sampled: 2021-01-20 13:25					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-01-21	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-01-21	
OK River 100m D/S (21A1875-02) Matrix: Water Sampled: 2021-01-20 13:45					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	2	1	MPN/100 mL	2021-01-21	
E. coli (Q-Tray)	2	1	MPN/100 mL	2021-01-21	
OK River 500m D/S (21A1875-03) Matrix: Water Sampled: 2021-01-20 14:00					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-01-21	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-01-21	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21A1875
2021-01-25 12:20

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21B1889

RECEIVED / TEMP 2021-02-18 12:00 / 2°C

REPORTED 2021-02-19 13:43

COC NUMBER B104521

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

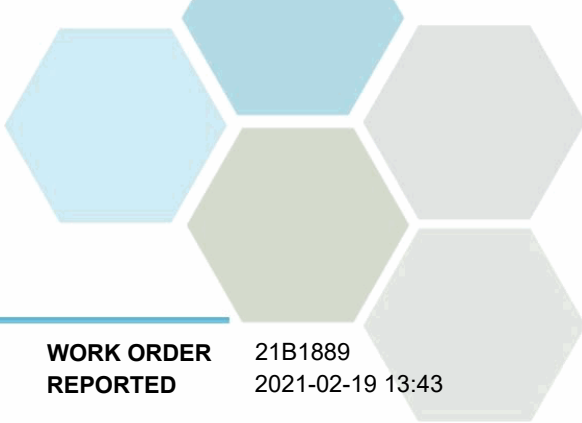
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21B1889
2021-02-19 13:43

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21B1889-01) | Matrix: Water | Sampled: 2021-02-17 11:10

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	1	1	MPN/100 mL	2021-02-18	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-02-18	

Okanagan River Channel 100m Downstream - Bacteria (21B1889-02) | Matrix: Water | Sampled: 2021-02-17 11:30

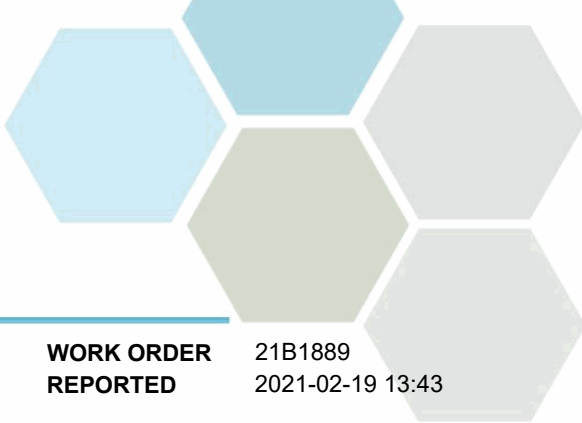
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-02-18	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-02-18	

Okanagan River Channel 500m Downstream - Bacteria (21B1889-03) | Matrix: Water | Sampled: 2021-02-17 11:45

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	2	1	MPN/100 mL	2021-02-18	
E. coli (Q-Tray)	2	1	MPN/100 mL	2021-02-18	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21B1889
2021-02-19 13:43

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21B1890

RECEIVED / TEMP 2021-02-18 12:00 / 2°C

REPORTED 2021-02-23 14:51

COC NUMBER B104521

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Work Order Comments:

Custody Seals Intact: YES

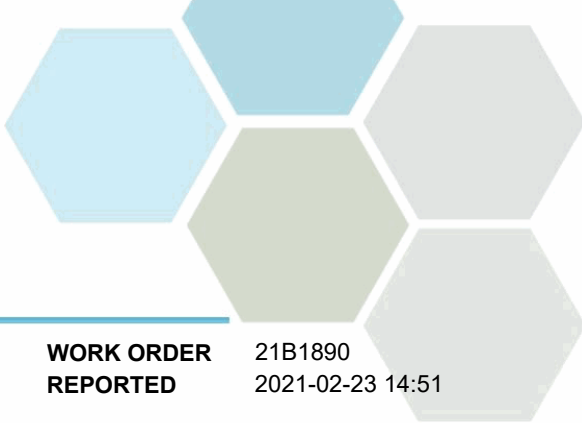
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Authorized By:

Alana Crump
Team Lead, Client Service

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21B1890
2021-02-23 14:51

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21B1890-01) Matrix: Water Sampled: 2021-02-17 11:10					FILT, PRESb

Anions

Chloride	5.94	0.10	mg/L	2021-02-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-02-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-02-19	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-02-19	
Sulfate	27.2	1.0	mg/L	2021-02-19	

Calculated Parameters

Hardness, Total (as CaCO3)	125	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.223	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-02-19	
Conductivity (EC)	270	2.0	µS/cm	2021-02-22	
Nitrogen, Total Kjeldahl	0.223	0.050	mg/L	2021-02-23	
pH	8.09	0.10	pH units	2021-02-22	HT2
Phosphorus, Total (as P)	0.0131	0.0050	mg/L	2021-02-22	
Phosphorus, Total Dissolved	0.0070	0.0050	mg/L	2021-02-22	
Solids, Total Suspended	2.4	2.0	mg/L	2021-02-20	

Total Metals

Calcium, total	33.9	0.20	mg/L	2021-02-22	
Magnesium, total	9.81	0.010	mg/L	2021-02-22	
Sodium, total	12.1	0.10	mg/L	2021-02-22	

Okanagan River Channel 100m Downstream (21B1890-02) | Matrix: Water | Sampled: 2021-02-17 11:30

FILT,
PRESa

Anions

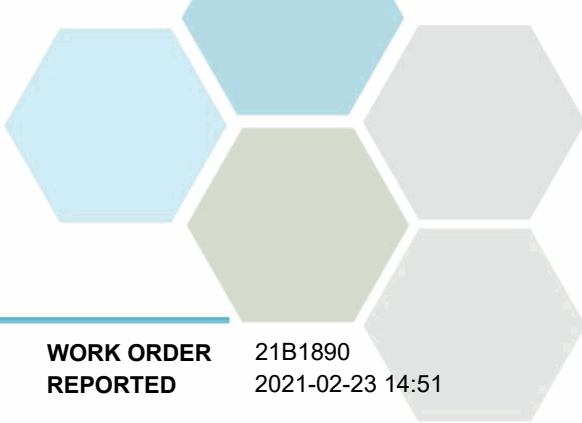
Chloride	6.04	0.10	mg/L	2021-02-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-02-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-02-19	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-02-19	
Sulfate	28.0	1.0	mg/L	2021-02-19	

Calculated Parameters

Hardness, Total (as CaCO3)	132	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.228	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-02-19	
Conductivity (EC)	271	2.0	µS/cm	2021-02-22	
Nitrogen, Total Kjeldahl	0.228	0.050	mg/L	2021-02-23	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21B1890
2021-02-23 14:51

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21B1890-02) Matrix: Water Sampled: 2021-02-17 11:30, Continued					FILT, PRESa

General Parameters, Continued

pH	8.11	0.10	pH units	2021-02-22	HT2
Phosphorus, Total (as P)	0.0125	0.0050	mg/L	2021-02-22	
Phosphorus, Total Dissolved	0.0081	0.0050	mg/L	2021-02-22	
Solids, Total Suspended	2.6	2.0	mg/L	2021-02-20	

Total Metals

Calcium, total	34.8	0.20	mg/L	2021-02-22	
Magnesium, total	11.0	0.010	mg/L	2021-02-22	
Sodium, total	12.4	0.10	mg/L	2021-02-22	

Okanagan River Channel 500m Downstream (21B1890-03) | Matrix: Water | Sampled: 2021-02-17 11:45

FILT, PRES

Anions

Chloride	5.99	0.10	mg/L	2021-02-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-02-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-02-19	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-02-19	
Sulfate	28.0	1.0	mg/L	2021-02-19	

Calculated Parameters

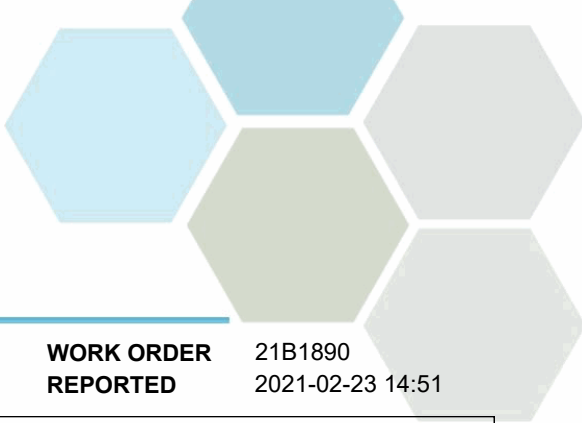
Hardness, Total (as CaCO3)	133	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.233	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-02-19	
Conductivity (EC)	268	2.0	µS/cm	2021-02-22	
Nitrogen, Total Kjeldahl	0.233	0.050	mg/L	2021-02-23	
pH	8.13	0.10	pH units	2021-02-22	HT2
Phosphorus, Total (as P)	0.0187	0.0050	mg/L	2021-02-22	
Phosphorus, Total Dissolved	0.0089	0.0050	mg/L	2021-02-22	
Solids, Total Suspended	4.8	2.0	mg/L	2021-02-20	

Total Metals

Calcium, total	34.8	0.20	mg/L	2021-02-22	
Magnesium, total	11.1	0.010	mg/L	2021-02-22	
Sodium, total	12.7	0.10	mg/L	2021-02-22	



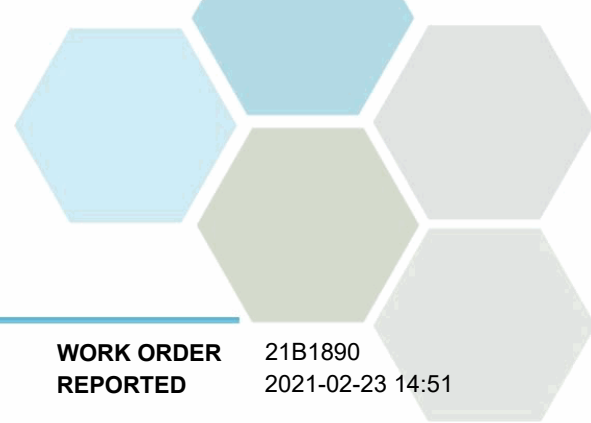
TEST RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls WWTP MORC

WORK ORDER 21B1890
REPORTED 2021-02-23 14:51

Sample Qualifiers:

- FILT The sample has been filtered for DP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for DP, TKN, NH3, TP in the laboratory and the holding time has been extended.
- PRESa Sample has been preserved for DP, TP, TKN, NH3 in the laboratory and the holding time has been extended.
- PRESb Sample has been preserved for TKN, NH3, TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21B1890
2021-02-23 14:51

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21C2518

RECEIVED / TEMP 2021-03-18 11:30 / 4°C

REPORTED 2021-03-19 16:48

COC NUMBER B104526

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

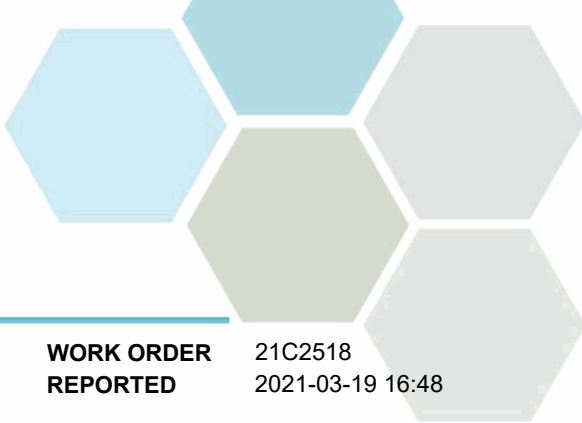
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

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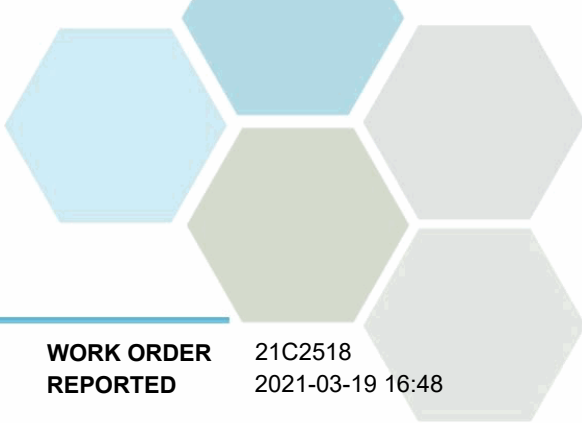


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2518
2021-03-19 16:48

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream - Bacteria (21C2518-01) Matrix: Water Sampled: 2021-03-17 11:15					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-03-18	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-03-18	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2518
2021-03-19 16:48

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21C2545
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-03-18 11:30 / 4°C 2021-03-25 16:37
PO NUMBER	OK Falls WW	COC NUMBER	B104526
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

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Custody Seals Intact: YES

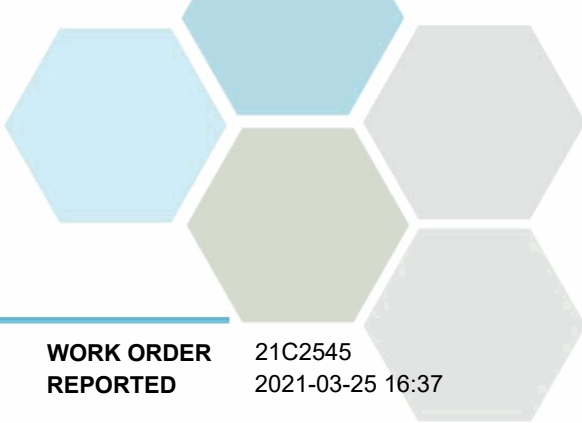
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2545
2021-03-25 16:37

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21C2545-01) Matrix: Water Sampled: 2021-03-17 11:15					FILT, PRES

Anions

Chloride	6.00	0.10	mg/L	2021-03-18	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-03-18	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-03-18	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-03-18	
Sulfate	30.0	1.0	mg/L	2021-03-18	

Calculated Parameters

Hardness, Total (as CaCO3)	116	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.206	0.0500	mg/L	N/A	

General Parameters

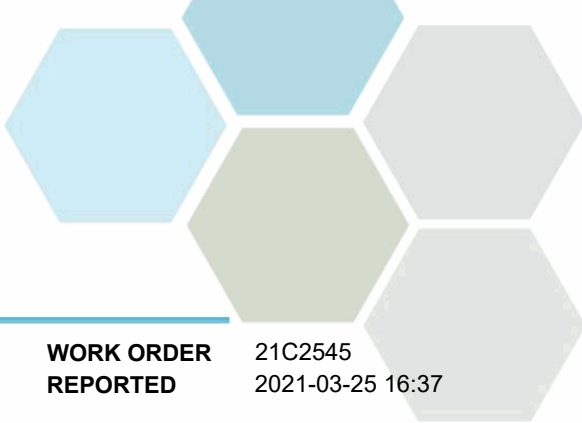
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-03-19	
Conductivity (EC)	283	2.0	µS/cm	2021-03-22	
Nitrogen, Total Kjeldahl	0.206	0.050	mg/L	2021-03-23	
pH	8.03	0.10	pH units	2021-03-22	HT2
Phosphorus, Total (as P)	0.0108	0.0050	mg/L	2021-03-23	
Phosphorus, Total Dissolved	0.0061	0.0050	mg/L	2021-03-23	
Solids, Total Suspended	2.0	2.0	mg/L	2021-03-23	

Total Metals

Calcium, total	31.5	0.20	mg/L	2021-03-23	
Magnesium, total	9.13	0.010	mg/L	2021-03-23	
Potassium, total	2.37	0.10	mg/L	2021-03-23	
Sodium, total	11.6	0.10	mg/L	2021-03-23	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TKN, NH3, TP, TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2545
2021-03-25 16:37

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21C2546

RECEIVED / TEMP 2021-03-18 11:30 / 4°C

REPORTED 2021-03-25 16:14

COC NUMBER B104526

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.

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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.

Work Order Comments:

Custody Seals Intact: YES

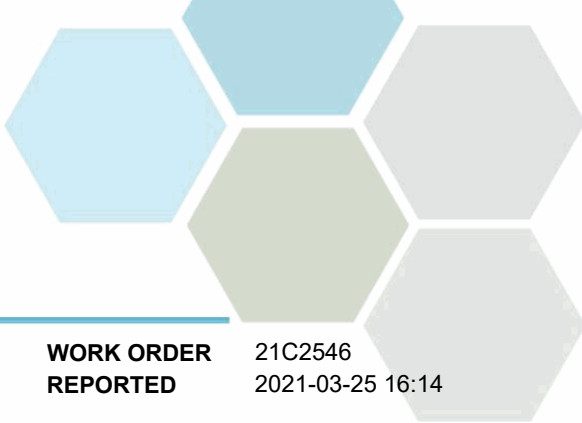
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Authorized By:

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2546
2021-03-25 16:14

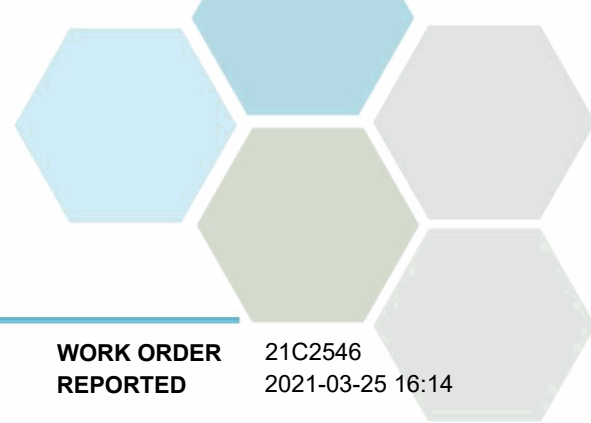
Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21C2546-01) Matrix: Water Sampled: 2021-03-17 11:30					FILT, PRES
Anions					
Chloride	6.06	0.10	mg/L	2021-03-18	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-03-18	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-03-18	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-03-18	
Sulfate	30.5	1.0	mg/L	2021-03-18	
Calculated Parameters					
Hardness, Total (as CaCO3)	109	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.212	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	0.051	0.050	mg/L	2021-03-19	
Conductivity (EC)	284	2.0	µS/cm	2021-03-22	
Nitrogen, Total Kjeldahl	0.212	0.050	mg/L	2021-03-24	
pH	8.11	0.10	pH units	2021-03-22	HT2
Phosphorus, Total (as P)	0.0091	0.0050	mg/L	2021-03-23	
Phosphorus, Total Dissolved	0.0064	0.0050	mg/L	2021-03-23	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-03-23	
Total Metals					
Calcium, total	29.5	0.20	mg/L	2021-03-23	
Magnesium, total	8.53	0.010	mg/L	2021-03-23	
Potassium, total	2.19	0.10	mg/L	2021-03-23	
Sodium, total	10.6	0.10	mg/L	2021-03-23	

Sample Qualifiers:

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

PRES Sample has been preserved for TDP, NH3, TKN, TP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2546
2021-03-25 16:14

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21C2547

RECEIVED / TEMP 2021-03-18 11:30 / 4°C
REPORTED 2021-03-19 16:47

COC NUMBER B104526

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.

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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.

Work Order Comments:

Custody Seals Intact: YES

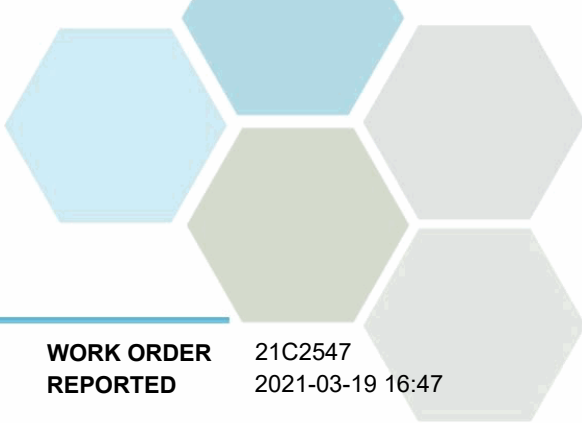
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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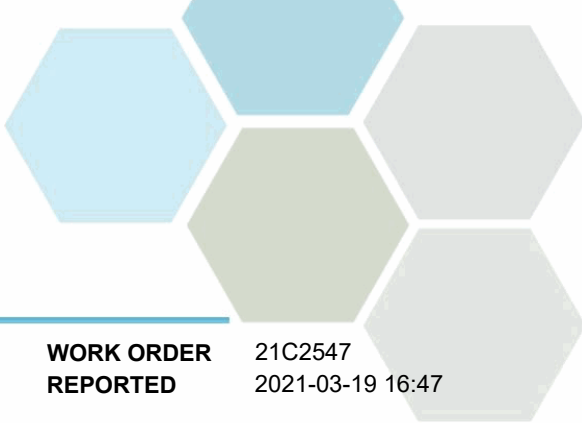


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2547
2021-03-19 16:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream - Bacteria (21C2547-01) Matrix: Water Sampled: 2021-03-17 11:30					
<i>Microbiological Parameters</i>					
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-03-18	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-03-18	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2547
2021-03-19 16:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21C2548

RECEIVED / TEMP 2021-03-18 11:30 / 4°C

REPORTED 2021-03-25 16:16

COC NUMBER B104526

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

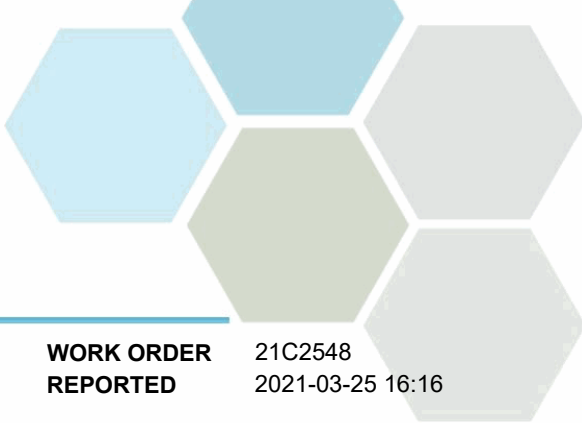
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Authorized By:

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TEST RESULTS

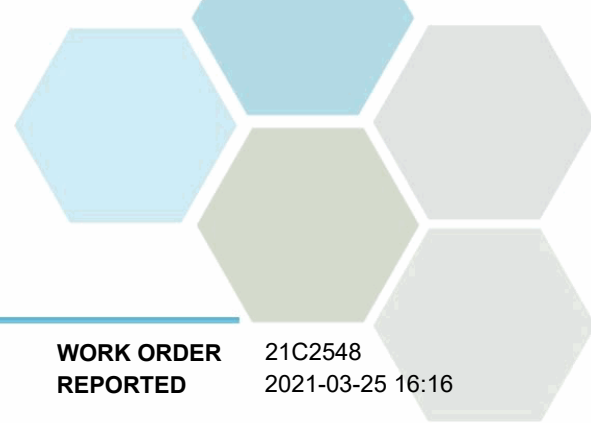
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2548
2021-03-25 16:16

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 500m Downstream (21C2548-01) Matrix: Water Sampled: 2021-03-17 11:45					FILT, PRES
Anions					
Chloride	6.05	0.10	mg/L	2021-03-18	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-03-18	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-03-18	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-03-18	
Sulfate	41.7	1.0	mg/L	2021-03-18	
Calculated Parameters					
Hardness, Total (as CaCO3)	111	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.202	0.0500	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	0.061	0.050	mg/L	2021-03-19	
Conductivity (EC)	278	2.0	µS/cm	2021-03-22	
Nitrogen, Total Kjeldahl	0.202	0.050	mg/L	2021-03-24	
pH	8.14	0.10	pH units	2021-03-22	HT2
Phosphorus, Total (as P)	0.0102	0.0050	mg/L	2021-03-23	
Phosphorus, Total Dissolved	0.0066	0.0050	mg/L	2021-03-23	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-03-23	
Total Metals					
Calcium, total	29.8	0.20	mg/L	2021-03-23	
Magnesium, total	8.94	0.010	mg/L	2021-03-23	
Potassium, total	2.29	0.10	mg/L	2021-03-23	
Sodium, total	11.0	0.10	mg/L	2021-03-23	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
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APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2548
2021-03-25 16:16

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21C2549
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-03-18 11:30 / 4°C 2021-03-19 16:52
PO NUMBER	OK Falls WW	COC NUMBER	B104526
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

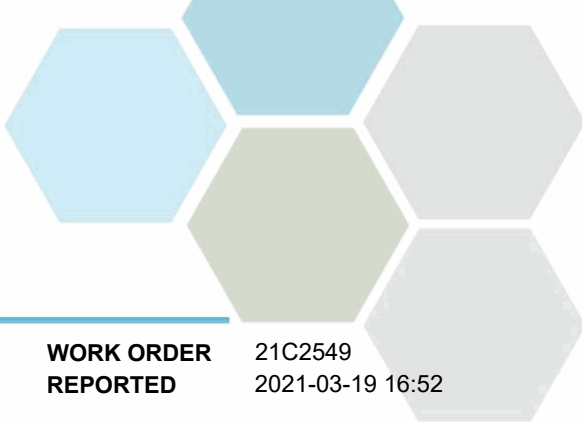
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

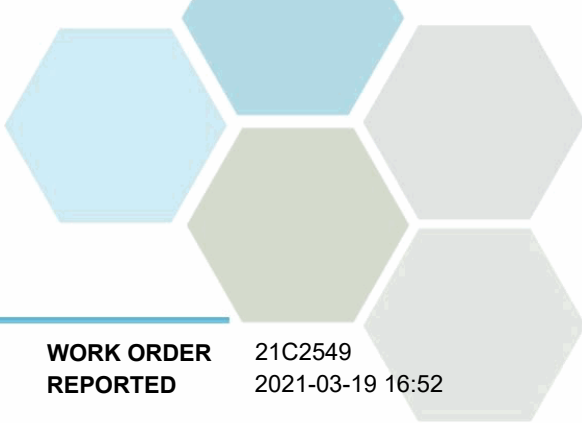
WORK ORDER REPORTED 21C2549
2021-03-19 16:52

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 500m Downstream - Bacteria (21C2549-01) | Matrix: Water | Sampled: 2021-03-17 11:45

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-03-18	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-03-18	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21C2549
2021-03-19 16:52

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21D2209
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-04-21 12:40 / 8°C 2021-04-28 12:43
PO NUMBER	OK Falls WW	COC NUMBER	B104532
PROJECT	OK Falls WWTP QORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

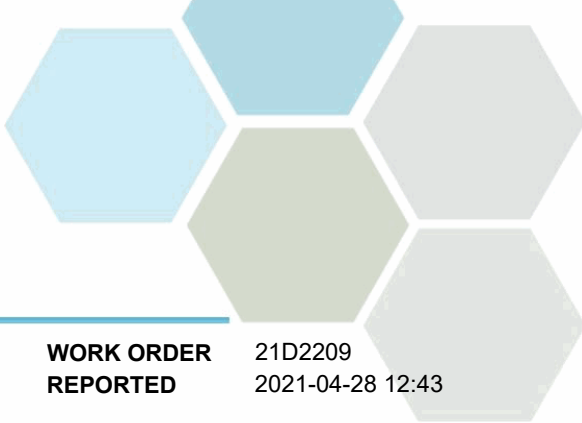
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

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#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2209
2021-04-28 12:43

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21D2209-01) Matrix: Water Sampled: 2021-04-20 12:50					FILT, PRES

Anions

Chloride	5.61	0.10	mg/L	2021-04-22	
Fluoride	0.17	0.10	mg/L	2021-04-22	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-22	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-22	
Sulfate	27.5	1.0	mg/L	2021-04-22	

Calculated Parameters

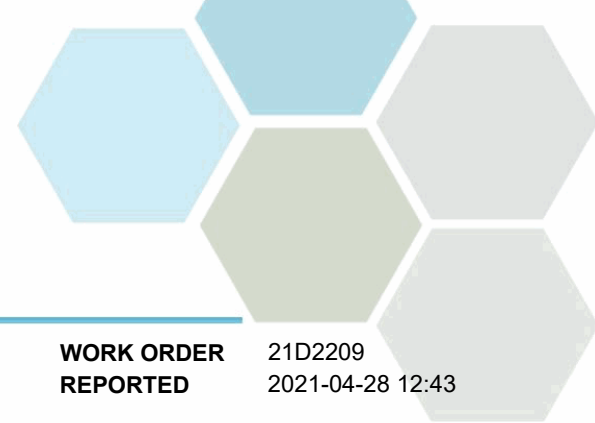
Hardness, Total (as CaCO3)	109	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.186	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	115	1.0	mg/L	2021-04-27	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Bicarbonate (as CaCO3)	115	1.0	mg/L	2021-04-27	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-04-22	
BOD, 5-day	< 1.3	2.0	mg/L	2021-04-27	
Chemical Oxygen Demand	11	20	mg/L	2021-04-28	
Conductivity (EC)	261	2.0	µS/cm	2021-04-27	
Nitrogen, Total Kjeldahl	0.186	0.050	mg/L	2021-04-26	
pH	8.08	0.10	pH units	2021-04-27	HT2
Phosphorus, Total (as P)	0.0310	0.0050	mg/L	2021-04-26	
Phosphorus, Total Dissolved	0.0081	0.0050	mg/L	2021-04-26	
Solids, Total Suspended	11.2	2.0	mg/L	2021-04-25	

Total Metals

Aluminum, total	0.234	0.0050	mg/L	2021-04-24	
Antimony, total	< 0.00020	0.00020	mg/L	2021-04-24	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-04-24	
Barium, total	0.0278	0.0050	mg/L	2021-04-24	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-04-24	
Boron, total	< 0.0500	0.0500	mg/L	2021-04-24	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-04-24	
Calcium, total	28.6	0.20	mg/L	2021-04-24	
Chromium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Cobalt, total	0.00014	0.00010	mg/L	2021-04-24	
Copper, total	0.00145	0.00040	mg/L	2021-04-24	
Iron, total	0.209	0.010	mg/L	2021-04-24	
Lead, total	< 0.00020	0.00020	mg/L	2021-04-24	
Lithium, total	0.00347	0.00010	mg/L	2021-04-24	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2209
2021-04-28 12:43

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21D2209-01) Matrix: Water Sampled: 2021-04-20 12:50, Continued					FILT, PRES

Total Metals, Continued

Magnesium, total	9.01	0.010	mg/L	2021-04-24	
Manganese, total	0.0161	0.00020	mg/L	2021-04-24	
Mercury, total	< 0.000010	0.000010	mg/L	2021-04-24	
Molybdenum, total	0.00308	0.00010	mg/L	2021-04-24	
Nickel, total	0.00069	0.00040	mg/L	2021-04-24	
Phosphorus, total	< 0.050	0.050	mg/L	2021-04-24	
Potassium, total	2.39	0.10	mg/L	2021-04-24	
Selenium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Silicon, total	2.6	1.0	mg/L	2021-04-24	
Silver, total	< 0.000050	0.000050	mg/L	2021-04-24	
Sodium, total	11.4	0.10	mg/L	2021-04-24	
Strontium, total	0.269	0.0010	mg/L	2021-04-24	
Sulfur, total	9.9	3.0	mg/L	2021-04-24	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Thallium, total	< 0.000020	0.000020	mg/L	2021-04-24	
Thorium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Tin, total	< 0.00020	0.00020	mg/L	2021-04-24	
Titanium, total	0.0132	0.0050	mg/L	2021-04-24	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-04-24	
Uranium, total	0.00248	0.000020	mg/L	2021-04-24	
Vanadium, total	0.0013	0.0010	mg/L	2021-04-24	
Zinc, total	< 0.0040	0.0040	mg/L	2021-04-24	
Zirconium, total	0.00017	0.00010	mg/L	2021-04-24	

Okanagan River Channel 100m Downstream (21D2209-02) | Matrix: Water | Sampled: 2021-04-20 13:15

FILT, PRES

Anions

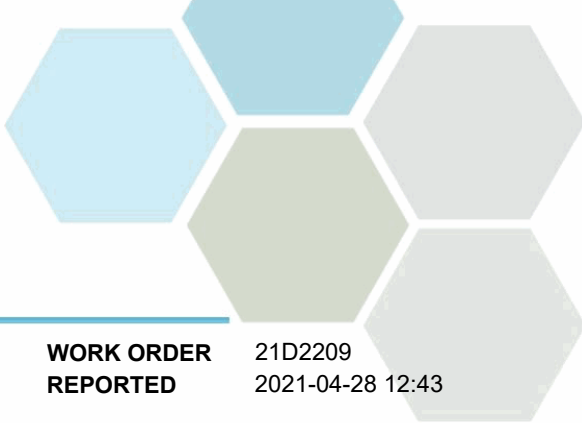
Chloride	5.88	0.10	mg/L	2021-04-22	
Fluoride	0.16	0.10	mg/L	2021-04-22	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-22	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-22	
Sulfate	29.2	1.0	mg/L	2021-04-22	

Calculated Parameters

Hardness, Total (as CaCO3)	112	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.216	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	122	1.0	mg/L	2021-04-27	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2209
2021-04-28 12:43

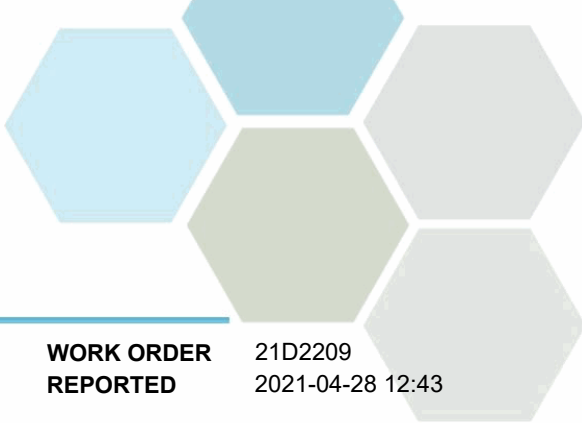
Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21D2209-02) Matrix: Water Sampled: 2021-04-20 13:15, Continued					FILT, PRES

General Parameters, Continued

Alkalinity, Bicarbonate (as CaCO3)	122	1.0	mg/L	2021-04-27	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-04-22	
BOD, 5-day	< 1.3	2.0	mg/L	2021-04-27	
Chemical Oxygen Demand	12	20	mg/L	2021-04-28	
Conductivity (EC)	280	2.0	µS/cm	2021-04-27	
Nitrogen, Total Kjeldahl	0.216	0.050	mg/L	2021-04-26	
pH	8.12	0.10	pH units	2021-04-27	HT2
Phosphorus, Total (as P)	0.0260	0.0050	mg/L	2021-04-26	
Phosphorus, Total Dissolved	0.0055	0.0050	mg/L	2021-04-26	
Solids, Total Suspended	11.2	2.0	mg/L	2021-04-25	

Total Metals

Aluminum, total	0.330	0.0050	mg/L	2021-04-24	
Antimony, total	< 0.00020	0.00020	mg/L	2021-04-24	
Arsenic, total	0.00053	0.00050	mg/L	2021-04-24	
Barium, total	0.0332	0.0050	mg/L	2021-04-24	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-04-24	
Boron, total	< 0.0500	0.0500	mg/L	2021-04-24	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-04-24	
Calcium, total	30.2	0.20	mg/L	2021-04-24	
Chromium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Cobalt, total	0.00018	0.00010	mg/L	2021-04-24	
Copper, total	0.00085	0.00040	mg/L	2021-04-24	
Iron, total	0.329	0.010	mg/L	2021-04-24	
Lead, total	< 0.00020	0.00020	mg/L	2021-04-24	
Lithium, total	0.00367	0.00010	mg/L	2021-04-24	
Magnesium, total	8.96	0.010	mg/L	2021-04-24	
Manganese, total	0.0208	0.00020	mg/L	2021-04-24	
Mercury, total	< 0.000010	0.000010	mg/L	2021-04-24	
Molybdenum, total	0.00363	0.00010	mg/L	2021-04-24	
Nickel, total	0.00071	0.00040	mg/L	2021-04-24	
Phosphorus, total	< 0.050	0.050	mg/L	2021-04-24	
Potassium, total	2.38	0.10	mg/L	2021-04-24	
Selenium, total	< 0.00050	0.00050	mg/L	2021-04-24	
Silicon, total	3.1	1.0	mg/L	2021-04-24	
Silver, total	< 0.000050	0.000050	mg/L	2021-04-24	
Sodium, total	12.0	0.10	mg/L	2021-04-24	
Strontium, total	0.281	0.0010	mg/L	2021-04-24	
Sulfur, total	11.4	3.0	mg/L	2021-04-24	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-04-24	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2209
2021-04-28 12:43

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21D2209-02) Matrix: Water Sampled: 2021-04-20 13:15, Continued					FILT, PRES

Total Metals, Continued

Thallium, total	< 0.000020	0.000020	mg/L	2021-04-24	
Thorium, total	< 0.00010	0.00010	mg/L	2021-04-24	
Tin, total	< 0.00020	0.00020	mg/L	2021-04-24	
Titanium, total	0.0215	0.0050	mg/L	2021-04-24	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-04-24	
Uranium, total	0.00256	0.000020	mg/L	2021-04-24	
Vanadium, total	0.0015	0.0010	mg/L	2021-04-24	
Zinc, total	0.0051	0.0040	mg/L	2021-04-24	
Zirconium, total	0.00012	0.00010	mg/L	2021-04-24	

Field Blank - 100m D/S (21D2209-03) | Matrix: Water | Sampled: 2021-04-20 13:25

FILT,
PRES

Anions

Chloride	< 0.10	0.10	mg/L	2021-04-22	
Fluoride	< 0.10	0.10	mg/L	2021-04-22	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-22	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-22	
Sulfate	< 1.0	1.0	mg/L	2021-04-22	

Calculated Parameters

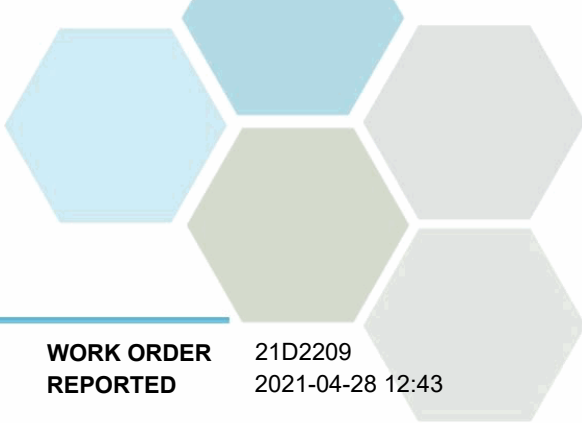
Hardness, Total (as CaCO3)	< 0.500	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-04-22	
BOD, 5-day	< 1.3	2.0	mg/L	2021-04-27	
Chemical Oxygen Demand	< 5	20	mg/L	2021-04-28	
Conductivity (EC)	< 2.0	2.0	µS/cm	2021-04-27	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-04-26	
pH	5.63	0.10	pH units	2021-04-27	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-04-26	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-04-26	
Solids, Total Suspended	< 4.0	2.0	mg/L	2021-04-25	

Total Metals

Aluminum, total	< 0.0050	0.0050	mg/L	2021-04-25	
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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2209
2021-04-28 12:43

Analyte	Result	RL	Units	Analyzed	Qualifier
Field Blank - 100m D/S (21D2209-03) Matrix: Water Sampled: 2021-04-20 13:25, Continued					FILT, PRES

Total Metals, Continued

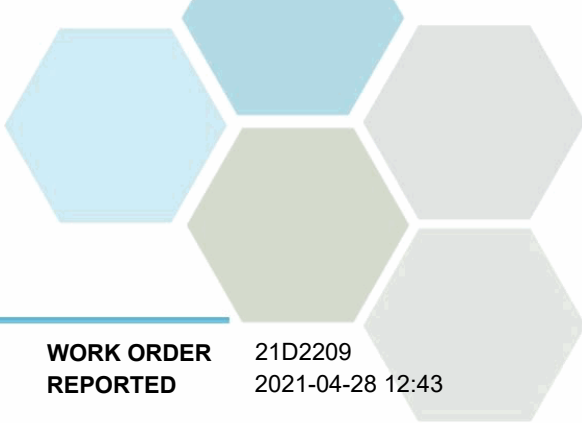
Antimony, total	< 0.00020	0.00020	mg/L	2021-04-25	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-04-25	
Barium, total	< 0.0050	0.0050	mg/L	2021-04-25	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-04-25	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-04-25	
Boron, total	< 0.0500	0.0500	mg/L	2021-04-25	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-04-25	
Calcium, total	< 0.20	0.20	mg/L	2021-04-25	
Chromium, total	< 0.00050	0.00050	mg/L	2021-04-25	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-04-25	
Copper, total	< 0.00040	0.00040	mg/L	2021-04-25	
Iron, total	< 0.010	0.010	mg/L	2021-04-25	
Lead, total	< 0.00020	0.00020	mg/L	2021-04-25	
Lithium, total	< 0.00010	0.00010	mg/L	2021-04-25	
Magnesium, total	< 0.010	0.010	mg/L	2021-04-25	
Manganese, total	< 0.00020	0.00020	mg/L	2021-04-25	
Mercury, total	< 0.000010	0.000010	mg/L	2021-04-24	
Molybdenum, total	0.00018	0.00010	mg/L	2021-04-25	
Nickel, total	< 0.00040	0.00040	mg/L	2021-04-25	
Phosphorus, total	< 0.050	0.050	mg/L	2021-04-25	
Potassium, total	< 0.10	0.10	mg/L	2021-04-25	
Selenium, total	< 0.00050	0.00050	mg/L	2021-04-25	
Silicon, total	< 1.0	1.0	mg/L	2021-04-25	
Silver, total	< 0.000050	0.000050	mg/L	2021-04-25	
Sodium, total	< 0.10	0.10	mg/L	2021-04-25	
Strontium, total	< 0.0010	0.0010	mg/L	2021-04-25	
Sulfur, total	< 3.0	3.0	mg/L	2021-04-25	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-04-25	
Thallium, total	< 0.000020	0.000020	mg/L	2021-04-25	
Thorium, total	< 0.00010	0.00010	mg/L	2021-04-25	
Tin, total	< 0.00020	0.00020	mg/L	2021-04-25	
Titanium, total	< 0.0050	0.0050	mg/L	2021-04-25	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-04-25	
Uranium, total	< 0.000020	0.000020	mg/L	2021-04-25	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-04-25	
Zinc, total	< 0.0040	0.0040	mg/L	2021-04-25	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-04-25	

Okanagan River Channel 500m Downstream (21D2209-04) | Matrix: Water | Sampled: 2021-04-20 13:45

FILT, PRES

Anions

Chloride	5.90	0.10	mg/L	2021-04-22	
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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2209
2021-04-28 12:43

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 500m Downstream (21D2209-04) Matrix: Water Sampled: 2021-04-20 13:45, Continued					FILT, PRES

Anions, Continued

Fluoride	0.17	0.10	mg/L	2021-04-22	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-22	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-22	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-22	
Sulfate	29.0	1.0	mg/L	2021-04-22	

Calculated Parameters

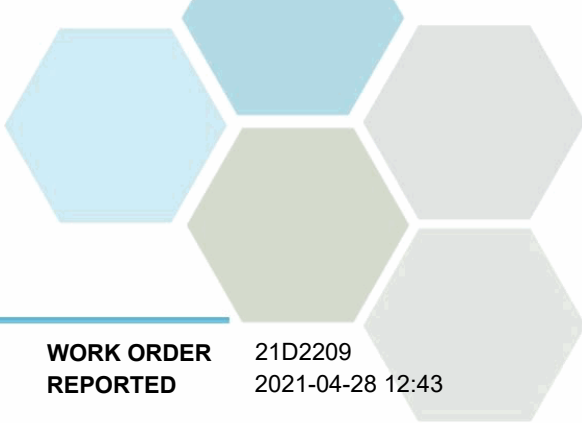
Hardness, Total (as CaCO3)	114	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.235	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	118	1.0	mg/L	2021-04-27	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Bicarbonate (as CaCO3)	118	1.0	mg/L	2021-04-27	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-27	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-04-22	
BOD, 5-day	< 1.3	2.0	mg/L	2021-04-27	
Chemical Oxygen Demand	12	20	mg/L	2021-04-28	
Conductivity (EC)	280	2.0	µS/cm	2021-04-27	
Nitrogen, Total Kjeldahl	0.235	0.050	mg/L	2021-04-26	
pH	8.15	0.10	pH units	2021-04-27	HT2
Phosphorus, Total (as P)	0.0293	0.0050	mg/L	2021-04-26	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-04-26	
Solids, Total Suspended	9.6	2.0	mg/L	2021-04-25	

Total Metals

Aluminum, total	0.346	0.0050	mg/L	2021-04-25	
Antimony, total	< 0.00020	0.00020	mg/L	2021-04-25	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-04-25	
Barium, total	0.0300	0.0050	mg/L	2021-04-25	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-04-25	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-04-25	
Boron, total	< 0.0500	0.0500	mg/L	2021-04-25	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-04-25	
Calcium, total	30.5	0.20	mg/L	2021-04-25	
Chromium, total	< 0.00050	0.00050	mg/L	2021-04-25	
Cobalt, total	0.00017	0.00010	mg/L	2021-04-25	
Copper, total	0.00170	0.00040	mg/L	2021-04-25	
Iron, total	0.344	0.010	mg/L	2021-04-25	
Lead, total	< 0.00020	0.00020	mg/L	2021-04-25	
Lithium, total	0.00367	0.00010	mg/L	2021-04-25	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2209
2021-04-28 12:43

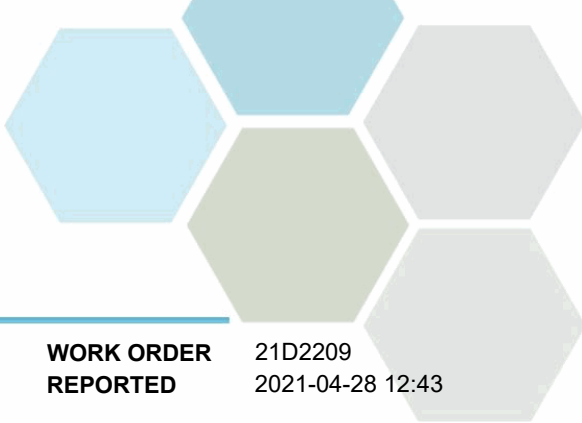
Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 500m Downstream (21D2209-04) Matrix: Water Sampled: 2021-04-20 13:45, Continued					FILT, PRES

Total Metals, Continued

Magnesium, total	9.26	0.010	mg/L	2021-04-25	
Manganese, total	0.0202	0.00020	mg/L	2021-04-25	
Mercury, total	< 0.000010	0.000010	mg/L	2021-04-24	
Molybdenum, total	0.00350	0.00010	mg/L	2021-04-25	
Nickel, total	0.00074	0.00040	mg/L	2021-04-25	
Phosphorus, total	< 0.050	0.050	mg/L	2021-04-25	
Potassium, total	2.44	0.10	mg/L	2021-04-25	
Selenium, total	< 0.00050	0.00050	mg/L	2021-04-25	
Silicon, total	2.6	1.0	mg/L	2021-04-25	
Silver, total	< 0.000050	0.000050	mg/L	2021-04-25	
Sodium, total	11.8	0.10	mg/L	2021-04-25	
Strontium, total	0.287	0.0010	mg/L	2021-04-25	
Sulfur, total	9.8	3.0	mg/L	2021-04-25	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-04-25	
Thallium, total	< 0.000020	0.000020	mg/L	2021-04-25	
Thorium, total	< 0.00010	0.00010	mg/L	2021-04-25	
Tin, total	< 0.00020	0.00020	mg/L	2021-04-25	
Titanium, total	0.0251	0.0050	mg/L	2021-04-25	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-04-25	
Uranium, total	0.00268	0.000020	mg/L	2021-04-25	
Vanadium, total	0.0014	0.0010	mg/L	2021-04-25	
Zinc, total	< 0.0040	0.0040	mg/L	2021-04-25	
Zirconium, total	0.00018	0.00010	mg/L	2021-04-25	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

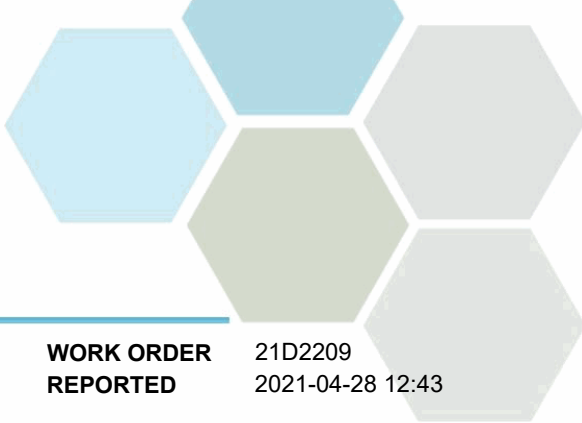
WORK ORDER REPORTED 21D2209
2021-04-28 12:43

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2209
2021-04-28 12:43

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QORC

PROJECT INFO

WORK ORDER 21D2212

RECEIVED / TEMP 2021-04-21 12:40 / 8°C

REPORTED 2021-04-23 09:47

COC NUMBER B104532

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.

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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.

Work Order Comments:

Custody Seals Intact: YES

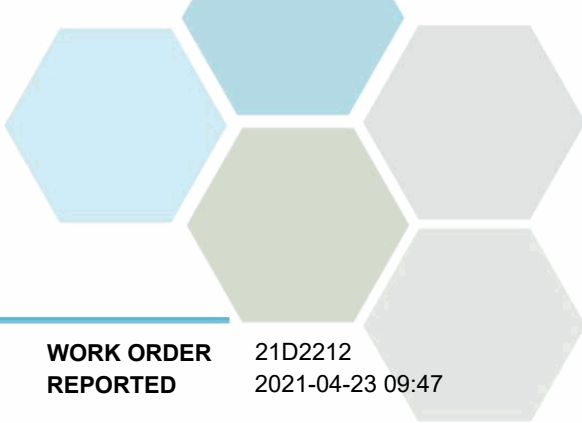
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2212
2021-04-23 09:47

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21D2212-01) | Matrix: Water | Sampled: 2021-04-20 12:50

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	9	1	MPN/100 mL	2021-04-21	
E. coli (Q-Tray)	9	1	MPN/100 mL	2021-04-21	

Okanagan River Channel 100m Downstream - Bacteria (21D2212-02) | Matrix: Water | Sampled: 2021-04-20 13:15

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	16	1	MPN/100 mL	2021-04-21	
E. coli (Q-Tray)	14	1	MPN/100 mL	2021-04-21	

Field Blank - 100m D/S - Bacteria (21D2212-03) | Matrix: Water | Sampled: 2021-04-20 13:25

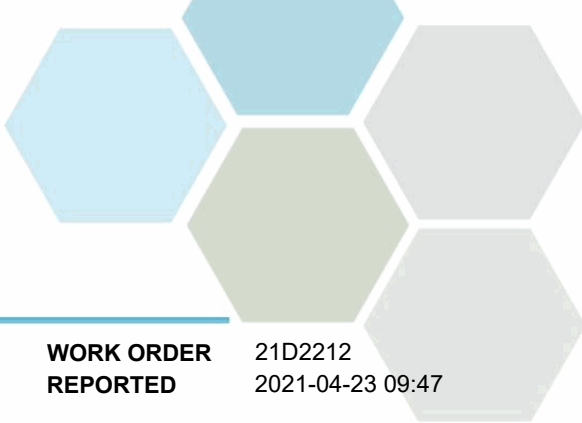
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-04-21	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-04-21	

Okanagan River Channel 500m Downstream - Bacteria (21D2212-04) | Matrix: Water | Sampled: 2021-04-20 13:45

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	4	1	MPN/100 mL	2021-04-21	
E. coli (Q-Tray)	4	1	MPN/100 mL	2021-04-21	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21D2212
2021-04-23 09:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

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
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21E0634

RECEIVED / TEMP 2021-05-06 10:50 / 7°C

REPORTED 2021-05-10 10:56

COC NUMBER B104534

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.

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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.

Work Order Comments:

Custody Seals Intact: YES

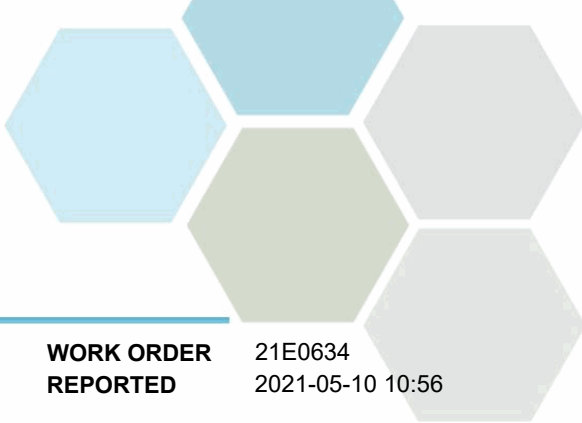
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E0634
2021-05-10 10:56

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21E0634-01) | Matrix: Water | Sampled: 2021-05-05 11:15

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	3	1	MPN/100 mL	2021-05-06	
E. coli (Q-Tray)	3	1	MPN/100 mL	2021-05-06	

Okanagan River Channel 100m Downstream - Bacteria (21E0634-02) | Matrix: Water | Sampled: 2021-05-05 11:25

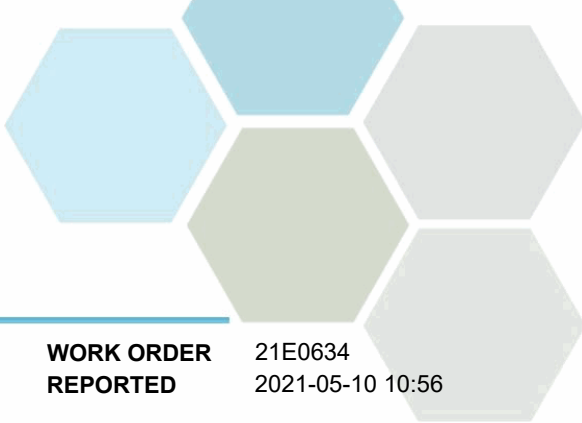
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2021-05-06	
E. coli (Q-Tray)	< 1	1	MPN/100 mL	2021-05-06	

Okanagan River Channel 500m Downstream - Bacteria (21E0634-03) | Matrix: Water | Sampled: 2021-05-05 11:30

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	2	1	MPN/100 mL	2021-05-06	
E. coli (Q-Tray)	2	1	MPN/100 mL	2021-05-06	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E0634
2021-05-10 10:56

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E1315
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-12 15:30 / 5°C 2021-05-19 15:15
PO NUMBER	OK Falls WW	COC NUMBER	B099123
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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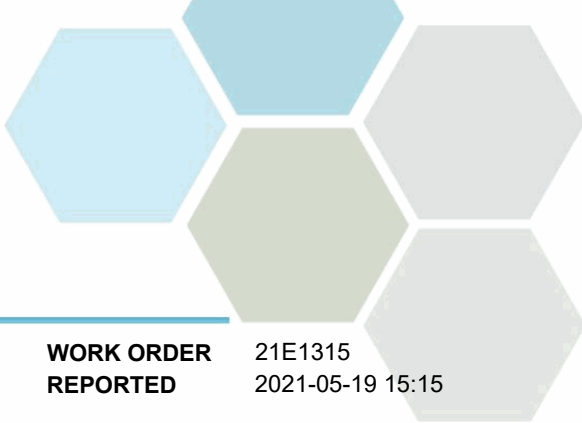
<p><i>Big Picture Sidekicks</i></p>  <p>You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.</p>	<p><i>We've Got Chemistry</i></p>  <p>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.</p>	<p><i>Ahead of the Curve</i></p>  <p>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.</p>
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Work Order Comments: Custody Seals Intact: YES

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

Authorized By:

Brent Whitehead
Client Scientist - Team Lead



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E1315
2021-05-19 15:15

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21E1315-01) | Matrix: Water | Sampled: 2021-05-11 10:30

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	15	1	MPN/100 mL	2021-05-12	HT1
E. coli (Q-Tray)	15	1	MPN/100 mL	2021-05-12	HT1

Okanagan River Channel 100m Upstream (21E1315-02) | Matrix: Water | Sampled: 2021-05-11 10:30

FILT,
PRESa

Anions

Chloride	5.55	0.10	mg/L	2021-05-14	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-05-14	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-14	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-05-14	
Sulfate	26.7	1.0	mg/L	2021-05-14	

Calculated Parameters

Hardness, Total (as CaCO3)	111	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.334	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-05-17	
Conductivity (EC)	265	2.0	µS/cm	2021-05-14	
Nitrogen, Total Kjeldahl	0.334	0.050	mg/L	2021-05-17	
pH	8.15	0.10	pH units	2021-05-14	HT2
Phosphorus, Total (as P)	0.0131	0.0050	mg/L	2021-05-17	
Phosphorus, Total Dissolved	0.0072	0.0050	mg/L	2021-05-17	
Solids, Total Suspended	4.0	2.0	mg/L	2021-05-19	HT1

Total Metals

Calcium, total	29.1	0.20	mg/L	2021-05-17	
Magnesium, total	9.41	0.010	mg/L	2021-05-17	
Potassium, total	2.48	0.10	mg/L	2021-05-17	
Sodium, total	12.1	0.10	mg/L	2021-05-17	

Okanagan River Channel 100m Downstream - Bacteria (21E1315-03) | Matrix: Water | Sampled: 2021-05-11 10:50

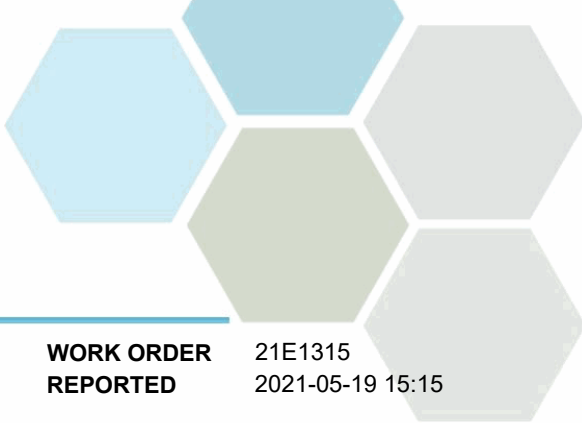
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	11	1	MPN/100 mL	2021-05-12	HT1
E. coli (Q-Tray)	11	1	MPN/100 mL	2021-05-12	HT1

Okanagan River Channel 100m Downstream (21E1315-04) | Matrix: Water | Sampled: 2021-05-11 10:50

FILT,
PRES

Anions



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E1315
2021-05-19 15:15

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21E1315-04) Matrix: Water Sampled: 2021-05-11 10:50, Continued					FILT, PRES

Anions, Continued

Chloride	5.70	0.10	mg/L	2021-05-14	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-05-14	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-14	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-05-14	
Sulfate	28.6	1.0	mg/L	2021-05-14	

Calculated Parameters

Hardness, Total (as CaCO3)	113	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.207	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-05-17	
Conductivity (EC)	271	2.0	µS/cm	2021-05-14	
Nitrogen, Total Kjeldahl	0.207	0.050	mg/L	2021-05-17	
pH	8.22	0.10	pH units	2021-05-14	HT2
Phosphorus, Total (as P)	0.0131	0.0050	mg/L	2021-05-17	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-05-17	
Solids, Total Suspended	< 4.0	2.0	mg/L	2021-05-19	HT1

Total Metals

Calcium, total	29.8	0.20	mg/L	2021-05-17	
Magnesium, total	9.44	0.010	mg/L	2021-05-17	
Potassium, total	2.47	0.10	mg/L	2021-05-17	
Sodium, total	12.7	0.10	mg/L	2021-05-17	

Okanagan River Channel 500m Downstream - Bacteria (21E1315-05) | Matrix: Water | Sampled: 2021-05-11 11:20

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	9	1	MPN/100 mL	2021-05-12	HT1
E. coli (Q-Tray)	8	1	MPN/100 mL	2021-05-12	HT1

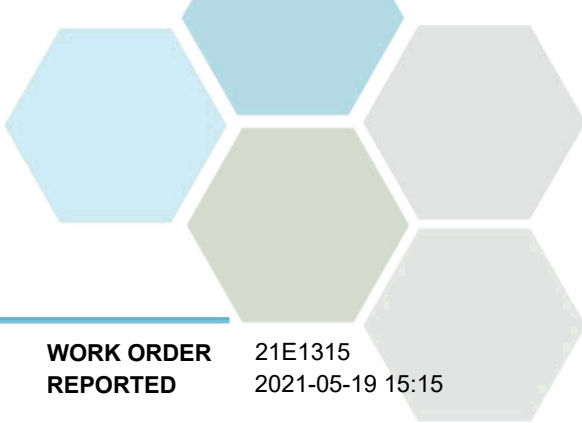
Okanagan River Channel 500m Downstream (21E1315-06) | Matrix: Water | Sampled: 2021-05-11 11:00

FILT, PRESb

Anions

Chloride	5.71	0.10	mg/L	2021-05-14	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-05-14	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-14	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-05-14	
Sulfate	27.0	1.0	mg/L	2021-05-14	

Calculated Parameters



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E1315
2021-05-19 15:15

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 500m Downstream (21E1315-06) Matrix: Water Sampled: 2021-05-11 11:00, Continued					FILT, PRESb

Calculated Parameters, Continued

Hardness, Total (as CaCO3)	113	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.223	0.0500	mg/L	N/A	

General Parameters

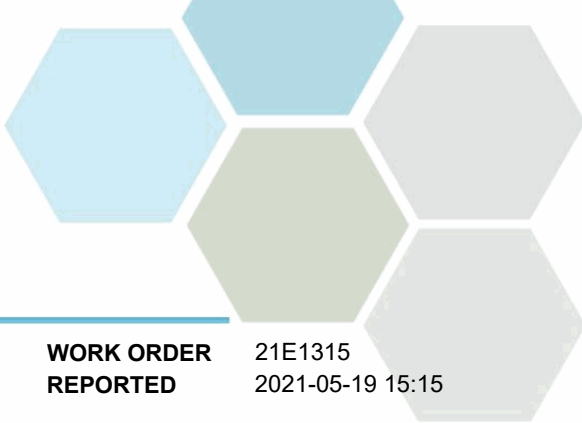
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-05-17	
Conductivity (EC)	274	2.0	µS/cm	2021-05-14	
Nitrogen, Total Kjeldahl	0.223	0.050	mg/L	2021-05-17	
pH	8.24	0.10	pH units	2021-05-14	HT2
Phosphorus, Total (as P)	0.0090	0.0050	mg/L	2021-05-17	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-05-17	
Solids, Total Suspended	4.4	2.0	mg/L	2021-05-19	HT1

Total Metals

Calcium, total	29.5	0.20	mg/L	2021-05-17	
Magnesium, total	9.46	0.010	mg/L	2021-05-17	
Potassium, total	2.46	0.10	mg/L	2021-05-17	
Sodium, total	12.5	0.10	mg/L	2021-05-17	

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- 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.
- PRES Sample has been preserved for TDP, TP, NH3, TKN in the laboratory and the holding time has been extended.
- PRESa Sample has been preserved for TDP, TP, TKN, NH3 in the laboratory and the holding time has been extended.
- PRESb Sample has been preserved for TKN, TDP, TP, NH3 in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

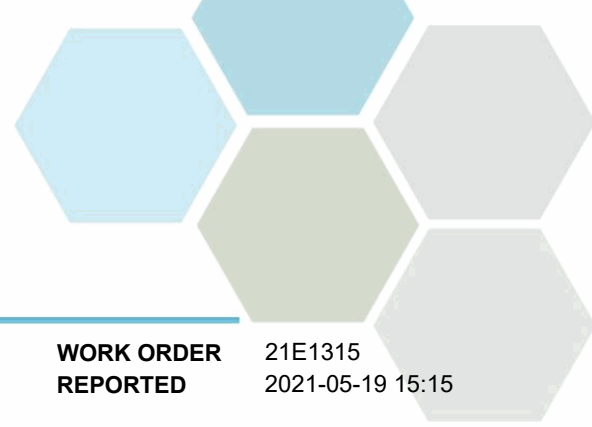
WORK ORDER REPORTED 21E1315
2021-05-19 15:15

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E1315
2021-05-19 15:15

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E2189
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-19 12:40 / 7.0°C
PO NUMBER	OK Falls WW	REPORTED	2021-05-21 10:21
PROJECT	OK Falls WWTP MORC	COC NUMBER	B099124
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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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.

Work Order Comments:

Custody Seals Intact: YES

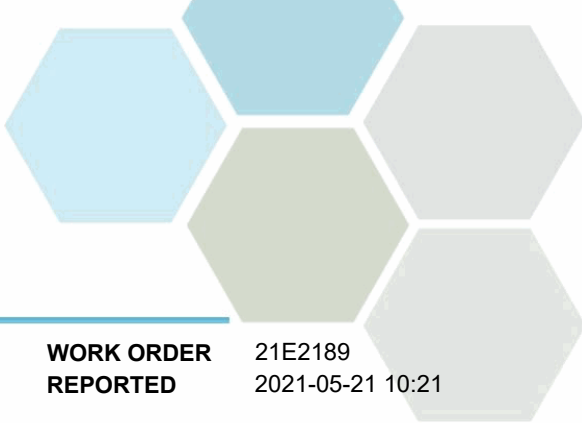
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E2189
2021-05-21 10:21

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21E2189-01) | Matrix: Water | Sampled: 2021-05-18 13:45

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	20	1	MPN/100 mL	2021-05-19	
E. coli (Q-Tray)	20	1	MPN/100 mL	2021-05-19	

Okanagan River Channel 100m Downstream - Bacteria (21E2189-02) | Matrix: Water | Sampled: 2021-05-18 13:50

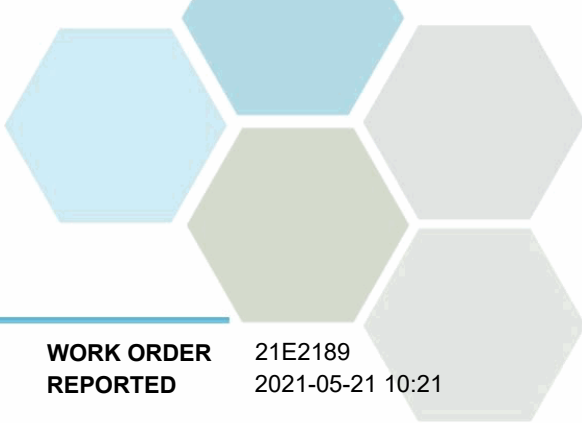
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	17	1	MPN/100 mL	2021-05-19	
E. coli (Q-Tray)	15	1	MPN/100 mL	2021-05-19	

Okanagan River Channel 500m Downstream - Bacteria (21E2189-03) | Matrix: Water | Sampled: 2021-05-18 13:55

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	19	1	MPN/100 mL	2021-05-19	
E. coli (Q-Tray)	19	1	MPN/100 mL	2021-05-19	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E2189
2021-05-21 10:21

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E3067
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-27 12:40 / 8.4°C
PO NUMBER	OK Falls WW	REPORTED	2021-05-31 11:05
PROJECT	OK Falls WWTP MORC	COC NUMBER	B099127
PROJECT INFO			

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

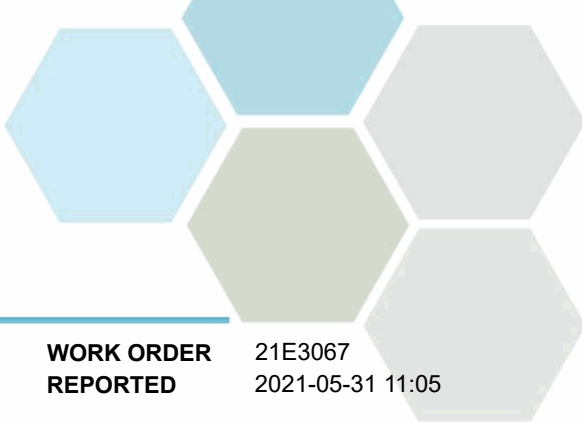
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E3067
2021-05-31 11:05

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21E3067-01) | Matrix: Water | Sampled: 2021-05-26 12:40

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	44	1	MPN/100 mL	2021-05-27	
E. coli (Q-Tray)	44	1	MPN/100 mL	2021-05-27	

Okanagan River Channel 100m Downstream - Bacteria (21E3067-02) | Matrix: Water | Sampled: 2021-05-26 12:45

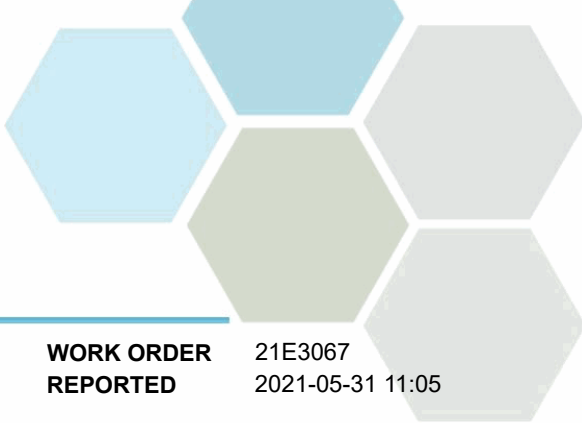
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	23	1	MPN/100 mL	2021-05-27	
E. coli (Q-Tray)	23	1	MPN/100 mL	2021-05-27	

Okanagan River Channel 500m Downstream - Bacteria (21E3067-03) | Matrix: Water | Sampled: 2021-05-26 12:50

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	32	1	MPN/100 mL	2021-05-27	
E. coli (Q-Tray)	30	1	MPN/100 mL	2021-05-27	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21E3067
2021-05-31 11:05

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F0515
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-03 09:50 / 8.3°C
PO NUMBER	OK Falls WW	COC NUMBER	2021-06-04 15:48 B099113
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

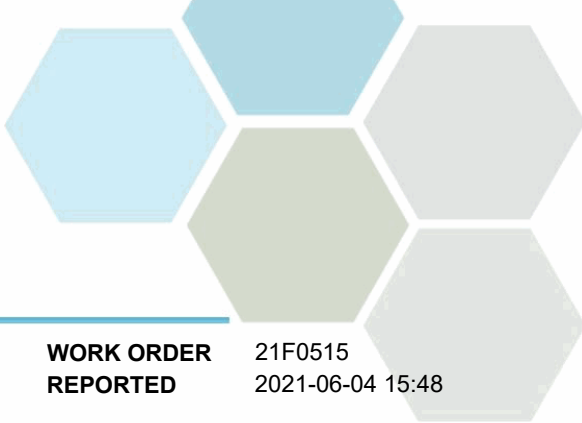
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F0515
2021-06-04 15:48

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21F0515-01) | Matrix: Water | Sampled: 2021-06-02 12:00

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	44	1	MPN/100 mL	2021-06-03	
E. coli (Q-Tray)	42	1	MPN/100 mL	2021-06-03	

Okanagan River Channel 100m Downstream - Bacteria (21F0515-02) | Matrix: Water | Sampled: 2021-06-02 12:40

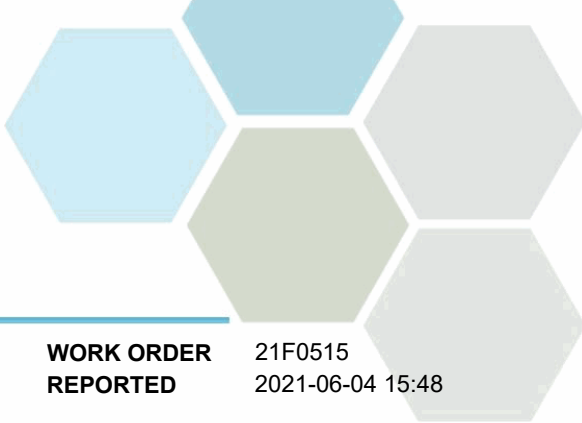
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	59	1	MPN/100 mL	2021-06-03	
E. coli (Q-Tray)	56	1	MPN/100 mL	2021-06-03	

Okanagan River Channel 500m Downstream - Bacteria (21F0515-03) | Matrix: Water | Sampled: 2021-06-02 12:45

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	31	1	MPN/100 mL	2021-06-03	
E. coli (Q-Tray)	29	1	MPN/100 mL	2021-06-03	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F0515
2021-06-04 15:48

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F1466
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-09 13:20 / 3.8°C
PO NUMBER	OK Falls WW	REPORTED	2021-06-14 14:17
PROJECT	OK Falls WWTP MORC	COC NUMBER	B099128
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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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.

Work Order Comments:

Custody Seals Intact: YES

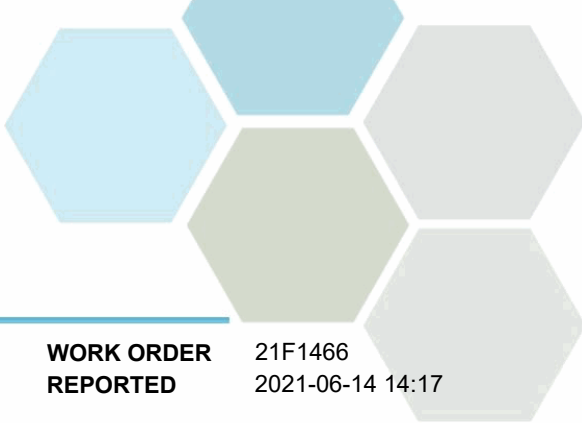
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F1466
2021-06-14 14:17

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21F1466-01) | Matrix: Water | Sampled: 2021-06-09 11:35

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	16	1	MPN/100 mL	2021-06-10	
E. coli (Q-Tray)	16	1	MPN/100 mL	2021-06-10	

Okanagan River Channel 100m Downstream - Bacteria (21F1466-02) | Matrix: Water | Sampled: 2021-06-09 11:40

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	19	1	MPN/100 mL	2021-06-10	
E. coli (Q-Tray)	15	1	MPN/100 mL	2021-06-10	

Okanagan River Channel 500m Downstream - Bacteria (21F1466-03) | Matrix: Water | Sampled: 2021-06-09 11:50

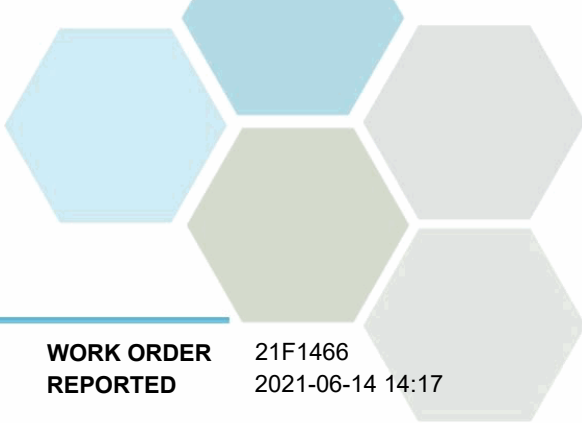
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	5	1	MPN/100 mL	2021-06-10	
E. coli (Q-Tray)	4	1	MPN/100 mL	2021-06-10	

South Ditch (21F1466-04) | Matrix: Water | Sampled: 2021-06-09 11:55

Microbiological Parameters

Coliforms, Total (Q-Tray)	1990	1	MPN/100 mL	2021-06-10	
Coliforms, Fecal (Q-Tray)	365	1	MPN/100 mL	2021-06-10	
E. coli (Q-Tray)	365	1	MPN/100 mL	2021-06-10	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F1466
2021-06-14 14:17

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F2430
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-17 12:10 / 5.4°C
PO NUMBER	OK Falls WW	COC NUMBER	B099114
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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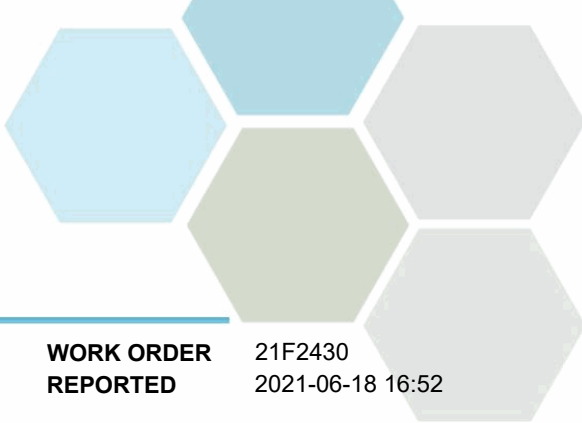
<p><i>Big Picture Sidekicks</i></p>  <p>You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.</p>	<p><i>We've Got Chemistry</i></p>  <p>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.</p>	<p><i>Ahead of the Curve</i></p>  <p>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.</p>
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Work Order Comments: Custody Seals Intact: YES

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

Authorized By:

Brent Whitehead
Client Scientist - Team Lead



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F2430
2021-06-18 16:52

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21F2430-01) | Matrix: Water | Sampled: 2021-06-16 11:20

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	29	1	MPN/100 mL	2021-06-17	
E. coli (Q-Tray)	28	1	MPN/100 mL	2021-06-17	

Okanagan River Channel 100m Downstream - Bacteria (21F2430-02) | Matrix: Water | Sampled: 2021-06-16 11:35

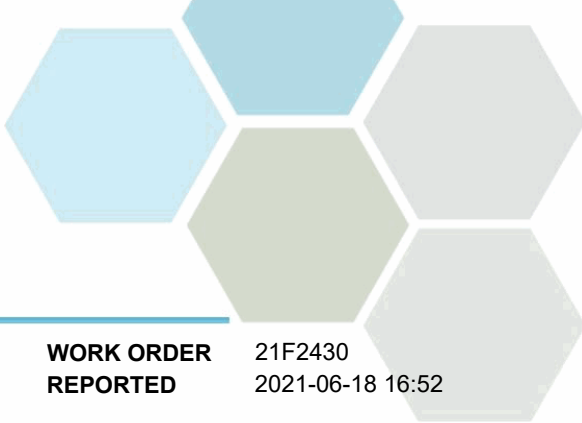
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	22	1	MPN/100 mL	2021-06-17	
E. coli (Q-Tray)	22	1	MPN/100 mL	2021-06-17	

Okanagan River Channel 500m Downstream - Bacteria (21F2430-03) | Matrix: Water | Sampled: 2021-06-16 11:50

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	14	1	MPN/100 mL	2021-06-17	
E. coli (Q-Tray)	13	1	MPN/100 mL	2021-06-17	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F2430
2021-06-18 16:52

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F2437
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-17 12:10 / 5.4°C
PO NUMBER	OK Falls WW	COC NUMBER	B099114
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

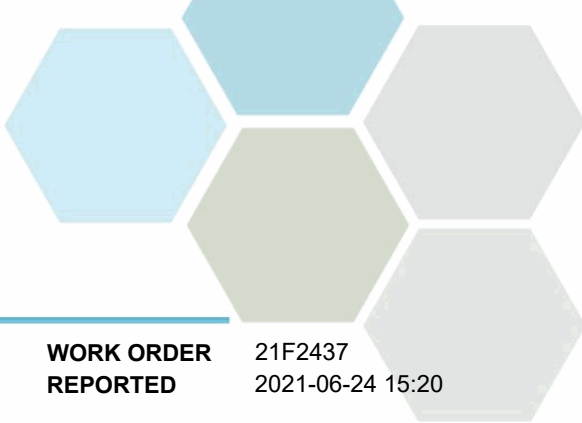
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F2437
2021-06-24 15:20

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21F2437-01) Matrix: Water Sampled: 2021-06-16 11:20					FILT, PRES

Anions

Chloride	5.43	0.10	mg/L	2021-06-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-06-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-19	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-06-19	
Sulfate	27.3	1.0	mg/L	2021-06-19	

Calculated Parameters

Hardness, Total (as CaCO3)	121	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.268	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-06-18	
Conductivity (EC)	241	2.0	µS/cm	2021-06-23	
Nitrogen, Total Kjeldahl	0.268	0.050	mg/L	2021-06-23	
pH	8.26	0.10	pH units	2021-06-23	HT2
Phosphorus, Total (as P)	0.0061	0.0050	mg/L	2021-06-23	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-06-23	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-20	

Total Metals

Calcium, total	33.2	0.20	mg/L	2021-06-23	
Magnesium, total	9.19	0.010	mg/L	2021-06-23	
Potassium, total	2.49	0.10	mg/L	2021-06-23	
Sodium, total	11.9	0.10	mg/L	2021-06-23	

Okanagan River Channel 100m Downstream (21F2437-02) | Matrix: Water | Sampled: 2021-06-16 11:35

FILT,
PRES

Anions

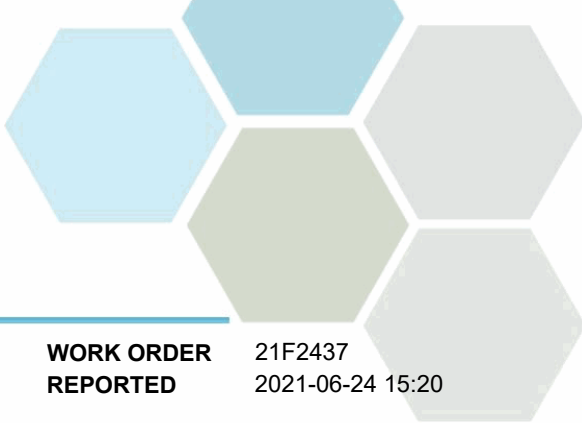
Chloride	5.53	0.10	mg/L	2021-06-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-06-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-19	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-06-19	
Sulfate	27.9	1.0	mg/L	2021-06-19	

Calculated Parameters

Hardness, Total (as CaCO3)	120	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.236	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-06-18	
Conductivity (EC)	247	2.0	µS/cm	2021-06-23	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F2437
2021-06-24 15:20

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21F2437-02) Matrix: Water Sampled: 2021-06-16 11:35, Continued					FILT, PRES

General Parameters, Continued

Nitrogen, Total Kjeldahl	0.236	0.050	mg/L	2021-06-23	
pH	8.26	0.10	pH units	2021-06-23	HT2
Phosphorus, Total (as P)	0.0057	0.0050	mg/L	2021-06-23	
Phosphorus, Total Dissolved	0.0079	0.0050	mg/L	2021-06-23	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-20	

Total Metals

Calcium, total	32.6	0.20	mg/L	2021-06-23	
Magnesium, total	9.48	0.010	mg/L	2021-06-23	
Potassium, total	2.50	0.10	mg/L	2021-06-23	
Sodium, total	12.5	0.10	mg/L	2021-06-23	

Okanagan River Channel 500m Downstream (21F2437-03) | Matrix: Water | Sampled: 2021-06-16 11:50

FILT, PRES

Anions

Chloride	5.56	0.10	mg/L	2021-06-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-06-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-19	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-06-19	
Sulfate	27.7	1.0	mg/L	2021-06-19	

Calculated Parameters

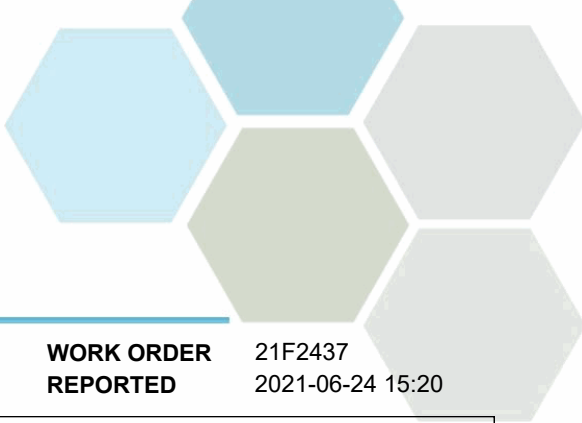
Hardness, Total (as CaCO3)	117	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.270	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-06-18	
Conductivity (EC)	< 2.0	2.0	µS/cm	2021-06-23	
Nitrogen, Total Kjeldahl	0.270	0.050	mg/L	2021-06-23	
pH	8.29	0.10	pH units	2021-06-23	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-06-23	
Phosphorus, Total Dissolved	0.0066	0.0050	mg/L	2021-06-23	
Solids, Total Suspended	2.0	2.0	mg/L	2021-06-20	

Total Metals

Calcium, total	31.4	0.20	mg/L	2021-06-23	
Magnesium, total	9.31	0.010	mg/L	2021-06-23	
Potassium, total	2.49	0.10	mg/L	2021-06-23	
Sodium, total	12.2	0.10	mg/L	2021-06-23	



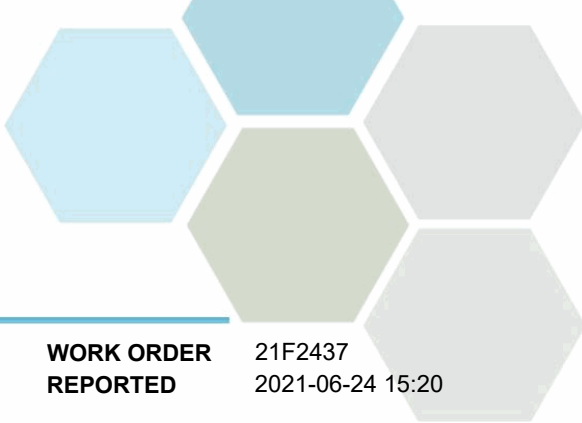
TEST RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls WWTP MORC

WORK ORDER 21F2437
REPORTED 2021-06-24 15:20

Sample Qualifiers:

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
PRES Sample has been preserved for NH3, TKN, TP, TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F2437
2021-06-24 15:20

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F3143
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-23 08:00 / 3.1°C 2021-06-25 12:26
PO NUMBER	OK Falls WW	COC NUMBER	B099116
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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Work Order Comments:

Custody Seals Intact: YES

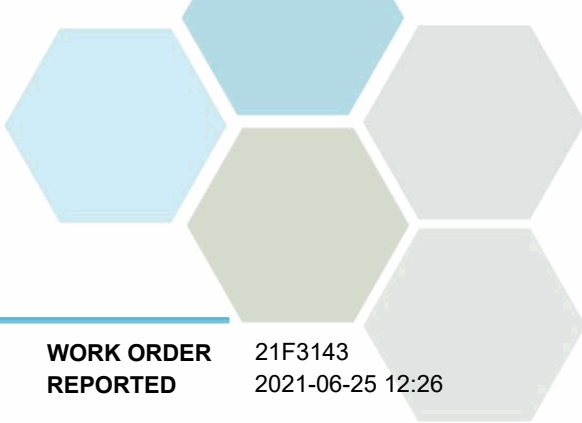
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F3143
2021-06-25 12:26

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21F3143-01) | Matrix: Water | Sampled: 2021-06-22 10:40

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	18	1	MPN/100 mL	2021-06-23	
E. coli (Q-Tray)	17	1	MPN/100 mL	2021-06-23	

Okanagan River Channel 100m Downstream - Bacteria (21F3143-02) | Matrix: Water | Sampled: 2021-06-22 10:45

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	8	1	MPN/100 mL	2021-06-23	
E. coli (Q-Tray)	8	1	MPN/100 mL	2021-06-23	

Okanagan River Channel 500m Downstream - Bacteria (21F3143-03) | Matrix: Water | Sampled: 2021-06-22 10:50

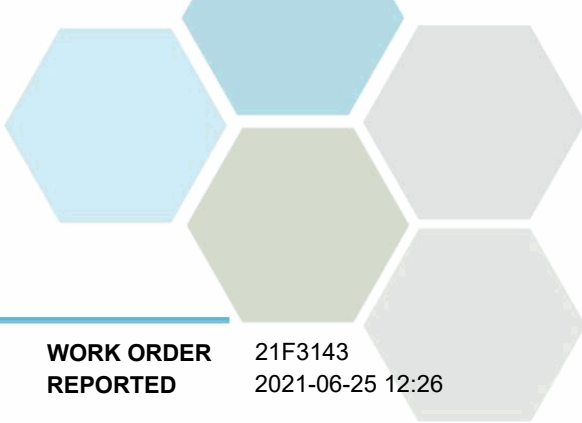
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	10	1	MPN/100 mL	2021-06-23	
E. coli (Q-Tray)	10	1	MPN/100 mL	2021-06-23	

South Ditch (21F3143-04) | Matrix: Surface Water | Sampled: 2021-06-22 10:55

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	44	1	MPN/100 mL	2021-06-23	
E. coli (Q-Tray)	35	1	MPN/100 mL	2021-06-23	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F3143
2021-06-25 12:26

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21F3794
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-06-29 12:14 / 4.1°C
PO NUMBER	OK Falls WW	COC NUMBER	B099119
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

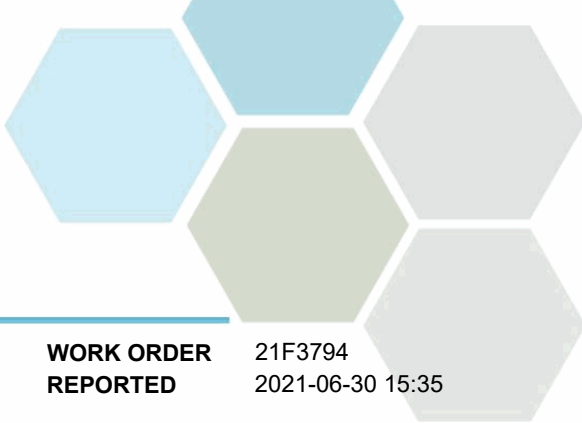
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F3794
2021-06-30 15:35

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21F3794-01) | Matrix: Water | Sampled: 2021-06-28 10:40

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	13	1	MPN/100 mL	2021-06-29	
E. coli (Q-Tray)	11	1	MPN/100 mL	2021-06-29	

Okanagan River Channel 100m Downstream - Bacteria (21F3794-02) | Matrix: Water | Sampled: 2021-06-28 10:45

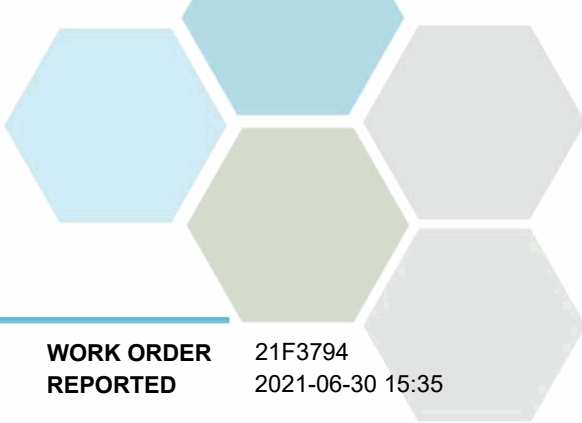
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	14	1	MPN/100 mL	2021-06-29	
E. coli (Q-Tray)	14	1	MPN/100 mL	2021-06-29	

Okanagan River Channel 500m Downstream - Bacteria (21F3794-03) | Matrix: Water | Sampled: 2021-06-28 10:50

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	18	1	MPN/100 mL	2021-06-29	
E. coli (Q-Tray)	17	1	MPN/100 mL	2021-06-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21F3794
2021-06-30 15:35

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21G0669

RECEIVED / TEMP 2021-07-07 09:50 / 9.5°C

REPORTED 2021-07-09 10:54

COC NUMBER B099112

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

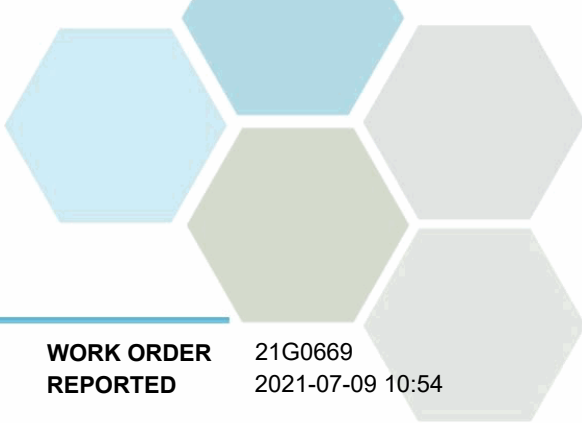
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21G0669
2021-07-09 10:54

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21G0669-01) | Matrix: Water | Sampled: 2021-07-06 11:12

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	21	1	MPN/100 mL	2021-07-07	
E. coli (Q-Tray)	8	1	MPN/100 mL	2021-07-07	

Okanagan River Channel 100m Downstream - Bacteria (21G0669-02) | Matrix: Water | Sampled: 2021-07-06 11:20

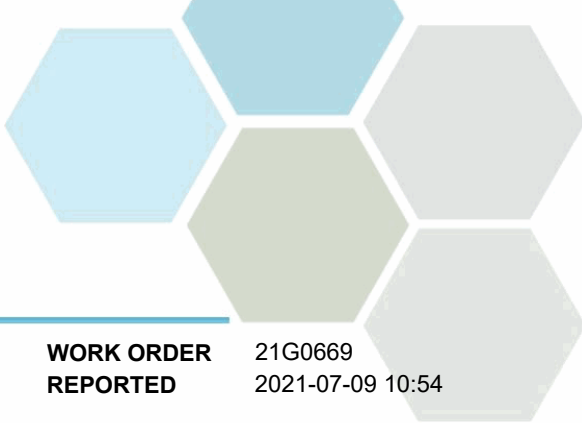
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	42	1	MPN/100 mL	2021-07-07	
E. coli (Q-Tray)	29	1	MPN/100 mL	2021-07-07	

Okanagan River Channel 500m Downstream - Bacteria (21G0669-03) | Matrix: Water | Sampled: 2021-07-06 11:26

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	22	1	MPN/100 mL	2021-07-07	
E. coli (Q-Tray)	12	1	MPN/100 mL	2021-07-07	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21G0669
2021-07-09 10:54

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
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General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G1376
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-13 12:05 / 8.6°C
PO NUMBER	OK Falls WW	REPORTED	2021-07-14 16:34
PROJECT	OK Falls WWTP MORC	COC NUMBER	No Number
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

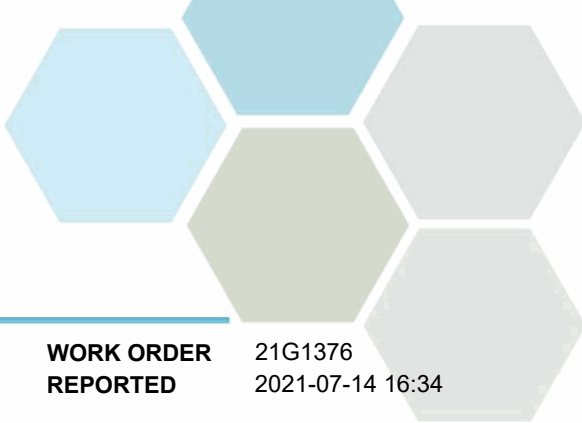
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21G1376
2021-07-14 16:34

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21G1376-01) | Matrix: Water | Sampled: 2021-07-12 11:30

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	33	1	MPN/100 mL	2021-07-13	
E. coli (Q-Tray)	29	1	MPN/100 mL	2021-07-13	

Okanagan River Channel 100m Downstream - Bacteria (21G1376-02) | Matrix: Water | Sampled: 2021-07-12 11:35

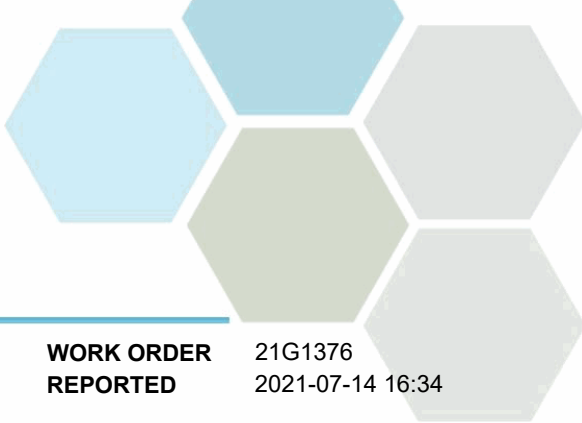
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	40	1	MPN/100 mL	2021-07-13	
E. coli (Q-Tray)	38	1	MPN/100 mL	2021-07-13	

Okanagan River Channel 500m Downstream - Bacteria (21G1376-03) | Matrix: Water | Sampled: 2021-07-12 11:35

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	19	1	MPN/100 mL	2021-07-13	
E. coli (Q-Tray)	14	1	MPN/100 mL	2021-07-13	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21G1376
2021-07-14 16:34

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QORC

PROJECT INFO

WORK ORDER 21G2736

RECEIVED / TEMP 2021-07-22 12:30 / 10.8°C

REPORTED 2021-07-23 13:34

COC NUMBER B095372

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

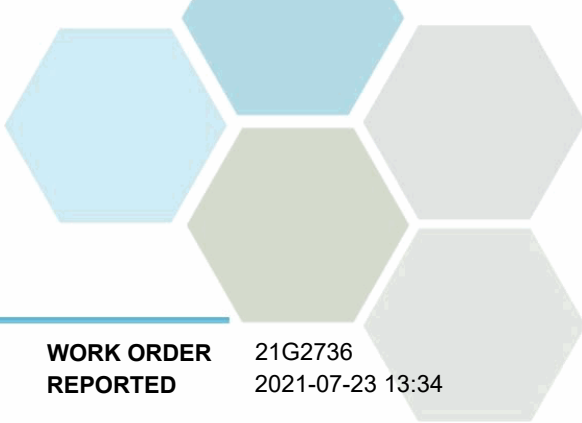
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2736
2021-07-23 13:34

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21G2736-01) | Matrix: Water | Sampled: 2021-07-21 11:25

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	15	1	MPN/100 mL	2021-07-22	
E. coli (Q-Tray)	13	1	MPN/100 mL	2021-07-22	

Okanagan River Channel 100m Downstream - Bacteria (21G2736-02) | Matrix: Water | Sampled: 2021-07-21 11:40

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	19	1	MPN/100 mL	2021-07-22	
E. coli (Q-Tray)	18	1	MPN/100 mL	2021-07-22	

Okanagan River Channel 100m Downstream Rep 1 - Bacteria (21G2736-03) | Matrix: Water | Sampled: 2021-07-21 11:40

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	11	1	MPN/100 mL	2021-07-22	
E. coli (Q-Tray)	10	1	MPN/100 mL	2021-07-22	

Okanagan River Channel 100m Downstream Rep 2 - Bacteria (21G2736-04) | Matrix: Water | Sampled: 2021-07-21 11:40

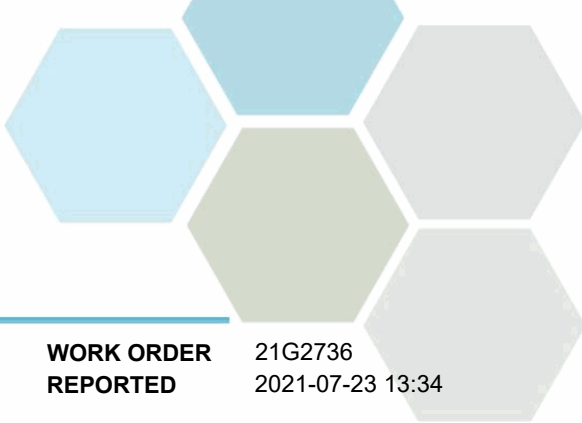
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	15	1	MPN/100 mL	2021-07-22	
E. coli (Q-Tray)	15	1	MPN/100 mL	2021-07-22	

Okanagan River Channel 500m Downstream - Bacteria (21G2736-05) | Matrix: Water | Sampled: 2021-07-21 12:10

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	16	1	MPN/100 mL	2021-07-22	
E. coli (Q-Tray)	14	1	MPN/100 mL	2021-07-22	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2736
2021-07-23 13:34

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G2737
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-22 12:30 / 10.8°C 2021-07-29 16:05
PO NUMBER	OK Falls WW	COC NUMBER	B095372
PROJECT	OK Falls WWTP QORC		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

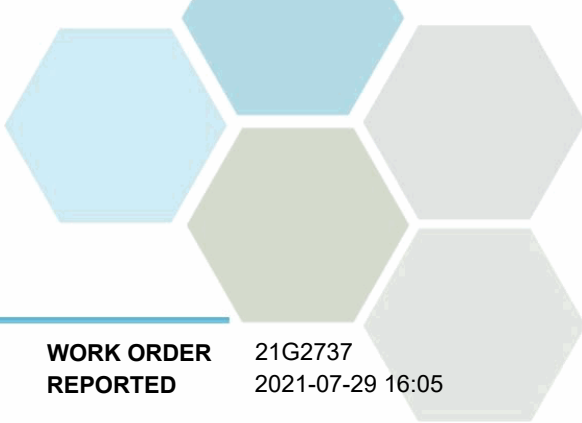
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

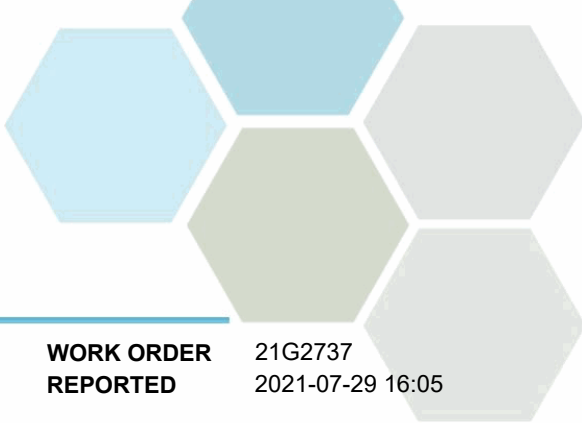


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21G2737-01) Matrix: Water Sampled: 2021-07-21					FILT, PRES
Anions					
Chloride	6.05	0.10	mg/L	2021-07-23	
Fluoride	0.14	0.10	mg/L	2021-07-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-07-23	
Sulfate	28.2	1.0	mg/L	2021-07-23	
Calculated Parameters					
Hardness, Total (as CaCO3)	118	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.188	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	119	1.0	mg/L	2021-07-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Bicarbonate (as CaCO3)	119	1.0	mg/L	2021-07-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-07-26	
BOD, 5-day	< 1.0	2.0	mg/L	2021-07-28	
Chemical Oxygen Demand	19	20	mg/L	2021-07-29	
Conductivity (EC)	265	2.0	µS/cm	2021-07-25	
Nitrogen, Total Kjeldahl	0.188	0.050	mg/L	2021-07-27	
pH	8.18	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0114	0.0050	mg/L	2021-07-27	
Phosphorus, Total Dissolved	0.0114	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-28	
Total Metals					
Aluminum, total	0.0089	0.0050	mg/L	2021-07-29	
Antimony, total	< 0.00020	0.00020	mg/L	2021-07-29	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-07-29	
Barium, total	0.0247	0.0050	mg/L	2021-07-29	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-07-29	
Boron, total	< 0.0500	0.0500	mg/L	2021-07-29	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-07-29	
Calcium, total	30.8	0.20	mg/L	2021-07-29	
Chromium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-07-29	
Copper, total	0.00080	0.00040	mg/L	2021-07-29	
Iron, total	0.013	0.010	mg/L	2021-07-29	
Lead, total	< 0.00020	0.00020	mg/L	2021-07-29	
Lithium, total	0.00357	0.00010	mg/L	2021-07-29	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21G2737-01) Matrix: Water Sampled: 2021-07-21, Continued					FILT, PRES

Total Metals, Continued

Magnesium, total	9.91	0.010	mg/L	2021-07-29	
Manganese, total	0.00525	0.00020	mg/L	2021-07-29	
Mercury, total	< 0.000010	0.000010	mg/L	2021-07-28	
Molybdenum, total	0.00332	0.00010	mg/L	2021-07-29	
Nickel, total	0.00053	0.00040	mg/L	2021-07-29	
Phosphorus, total	< 0.050	0.050	mg/L	2021-07-29	
Potassium, total	2.58	0.10	mg/L	2021-07-29	
Selenium, total	0.00060	0.00050	mg/L	2021-07-29	
Silicon, total	3.2	1.0	mg/L	2021-07-29	
Silver, total	< 0.000050	0.000050	mg/L	2021-07-29	
Sodium, total	13.3	0.10	mg/L	2021-07-29	
Strontium, total	0.288	0.0010	mg/L	2021-07-29	
Sulfur, total	11.6	3.0	mg/L	2021-07-29	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Thallium, total	< 0.000020	0.000020	mg/L	2021-07-29	
Thorium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Tin, total	< 0.00020	0.00020	mg/L	2021-07-29	
Titanium, total	< 0.0050	0.0050	mg/L	2021-07-29	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-07-29	
Uranium, total	0.00243	0.000020	mg/L	2021-07-29	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-07-29	
Zinc, total	< 0.0040	0.0040	mg/L	2021-07-29	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-07-29	

Okanagan River Channel 100m Downstream (21G2737-02) | Matrix: Water | Sampled: 2021-07-21

FILT, PRES

Anions

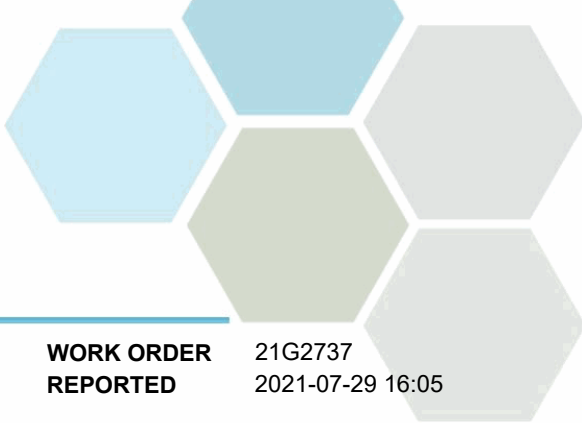
Chloride	6.05	0.10	mg/L	2021-07-23	
Fluoride	0.14	0.10	mg/L	2021-07-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-07-23	
Sulfate	28.4	1.0	mg/L	2021-07-23	

Calculated Parameters

Hardness, Total (as CaCO3)	117	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.193	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	119	1.0	mg/L	2021-07-25	
Alkalinity, Phenolphthalein (as CaCO3)	2.7	1.0	mg/L	2021-07-25	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

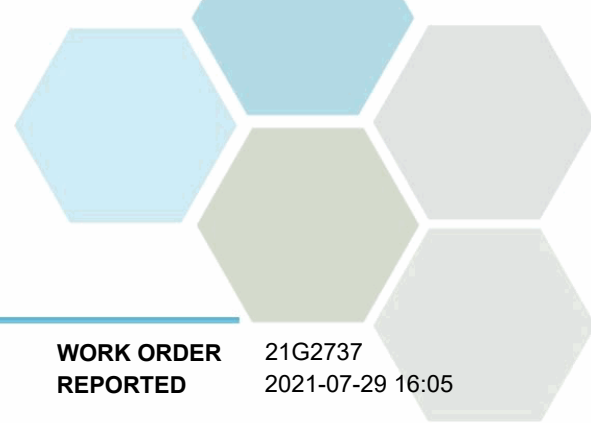
Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21G2737-02) Matrix: Water Sampled: 2021-07-21, Continued					FILT, PRES

General Parameters, Continued

Alkalinity, Bicarbonate (as CaCO3)	114	1.0	mg/L	2021-07-25	
Alkalinity, Carbonate (as CaCO3)	5.3	1.0	mg/L	2021-07-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-07-26	
BOD, 5-day	1.0	2.0	mg/L	2021-07-28	
Chemical Oxygen Demand	18	20	mg/L	2021-07-29	
Conductivity (EC)	266	2.0	µS/cm	2021-07-25	
Nitrogen, Total Kjeldahl	0.193	0.050	mg/L	2021-07-27	
pH	8.44	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0101	0.0050	mg/L	2021-07-27	
Phosphorus, Total Dissolved	0.0087	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 4.0	2.0	mg/L	2021-07-28	

Total Metals

Aluminum, total	0.0171	0.0050	mg/L	2021-07-29	
Antimony, total	< 0.00020	0.00020	mg/L	2021-07-29	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-07-29	
Barium, total	0.0235	0.0050	mg/L	2021-07-29	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-07-29	
Boron, total	< 0.0500	0.0500	mg/L	2021-07-29	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-07-29	
Calcium, total	31.1	0.20	mg/L	2021-07-29	
Chromium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-07-29	
Copper, total	0.00098	0.00040	mg/L	2021-07-29	
Iron, total	0.013	0.010	mg/L	2021-07-29	
Lead, total	< 0.00020	0.00020	mg/L	2021-07-29	
Lithium, total	0.00367	0.00010	mg/L	2021-07-29	
Magnesium, total	9.66	0.010	mg/L	2021-07-29	
Manganese, total	0.00544	0.00020	mg/L	2021-07-29	
Mercury, total	< 0.000010	0.000010	mg/L	2021-07-28	
Molybdenum, total	0.00317	0.00010	mg/L	2021-07-29	
Nickel, total	0.00045	0.00040	mg/L	2021-07-29	
Phosphorus, total	< 0.050	0.050	mg/L	2021-07-29	
Potassium, total	2.52	0.10	mg/L	2021-07-29	
Selenium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Silicon, total	3.1	1.0	mg/L	2021-07-29	
Silver, total	< 0.000050	0.000050	mg/L	2021-07-29	
Sodium, total	12.4	0.10	mg/L	2021-07-29	
Strontium, total	0.285	0.0010	mg/L	2021-07-29	
Sulfur, total	9.5	3.0	mg/L	2021-07-29	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-07-29	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21G2737-02) Matrix: Water Sampled: 2021-07-21, Continued					FILT, PRES
Total Metals, Continued					
Thallium, total	< 0.000020	0.000020	mg/L	2021-07-29	
Thorium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Tin, total	< 0.00020	0.00020	mg/L	2021-07-29	
Titanium, total	< 0.0050	0.0050	mg/L	2021-07-29	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-07-29	
Uranium, total	0.00248	0.000020	mg/L	2021-07-29	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-07-29	
Zinc, total	0.0180	0.0040	mg/L	2021-07-29	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-07-29	

Okanagan River Channel 100m Downstream Rep 1 (21G2737-03) | Matrix: Water | Sampled: 2021-07-21

FILT,
PRES

Anions

Chloride	6.19	0.10	mg/L	2021-07-23	
Fluoride	0.14	0.10	mg/L	2021-07-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-07-23	
Sulfate	28.4	1.0	mg/L	2021-07-23	

Calculated Parameters

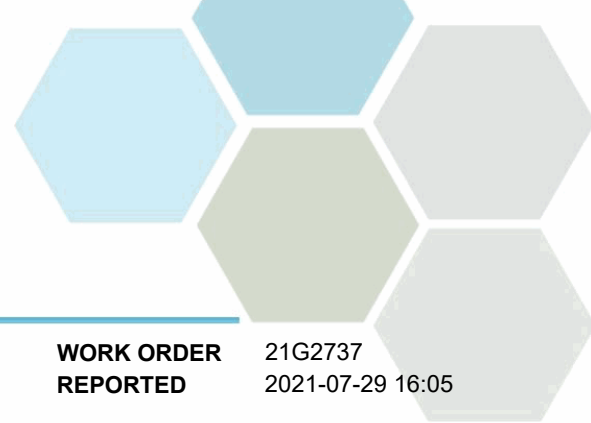
Hardness, Total (as CaCO3)	116	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.219	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	120	1.0	mg/L	2021-07-25	
Alkalinity, Phenolphthalein (as CaCO3)	3.4	1.0	mg/L	2021-07-25	
Alkalinity, Bicarbonate (as CaCO3)	113	1.0	mg/L	2021-07-25	
Alkalinity, Carbonate (as CaCO3)	6.8	1.0	mg/L	2021-07-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-07-26	
BOD, 5-day	< 1.0	2.0	mg/L	2021-07-28	
Chemical Oxygen Demand	26	20	mg/L	2021-07-29	
Conductivity (EC)	271	2.0	µS/cm	2021-07-25	
Nitrogen, Total Kjeldahl	0.219	0.050	mg/L	2021-07-27	
pH	8.46	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0112	0.0050	mg/L	2021-07-27	
Phosphorus, Total Dissolved	0.0086	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 4.0	2.0	mg/L	2021-07-27	

Total Metals

Aluminum, total	0.0089	0.0050	mg/L	2021-07-29	
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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

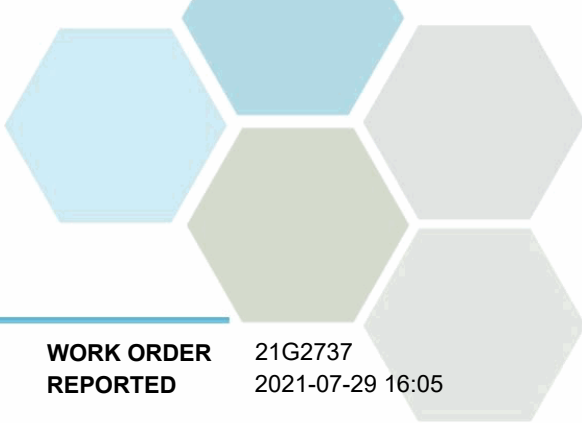
Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream Rep 1 (21G2737-03) Matrix: Water Sampled: 2021-07-21, Continued					FILT, PRES
<i>Total Metals, Continued</i>					
Antimony, total	< 0.00020	0.00020	mg/L	2021-07-29	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-07-29	
Barium, total	0.0245	0.0050	mg/L	2021-07-29	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-07-29	
Boron, total	< 0.0500	0.0500	mg/L	2021-07-29	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-07-29	
Calcium, total	30.5	0.20	mg/L	2021-07-29	
Chromium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-07-29	
Copper, total	0.00103	0.00040	mg/L	2021-07-29	
Iron, total	0.013	0.010	mg/L	2021-07-29	
Lead, total	< 0.00020	0.00020	mg/L	2021-07-29	
Lithium, total	0.00357	0.00010	mg/L	2021-07-29	
Magnesium, total	9.53	0.010	mg/L	2021-07-29	
Manganese, total	0.00514	0.00020	mg/L	2021-07-29	
Mercury, total	< 0.000010	0.000010	mg/L	2021-07-28	
Molybdenum, total	0.00323	0.00010	mg/L	2021-07-29	
Nickel, total	0.00086	0.00040	mg/L	2021-07-29	
Phosphorus, total	< 0.050	0.050	mg/L	2021-07-29	
Potassium, total	2.45	0.10	mg/L	2021-07-29	
Selenium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Silicon, total	3.1	1.0	mg/L	2021-07-29	
Silver, total	< 0.000050	0.000050	mg/L	2021-07-29	
Sodium, total	12.1	0.10	mg/L	2021-07-29	
Strontium, total	0.281	0.0010	mg/L	2021-07-29	
Sulfur, total	9.5	3.0	mg/L	2021-07-29	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Thallium, total	< 0.000020	0.000020	mg/L	2021-07-29	
Thorium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Tin, total	< 0.00020	0.00020	mg/L	2021-07-29	
Titanium, total	< 0.0050	0.0050	mg/L	2021-07-29	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-07-29	
Uranium, total	0.00242	0.000020	mg/L	2021-07-29	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-07-29	
Zinc, total	< 0.0040	0.0040	mg/L	2021-07-29	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-07-29	

Okanagan River Channel 100m Downstream Rep 2 (21G2737-04) | Matrix: Water | Sampled: 2021-07-21

FILT,
PRES

Anions

Chloride	6.31	0.10	mg/L	2021-07-23
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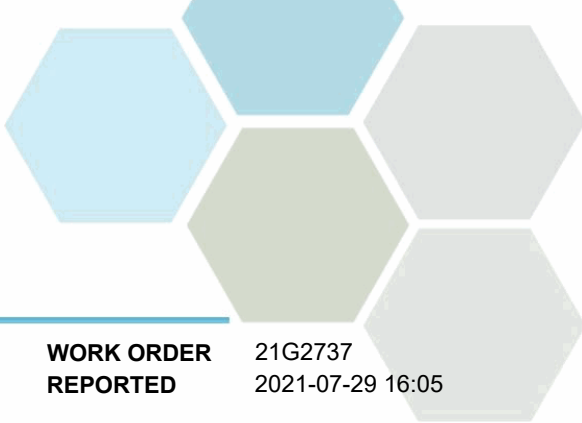


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream Rep 2 (21G2737-04) Matrix: Water Sampled: 2021-07-21, Continued					FILT, PRES
Anions, Continued					
Fluoride	0.14	0.10	mg/L	2021-07-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-07-23	
Sulfate	28.5	1.0	mg/L	2021-07-23	
Calculated Parameters					
Hardness, Total (as CaCO3)	116	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.221	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	118	1.0	mg/L	2021-07-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Alkalinity, Bicarbonate (as CaCO3)	116	1.0	mg/L	2021-07-25	
Alkalinity, Carbonate (as CaCO3)	1.9	1.0	mg/L	2021-07-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-07-26	
BOD, 5-day	1.1	2.0	mg/L	2021-07-28	
Chemical Oxygen Demand	22	20	mg/L	2021-07-29	
Conductivity (EC)	267	2.0	µS/cm	2021-07-25	
Nitrogen, Total Kjeldahl	0.221	0.050	mg/L	2021-07-27	
pH	8.36	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0107	0.0050	mg/L	2021-07-27	
Phosphorus, Total Dissolved	0.0100	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 4.0	2.0	mg/L	2021-07-27	
Total Metals					
Aluminum, total	0.0069	0.0050	mg/L	2021-07-29	
Antimony, total	< 0.00020	0.00020	mg/L	2021-07-29	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-07-29	
Barium, total	0.0235	0.0050	mg/L	2021-07-29	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-07-29	
Boron, total	< 0.0500	0.0500	mg/L	2021-07-29	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-07-29	
Calcium, total	30.3	0.20	mg/L	2021-07-29	
Chromium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-07-29	
Copper, total	0.00072	0.00040	mg/L	2021-07-29	
Iron, total	0.013	0.010	mg/L	2021-07-29	
Lead, total	< 0.00020	0.00020	mg/L	2021-07-29	
Lithium, total	0.00355	0.00010	mg/L	2021-07-29	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream Rep 2 (21G2737-04) Matrix: Water Sampled: 2021-07-21, Continued					FILT, PRES

Total Metals, Continued

Magnesium, total	9.67	0.010	mg/L	2021-07-29	
Manganese, total	0.00533	0.00020	mg/L	2021-07-29	
Mercury, total	< 0.000010	0.000010	mg/L	2021-07-28	
Molybdenum, total	0.00333	0.00010	mg/L	2021-07-29	
Nickel, total	0.00062	0.00040	mg/L	2021-07-29	
Phosphorus, total	< 0.050	0.050	mg/L	2021-07-29	
Potassium, total	2.47	0.10	mg/L	2021-07-29	
Selenium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Silicon, total	3.0	1.0	mg/L	2021-07-29	
Silver, total	< 0.000050	0.000050	mg/L	2021-07-29	
Sodium, total	12.4	0.10	mg/L	2021-07-29	
Strontium, total	0.282	0.0010	mg/L	2021-07-29	
Sulfur, total	9.9	3.0	mg/L	2021-07-29	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Thallium, total	< 0.000020	0.000020	mg/L	2021-07-29	
Thorium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Tin, total	< 0.00020	0.00020	mg/L	2021-07-29	
Titanium, total	< 0.0050	0.0050	mg/L	2021-07-29	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-07-29	
Uranium, total	0.00243	0.000020	mg/L	2021-07-29	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-07-29	
Zinc, total	< 0.0040	0.0040	mg/L	2021-07-29	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-07-29	

Okanagan River Channel 500m Downstream (21G2737-05) | Matrix: Water | Sampled: 2021-07-21

FILT, PRES

Anions

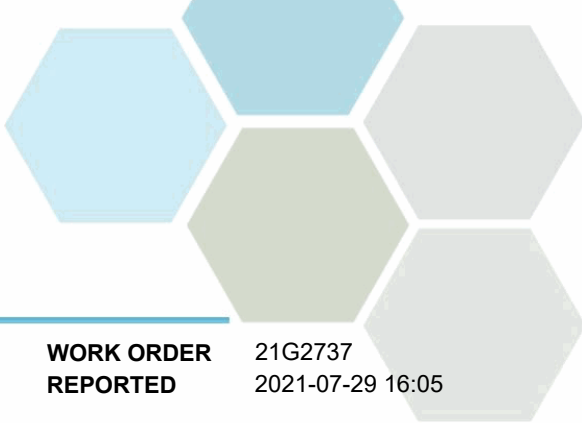
Chloride	6.22	0.10	mg/L	2021-07-23	
Fluoride	0.14	0.10	mg/L	2021-07-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-07-23	
Sulfate	28.3	1.0	mg/L	2021-07-23	

Calculated Parameters

Hardness, Total (as CaCO3)	118	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.192	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	119	1.0	mg/L	2021-07-25	
Alkalinity, Phenolphthalein (as CaCO3)	1.6	1.0	mg/L	2021-07-25	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

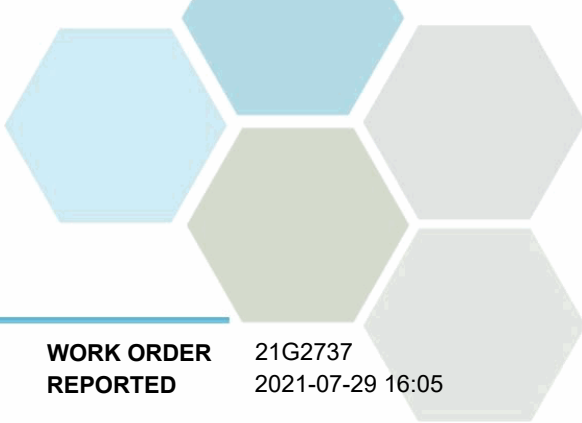
Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 500m Downstream (21G2737-05) Matrix: Water Sampled: 2021-07-21, Continued					FILT, PRES

General Parameters, Continued

Alkalinity, Bicarbonate (as CaCO3)	116	1.0	mg/L	2021-07-25	
Alkalinity, Carbonate (as CaCO3)	3.2	1.0	mg/L	2021-07-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-25	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-07-26	
BOD, 5-day	< 1.0	2.0	mg/L	2021-07-28	
Chemical Oxygen Demand	23	20	mg/L	2021-07-29	
Conductivity (EC)	270	2.0	µS/cm	2021-07-25	
Nitrogen, Total Kjeldahl	0.192	0.050	mg/L	2021-07-28	
pH	8.38	0.10	pH units	2021-07-25	HT2
Phosphorus, Total (as P)	0.0109	0.0050	mg/L	2021-07-27	
Phosphorus, Total Dissolved	0.0109	0.0050	mg/L	2021-07-27	
Solids, Total Suspended	< 4.0	2.0	mg/L	2021-07-27	

Total Metals

Aluminum, total	0.0088	0.0050	mg/L	2021-07-29	
Antimony, total	< 0.00020	0.00020	mg/L	2021-07-29	
Arsenic, total	0.00053	0.00050	mg/L	2021-07-29	
Barium, total	0.0236	0.0050	mg/L	2021-07-29	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-07-29	
Boron, total	< 0.0500	0.0500	mg/L	2021-07-29	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-07-29	
Calcium, total	31.0	0.20	mg/L	2021-07-29	
Chromium, total	< 0.00050	0.00050	mg/L	2021-07-29	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-07-29	
Copper, total	0.00086	0.00040	mg/L	2021-07-29	
Iron, total	0.015	0.010	mg/L	2021-07-29	
Lead, total	< 0.00020	0.00020	mg/L	2021-07-29	
Lithium, total	0.00360	0.00010	mg/L	2021-07-29	
Magnesium, total	9.83	0.010	mg/L	2021-07-29	
Manganese, total	0.00602	0.00020	mg/L	2021-07-29	
Mercury, total	< 0.000010	0.000010	mg/L	2021-07-28	
Molybdenum, total	0.00317	0.00010	mg/L	2021-07-29	
Nickel, total	0.00045	0.00040	mg/L	2021-07-29	
Phosphorus, total	< 0.050	0.050	mg/L	2021-07-29	
Potassium, total	2.55	0.10	mg/L	2021-07-29	
Selenium, total	0.00056	0.00050	mg/L	2021-07-29	
Silicon, total	3.2	1.0	mg/L	2021-07-29	
Silver, total	< 0.000050	0.000050	mg/L	2021-07-29	
Sodium, total	12.8	0.10	mg/L	2021-07-29	
Strontium, total	0.289	0.0010	mg/L	2021-07-29	
Sulfur, total	9.0	3.0	mg/L	2021-07-29	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-07-29	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

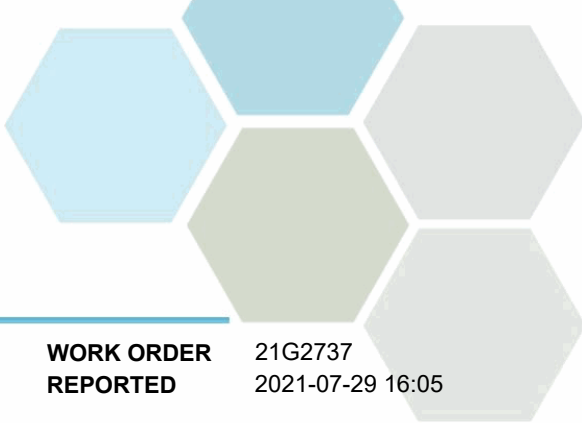
Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 500m Downstream (21G2737-05) Matrix: Water Sampled: 2021-07-21, Continued					FILT, PRES
<i>Total Metals, Continued</i>					
Thallium, total	< 0.000020	0.000020	mg/L	2021-07-29	
Thorium, total	< 0.00010	0.00010	mg/L	2021-07-29	
Tin, total	< 0.00020	0.00020	mg/L	2021-07-29	
Titanium, total	< 0.0050	0.0050	mg/L	2021-07-29	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-07-29	
Uranium, total	0.00250	0.000020	mg/L	2021-07-29	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-07-29	
Zinc, total	< 0.0040	0.0040	mg/L	2021-07-29	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-07-29	

Sample Qualifiers:

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

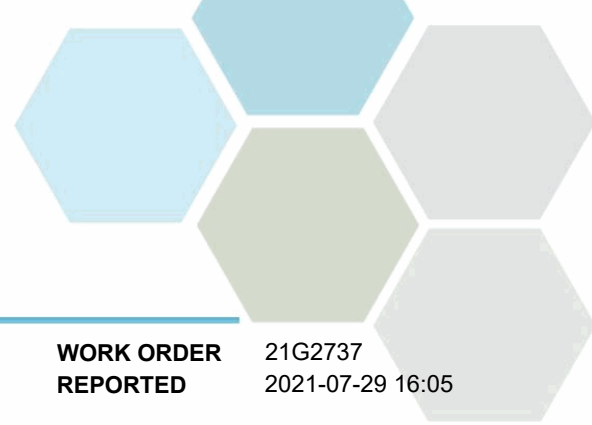
WORK ORDER REPORTED 21G2737
2021-07-29 16:05

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21G2737
2021-07-29 16:05

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. The quality control (QC) data is available upon request

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.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G3479
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-28 08:00 / 4.8°C 2021-07-30 13:12
PO NUMBER	OK Falls WW	COC NUMBER	B095374
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

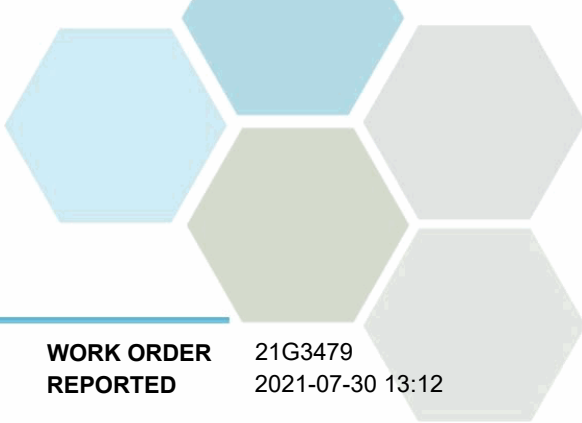
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21G3479
2021-07-30 13:12

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21G3479-01) | Matrix: Water | Sampled: 2021-07-27 10:45

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	30	1	MPN/100 mL	2021-07-28	
E. coli (Q-Tray)	17	1	MPN/100 mL	2021-07-28	

Okanagan River Channel 100m Downstream - Bacteria (21G3479-02) | Matrix: Water | Sampled: 2021-07-27 10:50

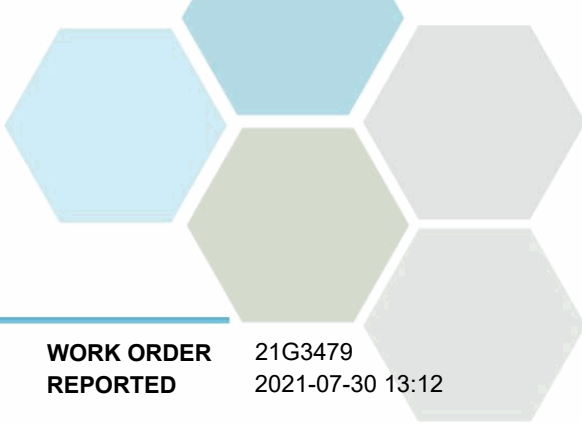
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	23	1	MPN/100 mL	2021-07-28	
E. coli (Q-Tray)	23	1	MPN/100 mL	2021-07-28	

Okanagan River Channel 500m Downstream - Bacteria (21G3479-03) | Matrix: Water | Sampled: 2021-07-27 11:55

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	26	1	MPN/100 mL	2021-07-28	
E. coli (Q-Tray)	20	1	MPN/100 mL	2021-07-28	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21G3479
2021-07-30 13:12

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H0507
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-05 13:57 / 8.9°C 2021-08-06 15:58
PO NUMBER	OK Falls WW	COC NUMBER	B095375
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

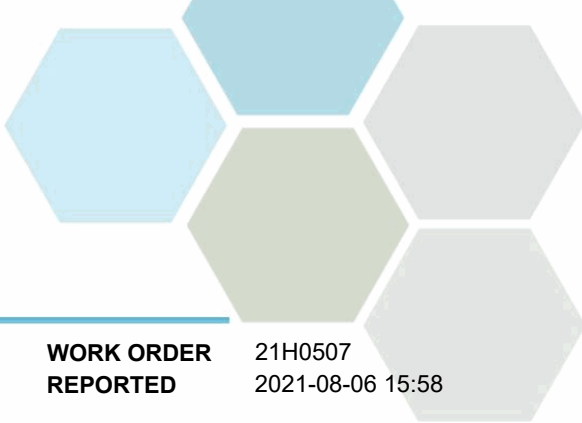
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H0507
2021-08-06 15:58

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21H0507-01) | Matrix: Water | Sampled: 2021-08-04 10:55

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	12	1	MPN/100 mL	2021-08-05	
E. coli (Q-Tray)	9	1	MPN/100 mL	2021-08-05	

Okanagan River Channel 100m Downstream - Bacteria (21H0507-02) | Matrix: Water | Sampled: 2021-08-04 11:00

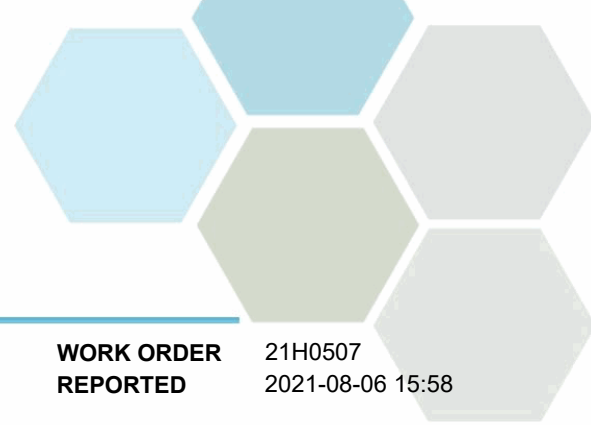
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	22	1	MPN/100 mL	2021-08-05	
E. coli (Q-Tray)	20	1	MPN/100 mL	2021-08-05	

Okanagan River Channel 500m Downstream - Bacteria (21H0507-03) | Matrix: Water | Sampled: 2021-08-04 11:07

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	21	1	MPN/100 mL	2021-08-05	
E. coli (Q-Tray)	18	1	MPN/100 mL	2021-08-05	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H0507
2021-08-06 15:58

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H1179
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-11 13:00 / 10.0°C 2021-08-12 15:09
PO NUMBER	OK Falls WW	COC NUMBER	B095376
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

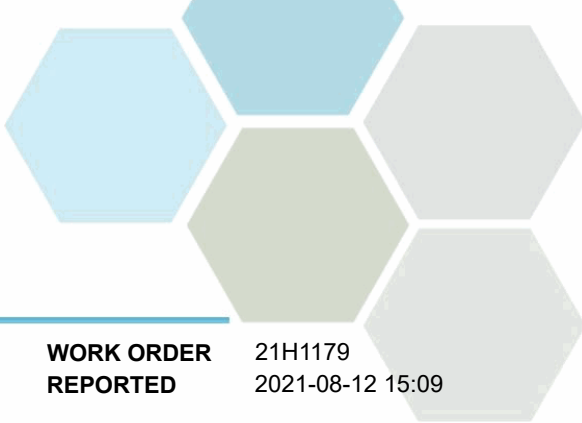
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H1179
2021-08-12 15:09

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21H1179-01) | Matrix: Water | Sampled: 2021-08-10 10:00

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	34	1	MPN/100 mL	2021-08-11	
E. coli (Q-Tray)	33	1	MPN/100 mL	2021-08-11	

Okanagan River Channel 100m Downstream - Bacteria (21H1179-02) | Matrix: Water | Sampled: 2021-08-10 10:10

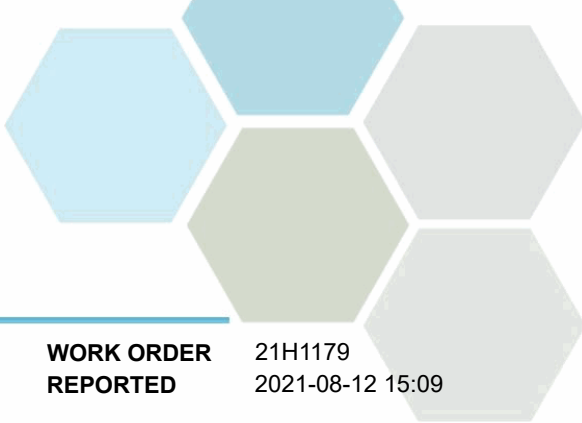
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	17	1	MPN/100 mL	2021-08-11	
E. coli (Q-Tray)	15	1	MPN/100 mL	2021-08-11	

Okanagan River Channel 500m Downstream - Bacteria (21H1179-03) | Matrix: Water | Sampled: 2021-08-10 10:30

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	25	1	MPN/100 mL	2021-08-11	
E. coli (Q-Tray)	23	1	MPN/100 mL	2021-08-11	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H1179
2021-08-12 15:09

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H1185
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-11 13:00 / 10.0°C 2021-08-17 11:38
PO NUMBER	OK Falls WW	COC NUMBER	B095376
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

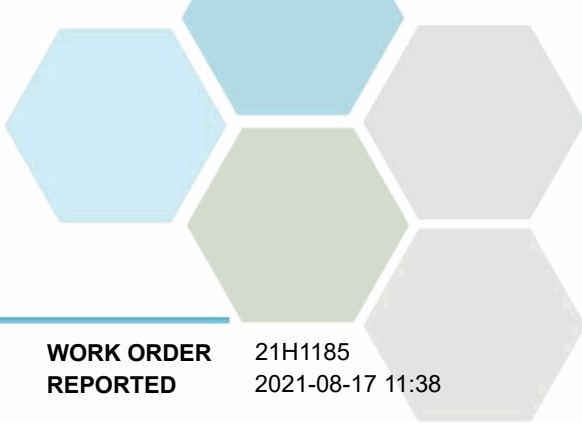
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H1185
2021-08-17 11:38

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21H1185-01) Matrix: Water Sampled: 2021-08-10 10:00					FILT, PRES ^b

Anions

Chloride	5.57	0.10	mg/L	2021-08-12	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-08-12	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-08-12	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-08-12	
Sulfate	29.8	1.0	mg/L	2021-08-12	

Calculated Parameters

Hardness, Total (as CaCO3)	117	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.257	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-08-12	
Conductivity (EC)	262	2.0	µS/cm	2021-08-12	
Nitrogen, Total Kjeldahl	0.257	0.050	mg/L	2021-08-17	
pH	8.35	0.10	pH units	2021-08-12	HT2
Phosphorus, Total (as P)	0.0072	0.0050	mg/L	2021-08-16	
Phosphorus, Total Dissolved	0.0054	0.0050	mg/L	2021-08-16	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-08-16	

Total Metals

Calcium, total	30.9	0.20	mg/L	2021-08-14	
Magnesium, total	9.55	0.010	mg/L	2021-08-14	
Potassium, total	2.44	0.10	mg/L	2021-08-14	
Sodium, total	12.5	0.10	mg/L	2021-08-14	

Okanagan River Channel 100m Downstream (21H1185-02) | Matrix: Water | Sampled: 2021-08-10 10:10

FILT,
PRES

Anions

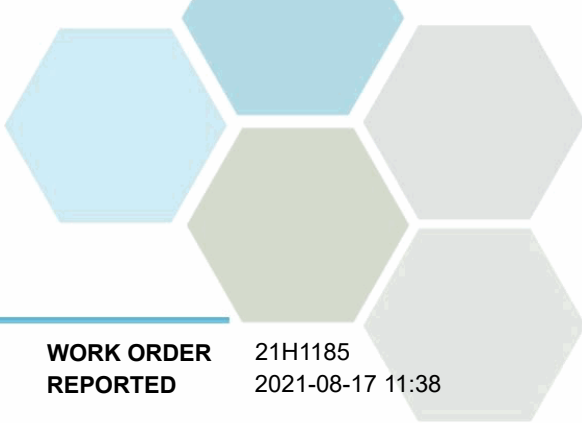
Chloride	5.48	0.10	mg/L	2021-08-12	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-08-12	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-08-12	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-08-12	
Sulfate	28.2	1.0	mg/L	2021-08-12	

Calculated Parameters

Hardness, Total (as CaCO3)	114	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.205	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-08-12	
Conductivity (EC)	261	2.0	µS/cm	2021-08-12	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H1185
2021-08-17 11:38

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21H1185-02) Matrix: Water Sampled: 2021-08-10 10:10, Continued					FILT, PRES

General Parameters, Continued

Nitrogen, Total Kjeldahl	0.205	0.050	mg/L	2021-08-17	
pH	8.36	0.10	pH units	2021-08-12	HT2
Phosphorus, Total (as P)	0.0071	0.0050	mg/L	2021-08-16	
Phosphorus, Total Dissolved	0.0060	0.0050	mg/L	2021-08-16	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-08-16	

Total Metals

Calcium, total	30.1	0.20	mg/L	2021-08-14	
Magnesium, total	9.51	0.010	mg/L	2021-08-14	
Potassium, total	2.42	0.10	mg/L	2021-08-14	
Sodium, total	12.3	0.10	mg/L	2021-08-14	

Okanagan River Channel 500m Downstream (21H1185-03) | Matrix: Water | Sampled: 2021-08-10 10:30

FILT, PRESa

Anions

Chloride	5.69	0.10	mg/L	2021-08-13	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-08-13	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-08-13	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-08-13	
Sulfate	29.0	1.0	mg/L	2021-08-13	

Calculated Parameters

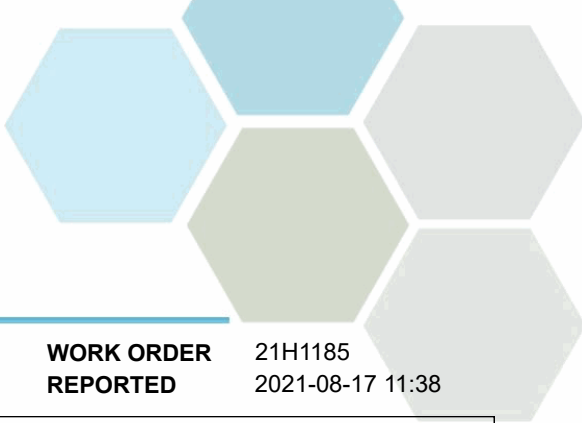
Hardness, Total (as CaCO3)	116	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.229	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-08-12	
Conductivity (EC)	264	2.0	µS/cm	2021-08-12	
Nitrogen, Total Kjeldahl	0.229	0.050	mg/L	2021-08-17	
pH	8.41	0.10	pH units	2021-08-12	HT2
Phosphorus, Total (as P)	0.0069	0.0050	mg/L	2021-08-16	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-08-16	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-08-16	

Total Metals

Calcium, total	30.6	0.20	mg/L	2021-08-14	
Magnesium, total	9.57	0.010	mg/L	2021-08-14	
Potassium, total	2.44	0.10	mg/L	2021-08-14	
Sodium, total	12.7	0.10	mg/L	2021-08-14	



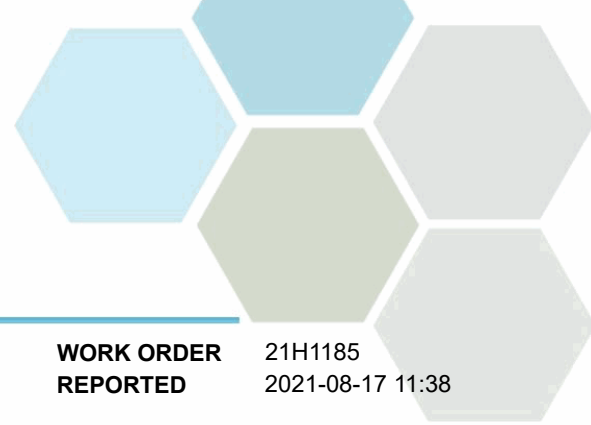
TEST RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls WWTP MORC

WORK ORDER 21H1185
REPORTED 2021-08-17 11:38

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP, TKN, NH3, TP in the laboratory and the holding time has been extended.
- PRESa Sample has been preserved for TKN, NH3, TDP, TP in the laboratory and the holding time has been extended.
- PRESb Sample has been preserved for TKN, TP, NH3, TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H1185
2021-08-17 11:38

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO ₃ +HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H2292
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-19 13:30 / 5.0°C 2021-08-20 14:38
PO NUMBER	OK Falls WW	COC NUMBER	B095377
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

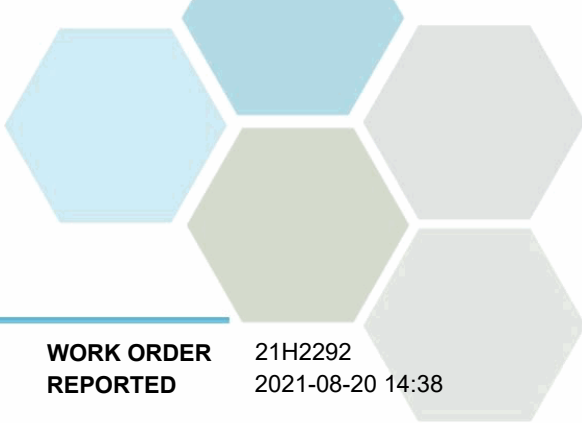
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H2292
2021-08-20 14:38

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21H2292-01) | Matrix: Water | Sampled: 2021-08-18 12:02

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	11	1	MPN/100 mL	2021-08-19	
E. coli (Q-Tray)	10	1	MPN/100 mL	2021-08-19	

Okanagan River Channel 100m Downstream - Bacteria (21H2292-02) | Matrix: Water | Sampled: 2021-08-18 12:02

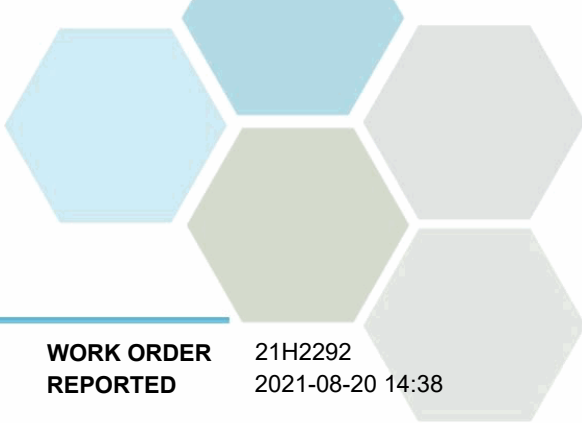
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	12	1	MPN/100 mL	2021-08-19	
E. coli (Q-Tray)	11	1	MPN/100 mL	2021-08-19	

Okanagan River Channel 500m Downstream - Bacteria (21H2292-03) | Matrix: Water | Sampled: 2021-08-18 12:02

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	12	1	MPN/100 mL	2021-08-19	
E. coli (Q-Tray)	12	1	MPN/100 mL	2021-08-19	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H2292
2021-08-20 14:38

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H3419
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-27 15:05 / 12.6°C
PO NUMBER	OK Falls WW	COC NUMBER	2021-08-31 08:10 B095855
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

This is a revised report; please refer to Appendix 3 for details.

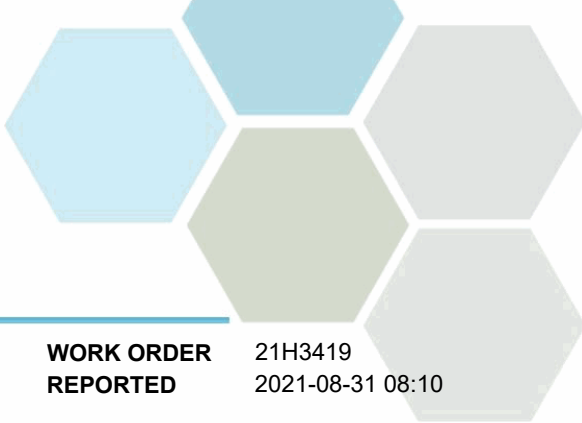
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H3419
2021-08-31 08:10

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21H3419-01) | Matrix: Water | Sampled: 2021-08-27 12:21

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	49	1	MPN/100 mL	2021-08-27	
E. coli (Q-Tray)	31	1	MPN/100 mL	2021-08-27	

Okanagan River Channel 100m Downstream - Bacteria (21H3419-02) | Matrix: Water | Sampled: 2021-08-27 12:37

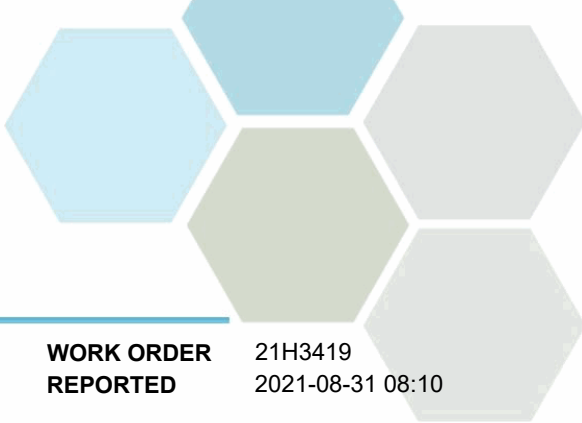
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	25	1	MPN/100 mL	2021-08-27	
E. coli (Q-Tray)	14	1	MPN/100 mL	2021-08-27	

Okanagan River Channel 500m Downstream - Bacteria (21H3419-03) | Matrix: Water | Sampled: 2021-08-27 12:33

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	31	1	MPN/100 mL	2021-08-27	
E. coli (Q-Tray)	25	1	MPN/100 mL	2021-08-27	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21H3419
2021-08-31 08:10

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

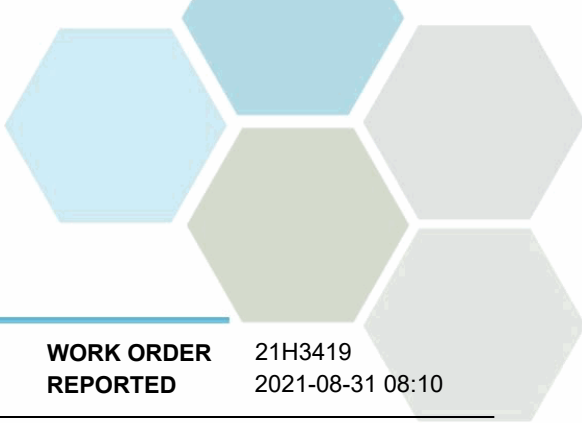
Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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APPENDIX 3: REVISION HISTORY

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls WWTP MORC			WORK ORDER REPORTED	21H3419 2021-08-31 08:10
Sample ID	Changed	Change	Analysis	Analyte(s)	
21H3419-01	2021-08-31	Date Sampled	N/A	N/A	



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2110166
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-01 14:00 / 12.1°C 2021-09-02 16:21
PO NUMBER	OK Falls WW	COC NUMBER	B095379
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: YES

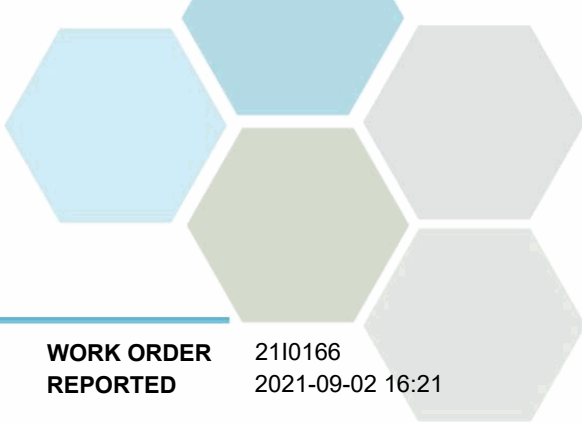
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2110166
2021-09-02 16:21

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (2110166-01) | Matrix: Water | Sampled: 2021-08-31 10:31

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	22	1	MPN/100 mL	2021-09-01	
E. coli (Q-Tray)	19	1	MPN/100 mL	2021-09-01	

Okanagan River Channel 100m Downstream - Bacteria (2110166-02) | Matrix: Water | Sampled: 2021-08-31 10:40

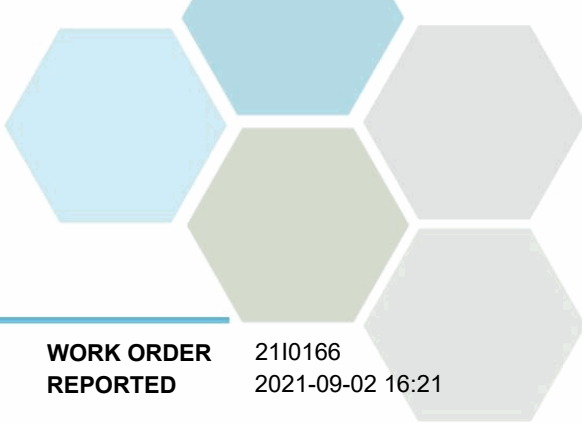
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	15	1	MPN/100 mL	2021-09-01	
E. coli (Q-Tray)	6	1	MPN/100 mL	2021-09-01	

Okanagan River Channel 500m Downstream - Bacteria (2110166-03) | Matrix: Water | Sampled: 2021-08-31 10:45

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	12	1	MPN/100 mL	2021-09-01	
E. coli (Q-Tray)	12	1	MPN/100 mL	2021-09-01	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2110166
2021-09-02 16:21

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2110997
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-08 12:35 / 7.3°C 2021-09-10 16:49
PO NUMBER	OK Falls WW	COC NUMBER	B095380
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

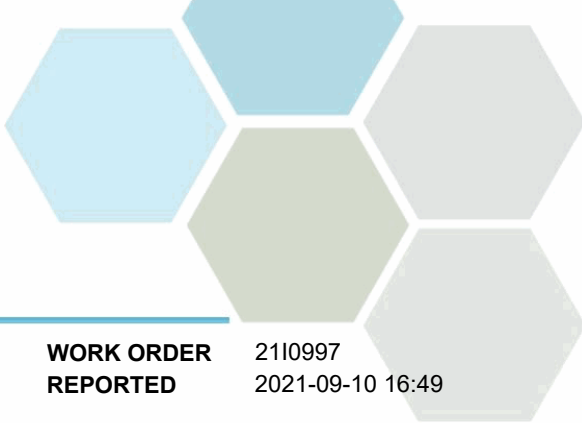
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2110997
2021-09-10 16:49

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (2110997-01) | Matrix: Water | Sampled: 2021-09-07 11:10

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	6	1	MPN/100 mL	2021-09-08	
E. coli (Q-Tray)	6	1	MPN/100 mL	2021-09-08	

Okanagan River Channel 100m Downstream - Bacteria (2110997-02) | Matrix: Water | Sampled: 2021-09-07 11:15

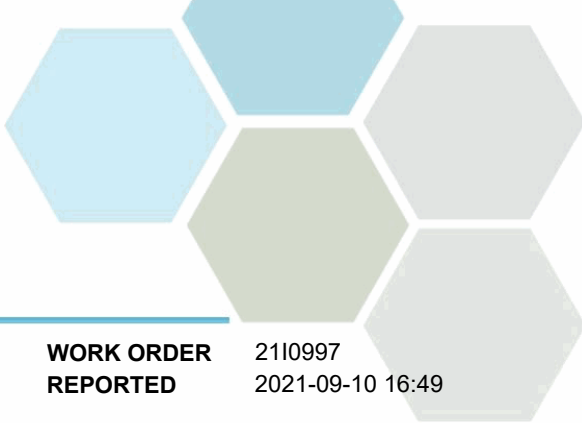
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	7	1	MPN/100 mL	2021-09-08	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-09-08	

Okanagan River Channel 500m Downstream - Bacteria (2110997-03) | Matrix: Water | Sampled: 2021-09-07 11:25

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	11	1	MPN/100 mL	2021-09-08	
E. coli (Q-Tray)	4	1	MPN/100 mL	2021-09-08	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2110997
2021-09-10 16:49

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2111687
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-14 11:55 / 7.8°C
PO NUMBER	OK Falls WW	COC NUMBER	B095381
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

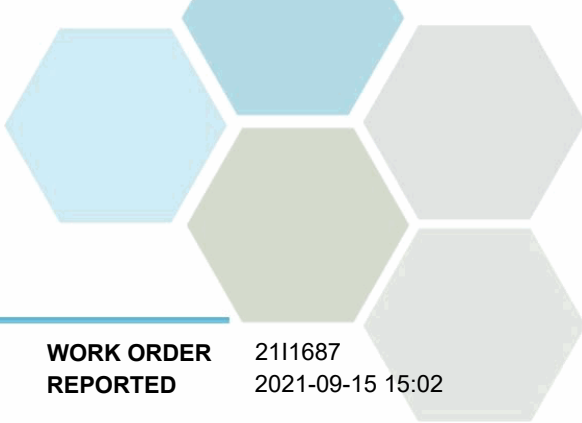
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2111687
2021-09-15 15:02

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (2111687-01) | Matrix: Water | Sampled: 2021-09-13 10:50

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	11	1	MPN/100 mL	2021-09-14	
E. coli (Q-Tray)	5	1	MPN/100 mL	2021-09-14	

Okanagan River Channel 100m Downstream - Bacteria (2111687-02) | Matrix: Water | Sampled: 2021-09-13 10:55

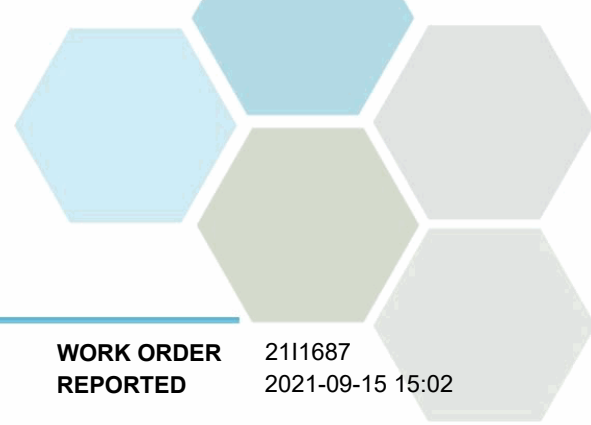
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	6	1	MPN/100 mL	2021-09-14	
E. coli (Q-Tray)	4	1	MPN/100 mL	2021-09-14	

Okanagan River Channel 500m Downstream - Bacteria (2111687-03) | Matrix: Water | Sampled: 2021-09-13 11:00

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	20	1	MPN/100 mL	2021-09-14	
E. coli (Q-Tray)	15	1	MPN/100 mL	2021-09-14	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2111687
2021-09-15 15:02

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2112983
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-22 12:30 / 8.6°C 2021-09-24 14:46
PO NUMBER	OK Falls WW	COC NUMBER	B095385
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

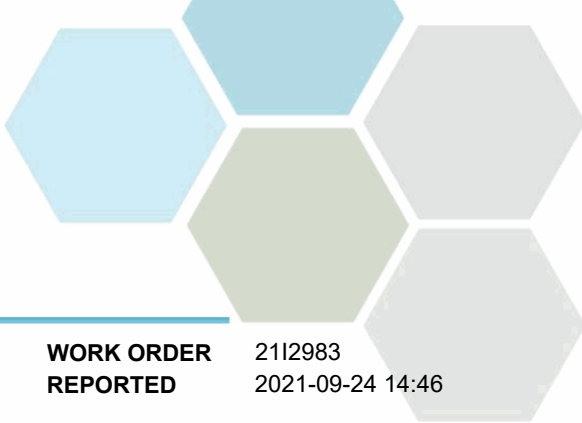
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2112983
2021-09-24 14:46

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21I2983-01) | Matrix: Water | Sampled: 2021-09-21 13:42

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	13	1	MPN/100 mL	2021-09-22	
E. coli (Q-Tray)	10	1	MPN/100 mL	2021-09-22	

Okanagan River Channel 100m Downstream - Bacteria (21I2983-02) | Matrix: Water | Sampled: 2021-09-21 14:00

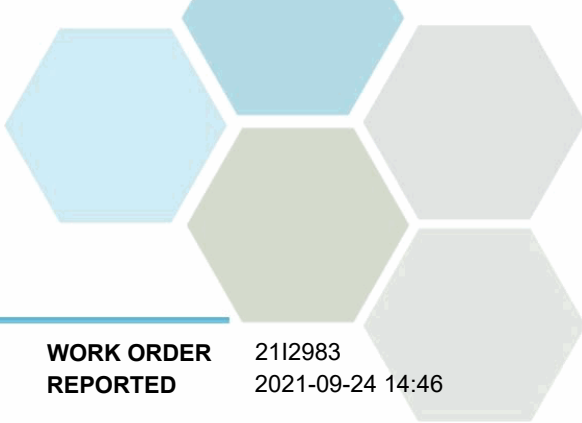
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	16	1	MPN/100 mL	2021-09-22	
E. coli (Q-Tray)	11	1	MPN/100 mL	2021-09-22	

Okanagan River Channel 500m Downstream - Bacteria (21I2983-03) | Matrix: Water | Sampled: 2021-09-21 14:10

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	7	1	MPN/100 mL	2021-09-22	
E. coli (Q-Tray)	4	1	MPN/100 mL	2021-09-22	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2112983
2021-09-24 14:46

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2112987
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-22 12:30 / 8.6°C
PO NUMBER	OK Falls WW	REPORTED	2021-09-30 12:03
PROJECT	OK Falls WWTP MORC	COC NUMBER	b095385
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

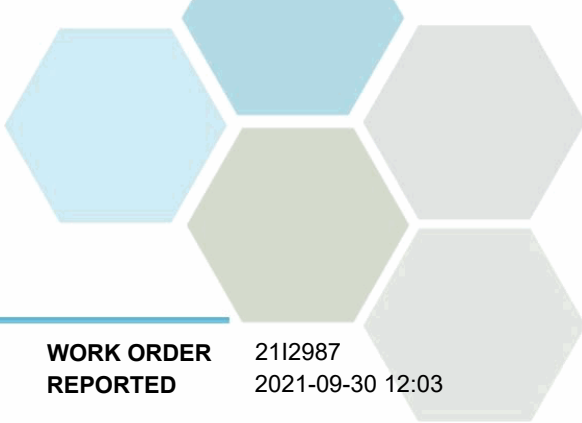
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2112987
2021-09-30 12:03

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (2112987-01) Matrix: Water Sampled: 2021-09-21 13:42					FILT, PRES

Anions

Chloride	6.00	0.10	mg/L	2021-09-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-09-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-09-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-09-23	
Sulfate	30.2	1.0	mg/L	2021-09-23	

Calculated Parameters

Hardness, Total (as CaCO3)	145	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.235	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-09-24	
Conductivity (EC)	270	2.0	µS/cm	2021-09-27	
Nitrogen, Total Kjeldahl	0.235	0.050	mg/L	2021-09-29	
pH	8.28	0.10	pH units	2021-09-27	HT2
Phosphorus, Total (as P)	0.0056	0.0050	mg/L	2021-09-28	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-09-28	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-28	

Total Metals

Calcium, total	37.7	0.20	mg/L	2021-09-29	
Magnesium, total	12.3	0.010	mg/L	2021-09-29	
Potassium, total	3.24	0.10	mg/L	2021-09-29	
Sodium, total	15.9	0.10	mg/L	2021-09-29	

Okanagan River Channel 100m Downstream (2112987-02) | Matrix: Water | Sampled: 2021-09-21 14:00

FILT,
PRES

Anions

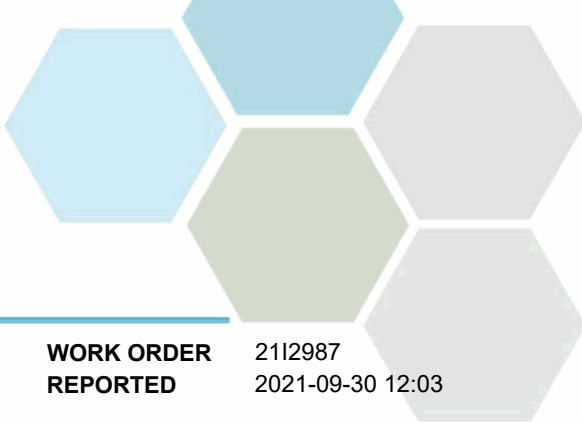
Chloride	6.08	0.10	mg/L	2021-09-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-09-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-09-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-09-23	
Sulfate	29.9	1.0	mg/L	2021-09-23	

Calculated Parameters

Hardness, Total (as CaCO3)	148	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.237	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-09-24	
Conductivity (EC)	271	2.0	µS/cm	2021-09-27	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2112987
2021-09-30 12:03

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (2112987-02) Matrix: Water Sampled: 2021-09-21 14:00, Continued					FILT, PRES

General Parameters, Continued

Nitrogen, Total Kjeldahl	0.237	0.050	mg/L	2021-09-29	
pH	8.39	0.10	pH units	2021-09-27	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-09-28	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-09-28	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-28	

Total Metals

Calcium, total	38.6	0.20	mg/L	2021-09-29	
Magnesium, total	12.6	0.010	mg/L	2021-09-29	
Potassium, total	3.31	0.10	mg/L	2021-09-29	
Sodium, total	16.1	0.10	mg/L	2021-09-29	

Okanagan River Channel 500m Downstream (2112987-03) | Matrix: Water | Sampled: 2021-09-21 14:10

FILT, PRES

Anions

Chloride	6.12	0.10	mg/L	2021-09-23	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-09-23	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-09-23	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-09-23	
Sulfate	29.9	1.0	mg/L	2021-09-23	

Calculated Parameters

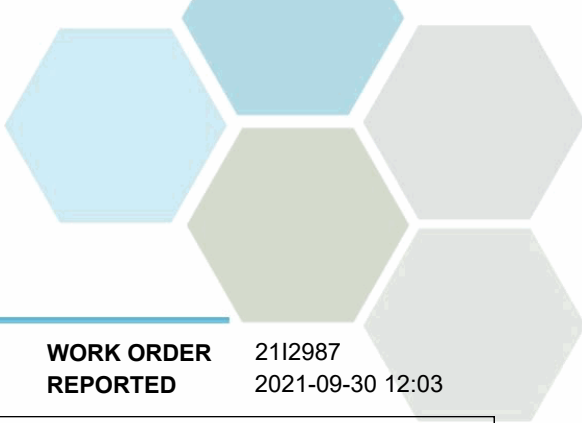
Hardness, Total (as CaCO3)	115	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.253	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-09-24	
Conductivity (EC)	270	2.0	µS/cm	2021-09-27	
Nitrogen, Total Kjeldahl	0.253	0.050	mg/L	2021-09-29	
pH	8.43	0.10	pH units	2021-09-27	HT2
Phosphorus, Total (as P)	0.0061	0.0050	mg/L	2021-09-28	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-09-28	
Solids, Total Suspended	10.8	2.0	mg/L	2021-09-28	

Total Metals

Calcium, total	29.9	0.20	mg/L	2021-09-29	
Magnesium, total	9.83	0.010	mg/L	2021-09-29	
Potassium, total	2.58	0.10	mg/L	2021-09-29	
Sodium, total	12.8	0.10	mg/L	2021-09-29	



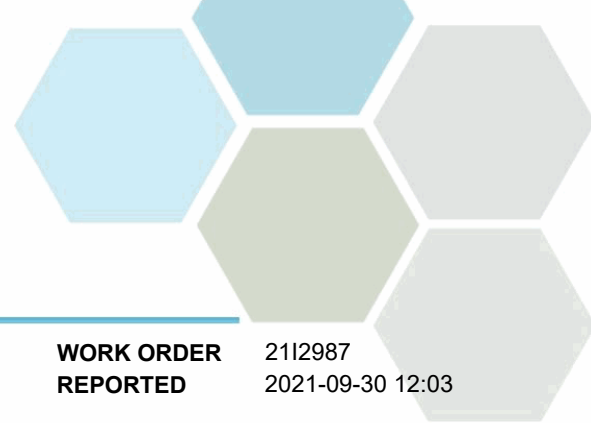
TEST RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls WWTP MORC

WORK ORDER 2112987
REPORTED 2021-09-30 12:03

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2112987
2021-09-30 12:03

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2113942
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-29 12:00 / 10.1°C 2021-09-30 13:43
PO NUMBER	OK Falls WW	COC NUMBER	B095389
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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Big Picture Sidekicks



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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.

Work Order Comments:

Custody Seals Intact: YES

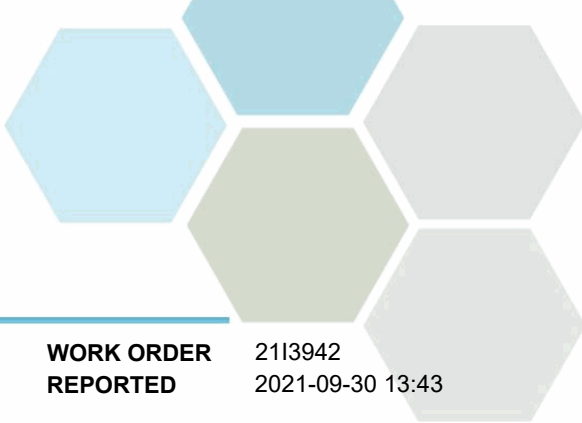
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2113942
2021-09-30 13:43

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (2113942-01) | Matrix: Water | Sampled: 2021-09-28 10:20

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	2	1	MPN/100 mL	2021-09-29	
E. coli (Q-Tray)	2	1	MPN/100 mL	2021-09-29	

Okanagan River Channel 100m Downstream - Bacteria (2113942-02) | Matrix: Water | Sampled: 2021-09-28 10:25

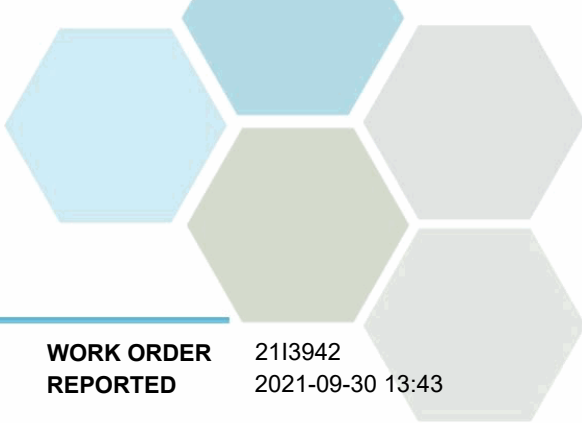
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	5	1	MPN/100 mL	2021-09-29	
E. coli (Q-Tray)	5	1	MPN/100 mL	2021-09-29	

Okanagan River Channel 500m Downstream - Bacteria (2113942-03) | Matrix: Water | Sampled: 2021-09-28 10:30

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	3	1	MPN/100 mL	2021-09-29	
E. coli (Q-Tray)	3	1	MPN/100 mL	2021-09-29	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 2113942
2021-09-30 13:43

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP QORC

PROJECT INFO

WORK ORDER 21J3497

RECEIVED / TEMP 2021-10-26 12:10 / 4.0°C

REPORTED 2021-10-28 11:05

COC NUMBER No Number

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

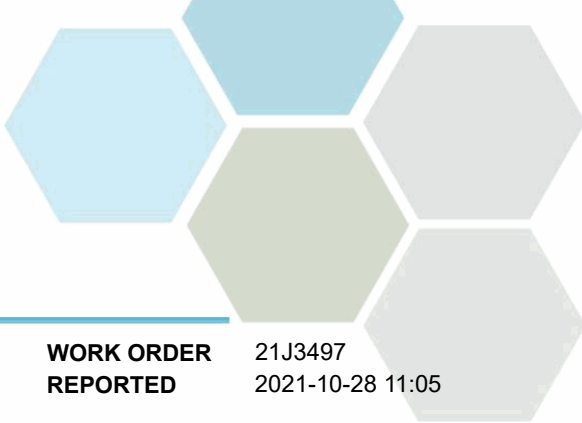
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21J3497
2021-10-28 11:05

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21J3497-01) | Matrix: Water | Sampled: 2021-10-25 10:50

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	7	1	MPN/100 mL	2021-10-26	
E. coli (Q-Tray)	4	1	MPN/100 mL	2021-10-26	

Okanagan River Channel 100m Downstream - Bacteria (21J3497-02) | Matrix: Water | Sampled: 2021-10-25 11:05

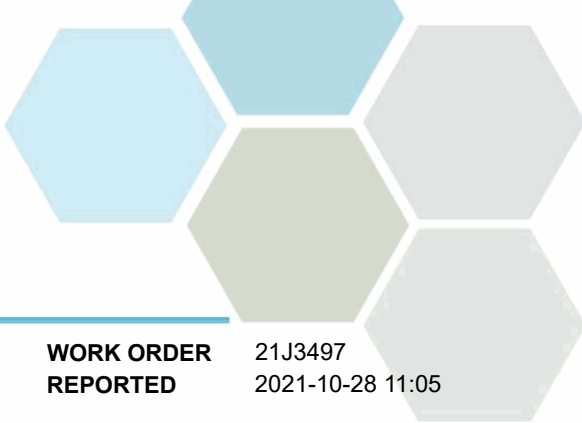
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	5	1	MPN/100 mL	2021-10-26	
E. coli (Q-Tray)	1	1	MPN/100 mL	2021-10-26	

Okanagan River Channel 500m Downstream - Bacteria (21J3497-03) | Matrix: Water | Sampled: 2021-10-25 11:20

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	50	1	MPN/100 mL	2021-10-26	
E. coli (Q-Tray)	49	1	MPN/100 mL	2021-10-26	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21J3497
2021-10-28 11:05

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J3500
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-26 12:10 / 4.0°C 2021-11-02 12:32
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP QORC		
PROJECT INFO			

Introduction:

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Work Order Comments:

Custody Seals Intact: N/A

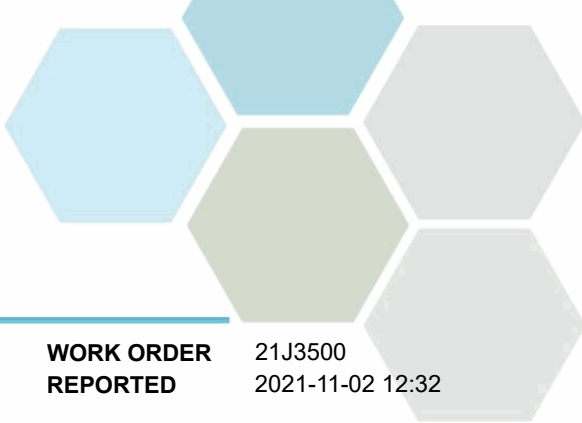
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21J3500
2021-11-02 12:32

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21J3500-01) Matrix: Water Sampled: 2021-10-25					FILT, PRES

Anions

Chloride	5.83	0.10	mg/L	2021-10-28	
Fluoride	0.14	0.10	mg/L	2021-10-28	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-10-28	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-10-28	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-10-28	
Sulfate	29.6	1.0	mg/L	2021-10-28	

Calculated Parameters

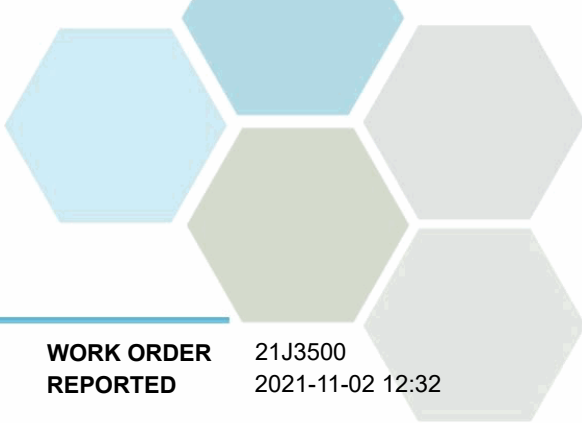
Hardness, Total (as CaCO3)	129	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.291	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	123	1.0	mg/L	2021-10-30	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	
Alkalinity, Bicarbonate (as CaCO3)	123	1.0	mg/L	2021-10-30	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-10-29	
BOD, 5-day	1.9	2.0	mg/L	2021-11-01	
Chemical Oxygen Demand	10	20	mg/L	2021-10-28	
Conductivity (EC)	275	2.0	µS/cm	2021-10-30	
Nitrogen, Total Kjeldahl	0.291	0.050	mg/L	2021-11-01	
pH	8.18	0.10	pH units	2021-10-30	HT2
Phosphorus, Total (as P)	0.0088	0.0050	mg/L	2021-11-01	
Phosphorus, Total Dissolved	0.0052	0.0050	mg/L	2021-11-01	
Solids, Total Suspended	< 2.9	2.0	mg/L	2021-11-01	

Total Metals

Aluminum, total	0.0265	0.0050	mg/L	2021-10-30	
Antimony, total	< 0.00020	0.00020	mg/L	2021-10-30	
Arsenic, total	< 0.00050	0.00050	mg/L	2021-10-30	
Barium, total	0.0237	0.0050	mg/L	2021-10-30	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-10-30	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-10-30	
Boron, total	< 0.0500	0.0500	mg/L	2021-10-30	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-10-30	
Calcium, total	34.6	0.20	mg/L	2021-10-30	
Chromium, total	< 0.00050	0.00050	mg/L	2021-10-30	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-10-30	
Copper, total	0.00108	0.00040	mg/L	2021-10-30	
Iron, total	0.025	0.010	mg/L	2021-10-30	
Lead, total	< 0.00020	0.00020	mg/L	2021-10-30	
Lithium, total	0.00327	0.00010	mg/L	2021-10-30	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21J3500
2021-11-02 12:32

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21J3500-01) Matrix: Water Sampled: 2021-10-25, Continued					FILT, PRES

Total Metals, Continued

Magnesium, total	10.3	0.010	mg/L	2021-10-30	
Manganese, total	0.00499	0.00020	mg/L	2021-10-30	
Mercury, total	< 0.000010	0.000010	mg/L	2021-10-30	
Molybdenum, total	0.00331	0.00010	mg/L	2021-10-30	
Nickel, total	< 0.00040	0.00040	mg/L	2021-10-30	
Phosphorus, total	< 0.050	0.050	mg/L	2021-10-30	
Potassium, total	2.72	0.10	mg/L	2021-10-30	
Selenium, total	< 0.00050	0.00050	mg/L	2021-10-30	
Silicon, total	3.3	1.0	mg/L	2021-10-30	
Silver, total	< 0.000050	0.000050	mg/L	2021-10-30	
Sodium, total	12.4	0.10	mg/L	2021-10-30	
Strontium, total	0.300	0.0010	mg/L	2021-10-30	
Sulfur, total	8.8	3.0	mg/L	2021-10-30	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-10-30	
Thallium, total	< 0.000020	0.000020	mg/L	2021-10-30	
Thorium, total	< 0.00010	0.00010	mg/L	2021-10-30	
Tin, total	< 0.00020	0.00020	mg/L	2021-10-30	
Titanium, total	< 0.0050	0.0050	mg/L	2021-10-30	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-10-30	
Uranium, total	0.00238	0.000020	mg/L	2021-10-30	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-10-30	
Zinc, total	< 0.0040	0.0040	mg/L	2021-10-30	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-10-30	

Okanagan River Channel 100m Downstream (21J3500-02) | Matrix: Water | Sampled: 2021-10-25

FILT,
PRES

Anions

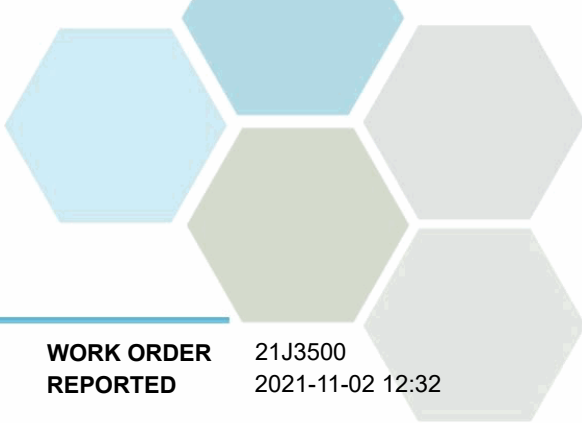
Chloride	6.17	0.10	mg/L	2021-10-28	
Fluoride	0.13	0.10	mg/L	2021-10-28	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-10-28	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-10-28	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-10-28	
Sulfate	30.1	1.0	mg/L	2021-10-28	

Calculated Parameters

Hardness, Total (as CaCO3)	126	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.235	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	123	1.0	mg/L	2021-10-30	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21J3500
2021-11-02 12:32

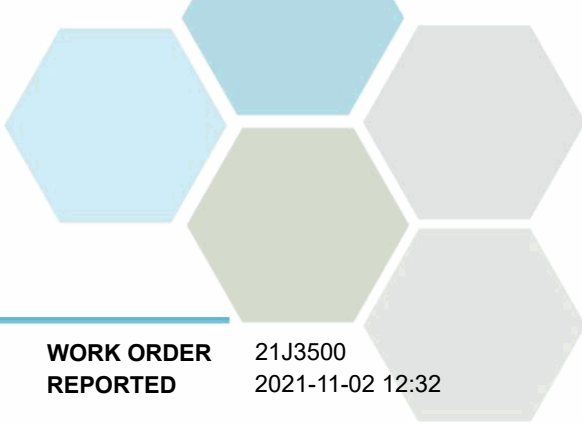
Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21J3500-02) Matrix: Water Sampled: 2021-10-25, Continued					FILT, PRES

General Parameters, Continued

Alkalinity, Bicarbonate (as CaCO3)	123	1.0	mg/L	2021-10-30	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-10-29	
BOD, 5-day	1.0	2.0	mg/L	2021-11-01	
Chemical Oxygen Demand	15	20	mg/L	2021-10-28	
Conductivity (EC)	275	2.0	µS/cm	2021-10-30	
Nitrogen, Total Kjeldahl	0.235	0.050	mg/L	2021-11-01	
pH	8.17	0.10	pH units	2021-10-30	HT2
Phosphorus, Total (as P)	0.0164	0.0050	mg/L	2021-11-01	
Phosphorus, Total Dissolved	< 0.0050	0.0050	mg/L	2021-11-01	
Solids, Total Suspended	< 2.9	2.0	mg/L	2021-11-01	

Total Metals

Aluminum, total	0.0389	0.0050	mg/L	2021-10-30	
Antimony, total	< 0.00020	0.00020	mg/L	2021-10-30	
Arsenic, total	0.00056	0.00050	mg/L	2021-10-30	
Barium, total	0.0233	0.0050	mg/L	2021-10-30	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-10-30	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-10-30	
Boron, total	< 0.0500	0.0500	mg/L	2021-10-30	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-10-30	
Calcium, total	34.1	0.20	mg/L	2021-10-30	
Chromium, total	< 0.00050	0.00050	mg/L	2021-10-30	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-10-30	
Copper, total	0.00127	0.00040	mg/L	2021-10-30	
Iron, total	0.048	0.010	mg/L	2021-10-30	
Lead, total	< 0.00020	0.00020	mg/L	2021-10-30	
Lithium, total	0.00325	0.00010	mg/L	2021-10-30	
Magnesium, total	9.93	0.010	mg/L	2021-10-30	
Manganese, total	0.00637	0.00020	mg/L	2021-10-30	
Mercury, total	< 0.000010	0.000010	mg/L	2021-10-30	
Molybdenum, total	0.00332	0.00010	mg/L	2021-10-30	
Nickel, total	0.00091	0.00040	mg/L	2021-10-30	
Phosphorus, total	< 0.050	0.050	mg/L	2021-10-30	
Potassium, total	2.66	0.10	mg/L	2021-10-30	
Selenium, total	< 0.00050	0.00050	mg/L	2021-10-30	
Silicon, total	3.1	1.0	mg/L	2021-10-30	
Silver, total	< 0.000050	0.000050	mg/L	2021-10-30	
Sodium, total	12.0	0.10	mg/L	2021-10-30	
Strontium, total	0.289	0.0010	mg/L	2021-10-30	
Sulfur, total	10.1	3.0	mg/L	2021-10-30	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-10-30	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21J3500
2021-11-02 12:32

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21J3500-02) Matrix: Water Sampled: 2021-10-25, Continued					FILT, PRES

Total Metals, Continued

Thallium, total	< 0.000020	0.000020	mg/L	2021-10-30	
Thorium, total	< 0.00010	0.00010	mg/L	2021-10-30	
Tin, total	< 0.00020	0.00020	mg/L	2021-10-30	
Titanium, total	< 0.0050	0.0050	mg/L	2021-10-30	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-10-30	
Uranium, total	0.00226	0.000020	mg/L	2021-10-30	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-10-30	
Zinc, total	0.0135	0.0040	mg/L	2021-10-30	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-10-30	

Okanagan River Channel 500m Downstream (21J3500-03) | Matrix: Water | Sampled: 2021-10-25

FILT,
PRES

Anions

Chloride	5.96	0.10	mg/L	2021-10-28	
Fluoride	0.13	0.10	mg/L	2021-10-28	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-10-28	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-10-28	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-10-28	
Sulfate	29.6	1.0	mg/L	2021-10-28	

Calculated Parameters

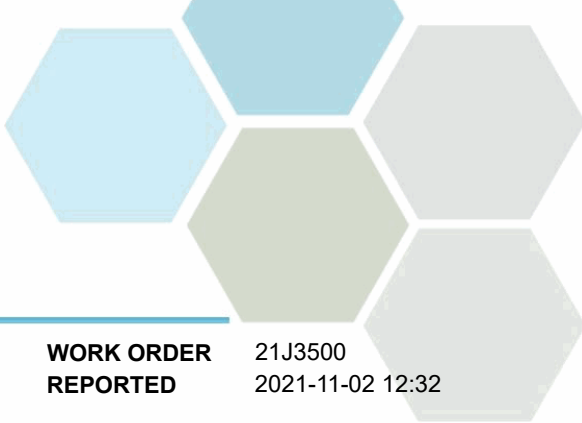
Hardness, Total (as CaCO3)	124	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.354	0.0500	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	122	1.0	mg/L	2021-10-30	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	
Alkalinity, Bicarbonate (as CaCO3)	122	1.0	mg/L	2021-10-30	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-10-30	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-10-29	
BOD, 5-day	< 1.0	2.0	mg/L	2021-11-01	
Chemical Oxygen Demand	11	20	mg/L	2021-10-28	
Conductivity (EC)	274	2.0	µS/cm	2021-10-30	
Nitrogen, Total Kjeldahl	0.354	0.050	mg/L	2021-11-01	
pH	8.17	0.10	pH units	2021-10-30	HT2
Phosphorus, Total (as P)	0.0114	0.0050	mg/L	2021-11-01	
Phosphorus, Total Dissolved	0.0060	0.0050	mg/L	2021-11-01	
Solids, Total Suspended	< 3.3	2.0	mg/L	2021-11-01	

Total Metals

Aluminum, total	0.0184	0.0050	mg/L	2021-10-31	
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TEST RESULTS

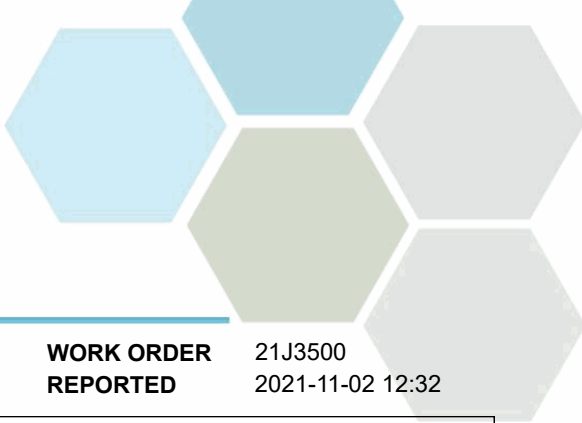
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21J3500
2021-11-02 12:32

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 500m Downstream (21J3500-03) Matrix: Water Sampled: 2021-10-25, Continued					FILT, PRES

Total Metals, Continued

Antimony, total	< 0.00020	0.00020	mg/L	2021-10-31	
Arsenic, total	0.00053	0.00050	mg/L	2021-10-31	
Barium, total	0.0219	0.0050	mg/L	2021-10-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2021-10-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2021-10-31	
Boron, total	< 0.0500	0.0500	mg/L	2021-10-31	
Cadmium, total	< 0.000010	0.000010	mg/L	2021-10-31	
Calcium, total	33.2	0.20	mg/L	2021-10-31	
Chromium, total	< 0.00050	0.00050	mg/L	2021-10-31	
Cobalt, total	< 0.00010	0.00010	mg/L	2021-10-31	
Copper, total	0.0189	0.00040	mg/L	2021-10-31	
Iron, total	0.019	0.010	mg/L	2021-10-31	
Lead, total	< 0.00020	0.00020	mg/L	2021-10-31	
Lithium, total	0.00359	0.00010	mg/L	2021-10-31	
Magnesium, total	10.0	0.010	mg/L	2021-10-31	
Manganese, total	0.00516	0.00020	mg/L	2021-10-31	
Mercury, total	< 0.000010	0.000010	mg/L	2021-10-30	
Molybdenum, total	0.00322	0.00010	mg/L	2021-10-31	
Nickel, total	< 0.00040	0.00040	mg/L	2021-10-31	
Phosphorus, total	< 0.050	0.050	mg/L	2021-10-31	
Potassium, total	2.42	0.10	mg/L	2021-10-31	
Selenium, total	< 0.00050	0.00050	mg/L	2021-10-31	
Silicon, total	3.2	1.0	mg/L	2021-10-31	
Silver, total	< 0.000050	0.000050	mg/L	2021-10-31	
Sodium, total	12.7	0.10	mg/L	2021-10-31	
Strontium, total	0.274	0.0010	mg/L	2021-10-31	
Sulfur, total	9.7	3.0	mg/L	2021-10-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2021-10-31	
Thallium, total	< 0.000020	0.000020	mg/L	2021-10-31	
Thorium, total	< 0.00010	0.00010	mg/L	2021-10-31	
Tin, total	< 0.00020	0.00020	mg/L	2021-10-31	
Titanium, total	< 0.0050	0.0050	mg/L	2021-10-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2021-10-31	
Uranium, total	0.00250	0.000020	mg/L	2021-10-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2021-10-31	
Zinc, total	< 0.0040	0.0040	mg/L	2021-10-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2021-10-31	



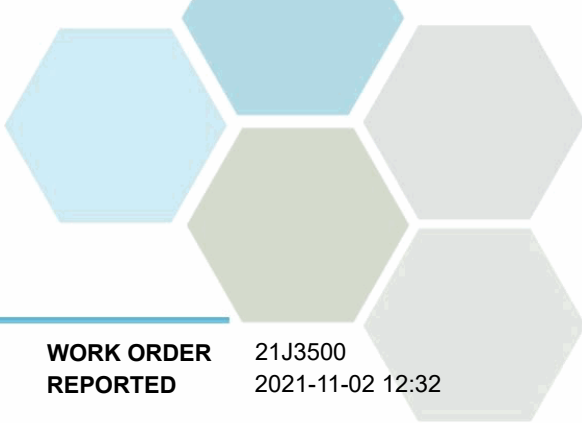
TEST RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls WWTP QORC

WORK ORDER 21J3500
REPORTED 2021-11-02 12:32

Sample Qualifiers:

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

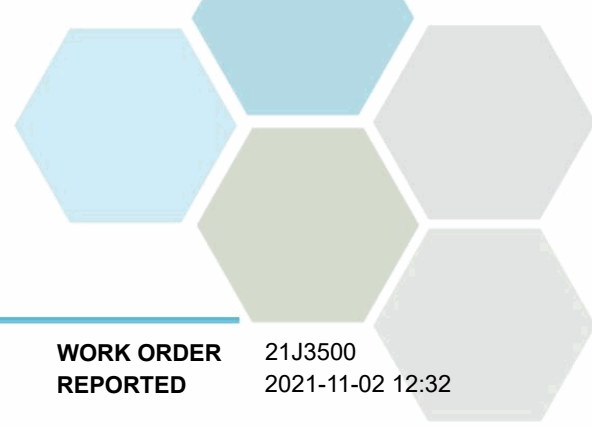
WORK ORDER REPORTED 21J3500
2021-11-02 12:32

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
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 PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP QORC

WORK ORDER REPORTED 21J3500
2021-11-02 12:32

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. The quality control (QC) data is available upon request

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.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K1276
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-09 12:00 / 4.1°C 2021-11-12 15:20
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: N/A

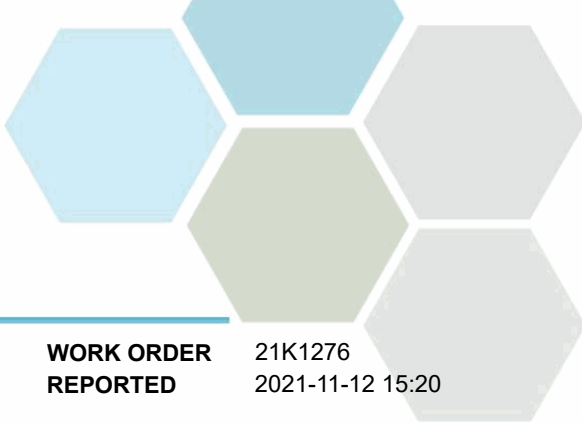
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21K1276
2021-11-12 15:20

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21K1276-01) | Matrix: Water | Sampled: 2021-11-08 13:40

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	6	1	MPN/100 mL	2021-11-09	
E. coli (Q-Tray)	5	1	MPN/100 mL	2021-11-09	

Okanagan River Channel 100m Downstream - Bacteria (21K1276-02) | Matrix: Water | Sampled: 2021-11-08 13:55

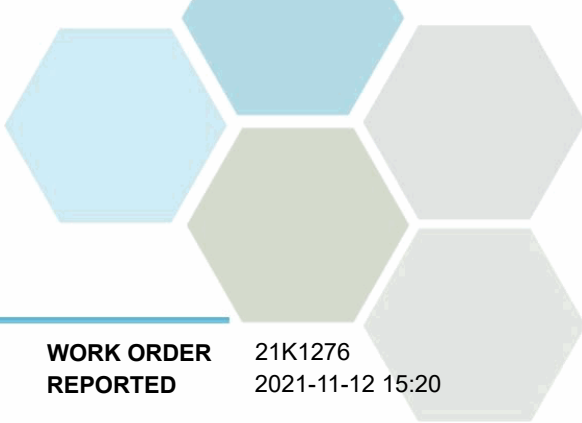
Microbiological Parameters

Coliforms, Fecal (Q-Tray)	3	1	MPN/100 mL	2021-11-09	
E. coli (Q-Tray)	3	1	MPN/100 mL	2021-11-09	

Okanagan River Channel 500m Downstream - Bacteria (21K1276-03) | Matrix: Water | Sampled: 2021-11-08 14:10

Microbiological Parameters

Coliforms, Fecal (Q-Tray)	3	1	MPN/100 mL	2021-11-09	
E. coli (Q-Tray)	3	1	MPN/100 mL	2021-11-09	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21K1276
2021-11-12 15:20

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K1279
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-09 12:00 / 4.1°C 2021-11-17 11:47
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

Introduction:

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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.

Work Order Comments:

Custody Seals Intact: N/A

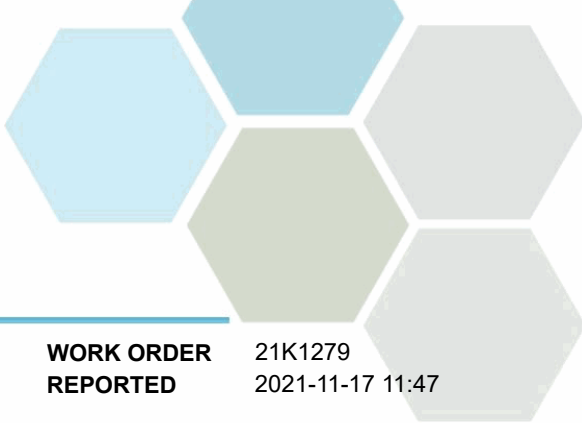
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21K1279
2021-11-17 11:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21K1279-01) Matrix: Water Sampled: 2021-11-08 13:40					FILT, PRES

Anions

Chloride	5.82	0.10	mg/L	2021-11-10	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-11-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-11-10	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-11-10	
Sulfate	29.2	1.0	mg/L	2021-11-10	

Calculated Parameters

Hardness, Total (as CaCO3)	129	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.229	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-11-10	
Conductivity (EC)	256	2.0	µS/cm	2021-11-10	
Nitrogen, Total Kjeldahl	0.229	0.050	mg/L	2021-11-12	
pH	8.04	0.10	pH units	2021-11-10	HT2
Phosphorus, Total (as P)	0.0162	0.0050	mg/L	2021-11-10	
Phosphorus, Total Dissolved	0.0098	0.0050	mg/L	2021-11-10	
Solids, Total Suspended	2.4	2.0	mg/L	2021-11-16	HT1

Total Metals

Calcium, total	33.4	0.20	mg/L	2021-11-13	
Magnesium, total	11.0	0.010	mg/L	2021-11-13	
Potassium, total	2.89	0.10	mg/L	2021-11-13	
Sodium, total	13.9	0.10	mg/L	2021-11-13	

Okanagan River Channel 100m Downstream (21K1279-02) | Matrix: Water | Sampled: 2021-11-08 13:55

FILT, PRES

Anions

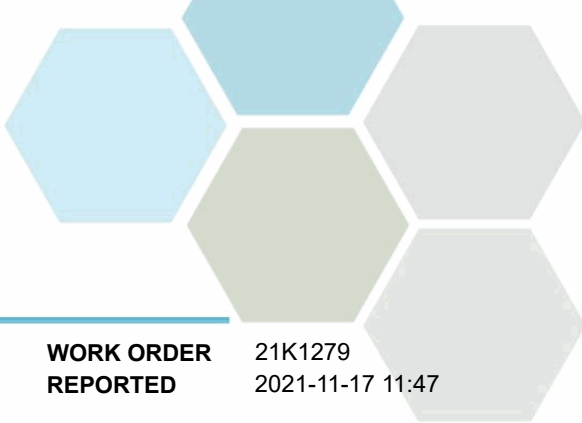
Chloride	6.10	0.10	mg/L	2021-11-10	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-11-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-11-10	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-11-10	
Sulfate	29.9	1.0	mg/L	2021-11-10	

Calculated Parameters

Hardness, Total (as CaCO3)	133	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.238	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-11-10	
Conductivity (EC)	265	2.0	µS/cm	2021-11-10	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21K1279
2021-11-17 11:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21K1279-02) Matrix: Water Sampled: 2021-11-08 13:55, Continued					FILT, PRES

General Parameters, Continued

Nitrogen, Total Kjeldahl	0.238	0.050	mg/L	2021-11-12	
pH	8.11	0.10	pH units	2021-11-10	HT2
Phosphorus, Total (as P)	0.0152	0.0050	mg/L	2021-11-10	
Phosphorus, Total Dissolved	0.0090	0.0050	mg/L	2021-11-10	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-16	HT1

Total Metals

Calcium, total	35.5	0.20	mg/L	2021-11-13	
Magnesium, total	10.9	0.010	mg/L	2021-11-13	
Potassium, total	2.73	0.10	mg/L	2021-11-13	
Sodium, total	13.6	0.10	mg/L	2021-11-13	

Okanagan River Channel 500m Downstream (21K1279-03) | Matrix: Water | Sampled: 2021-11-08 14:10

FILT, PRES

Anions

Chloride	6.07	0.10	mg/L	2021-11-10	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-11-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-11-10	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-11-10	
Sulfate	29.6	1.0	mg/L	2021-11-10	

Calculated Parameters

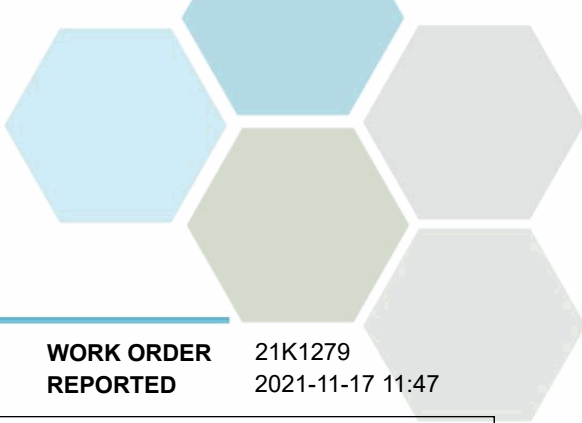
Hardness, Total (as CaCO3)	127	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.220	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-11-10	
Conductivity (EC)	261	2.0	µS/cm	2021-11-10	
Nitrogen, Total Kjeldahl	0.220	0.050	mg/L	2021-11-12	
pH	8.19	0.10	pH units	2021-11-10	HT2
Phosphorus, Total (as P)	0.0197	0.0050	mg/L	2021-11-10	
Phosphorus, Total Dissolved	0.0112	0.0050	mg/L	2021-11-10	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-16	HT1

Total Metals

Calcium, total	33.5	0.20	mg/L	2021-11-13	
Magnesium, total	10.5	0.010	mg/L	2021-11-13	
Potassium, total	2.71	0.10	mg/L	2021-11-13	
Sodium, total	13.4	0.10	mg/L	2021-11-13	



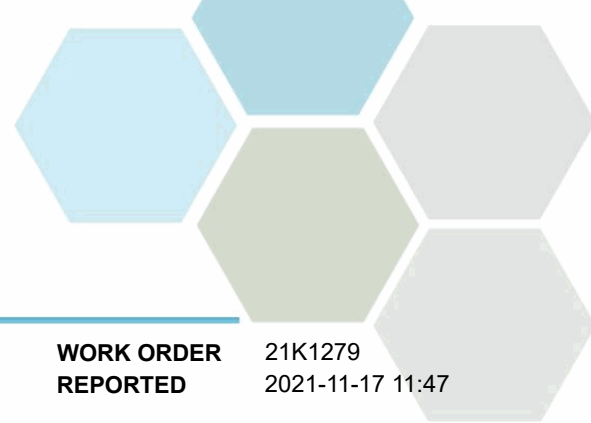
TEST RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls WWTP MORC

WORK ORDER 21K1279
REPORTED 2021-11-17 11:47

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- 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.
- PRES Sample has been preserved for TP, TDP, NH3 in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21K1279
2021-11-17 11:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls WW

PROJECT OK Falls WWTP MORC

PROJECT INFO

WORK ORDER 21L1219

RECEIVED / TEMP 2021-12-08 13:45 / 7.0°C

REPORTED 2021-12-10 17:45

COC NUMBER No Number

Introduction:

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Work Order Comments:

Custody Seals Intact: YES

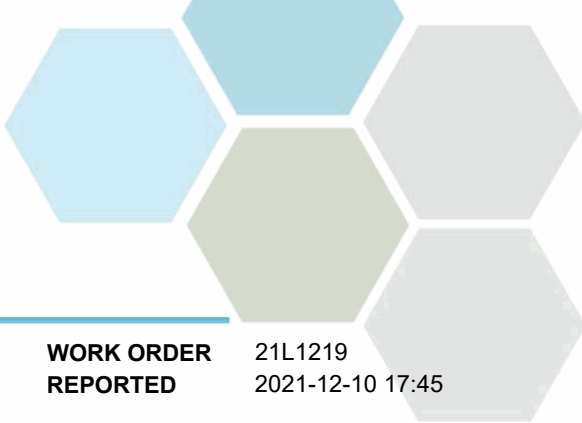
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21L1219
2021-12-10 17:45

Analyte	Result	RL	Units	Analyzed	Qualifier
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Okanagan River Channel 100m Upstream - Bacteria (21L1219-01) | Matrix: Water | Sampled: 2021-12-07 09:55

Microbiological Parameters

Coliforms, Fecal	3		MPN/100 mL	2021-12-08	
E. coli	3		MPN/100 mL	2021-12-08	

Okanagan River Channel 100m Downstream - Bacteria (21L1219-02) | Matrix: Water | Sampled: 2021-12-07 00:00 To 2021-12-07 10:10

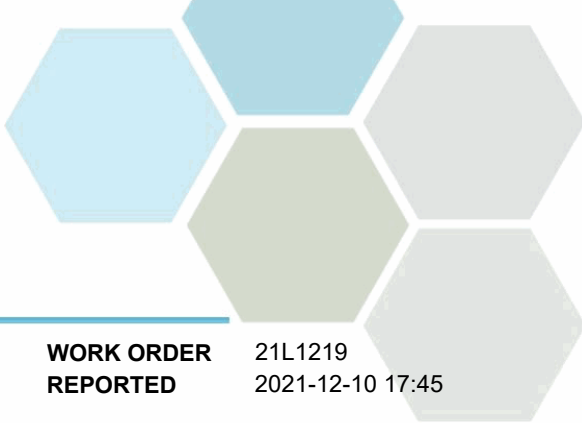
Microbiological Parameters

Coliforms, Fecal	7		MPN/100 mL	2021-12-08	
E. coli	5		MPN/100 mL	2021-12-08	

Okanagan River Channel 500m Downstream - Bacteria (21L1219-03) | Matrix: Water | Sampled: 2021-12-07 11:33

Microbiological Parameters

Coliforms, Fecal	8		MPN/100 mL	2021-12-08	
E. coli	4		MPN/100 mL	2021-12-08	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21L1219
2021-12-10 17:45

Analysis Description	Method Ref.	Technique	Accredited	Location
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna

Glossary of Terms:

RL	Reporting Limit (default)
MPN/100 mL	Most Probable Number per 100 millilitres
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21L1220
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-12-08 13:45 / 7.0°C 2021-12-15 16:55
PO NUMBER	OK Falls WW	COC NUMBER	No Number
PROJECT	OK Falls WWTP MORC		
PROJECT INFO			

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Work Order Comments:

Custody Seals Intact: YES

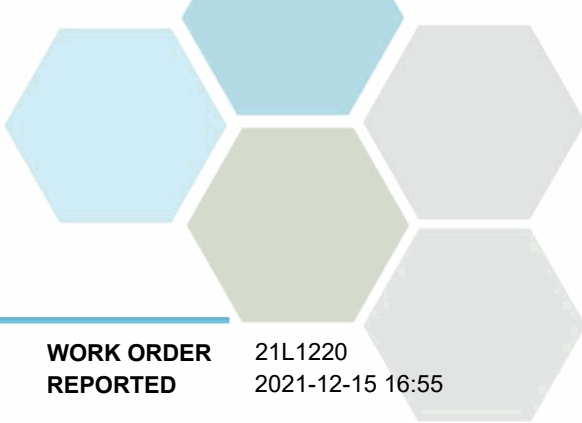
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Authorized By:

Brent Whitehead
Client Scientist - Team Lead

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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21L1220
2021-12-15 16:55

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Upstream (21L1220-01) Matrix: Water Sampled: 2021-12-07 09:55					FILT, PRES

Anions

Chloride	6.46	0.10	mg/L	2021-12-09	
Nitrate (as N)	0.021	0.010	mg/L	2021-12-09	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-12-09	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-12-09	
Sulfate	28.4	1.0	mg/L	2021-12-09	

Calculated Parameters

Hardness, Total (as CaCO3)	124	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	0.0208	0.0100	mg/L	N/A	
Nitrogen, Total	0.251	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-12-09	
Conductivity (EC)	275	2.0	µS/cm	2021-12-08	
Nitrogen, Total Kjeldahl	0.230	0.050	mg/L	2021-12-13	
pH	7.88	0.10	pH units	2021-12-08	HT2
Phosphorus, Total (as P)	0.0285	0.0050	mg/L	2021-12-14	
Phosphorus, Total Dissolved	0.0198	0.0050	mg/L	2021-12-14	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-12-11	

Total Metals

Calcium, total	32.2	0.20	mg/L	2021-12-11	
Magnesium, total	10.7	0.010	mg/L	2021-12-11	
Potassium, total	2.87	0.10	mg/L	2021-12-11	
Sodium, total	12.8	0.10	mg/L	2021-12-11	

Okanagan River Channel 100m Downstream (21L1220-02) | Matrix: Water | Sampled: 2021-12-07 10:10

FILT,
PRES

Anions

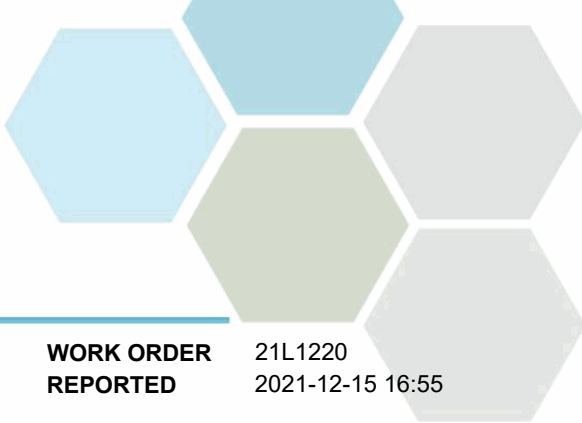
Chloride	6.60	0.10	mg/L	2021-12-09	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-12-09	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-12-09	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-12-09	
Sulfate	29.9	1.0	mg/L	2021-12-09	

Calculated Parameters

Hardness, Total (as CaCO3)	126	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.378	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-12-09	
Conductivity (EC)	280	2.0	µS/cm	2021-12-08	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21L1220
2021-12-15 16:55

Analyte	Result	RL	Units	Analyzed	Qualifier
Okanagan River Channel 100m Downstream (21L1220-02) Matrix: Water Sampled: 2021-12-07 10:10, Continued					FILT, PRES

General Parameters, Continued

Nitrogen, Total Kjeldahl	0.378	0.050	mg/L	2021-12-13	
pH	8.01	0.10	pH units	2021-12-08	HT2
Phosphorus, Total (as P)	0.0300	0.0050	mg/L	2021-12-14	
Phosphorus, Total Dissolved	0.0205	0.0050	mg/L	2021-12-14	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-12-11	

Total Metals

Calcium, total	32.9	0.20	mg/L	2021-12-11	
Magnesium, total	10.6	0.010	mg/L	2021-12-11	
Potassium, total	2.80	0.10	mg/L	2021-12-11	
Sodium, total	12.5	0.10	mg/L	2021-12-11	

Okanagan River Channel 500m Downstream (21L1220-03) | Matrix: Water | Sampled: 2021-12-07 11:33

FILT, PRES

Anions

Chloride	6.55	0.10	mg/L	2021-12-09	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-12-09	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-12-09	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-12-09	
Sulfate	29.4	1.0	mg/L	2021-12-09	

Calculated Parameters

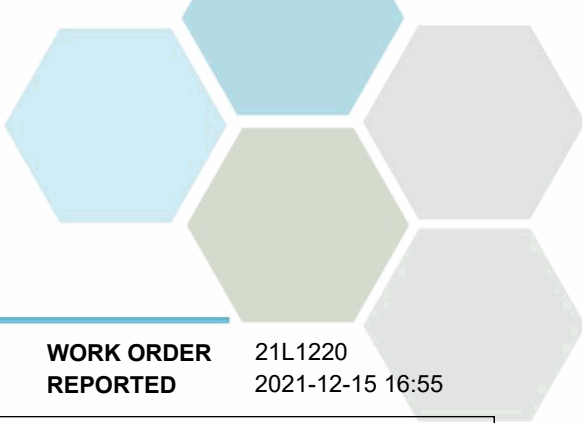
Hardness, Total (as CaCO3)	128	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	0.280	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-12-09	
Conductivity (EC)	282	2.0	µS/cm	2021-12-08	
Nitrogen, Total Kjeldahl	0.280	0.050	mg/L	2021-12-13	
pH	8.02	0.10	pH units	2021-12-08	HT2
Phosphorus, Total (as P)	0.0312	0.0050	mg/L	2021-12-14	
Phosphorus, Total Dissolved	0.0234	0.0050	mg/L	2021-12-14	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-12-11	

Total Metals

Calcium, total	33.3	0.20	mg/L	2021-12-11	
Magnesium, total	10.7	0.010	mg/L	2021-12-11	
Potassium, total	2.89	0.10	mg/L	2021-12-11	
Sodium, total	13.2	0.10	mg/L	2021-12-11	



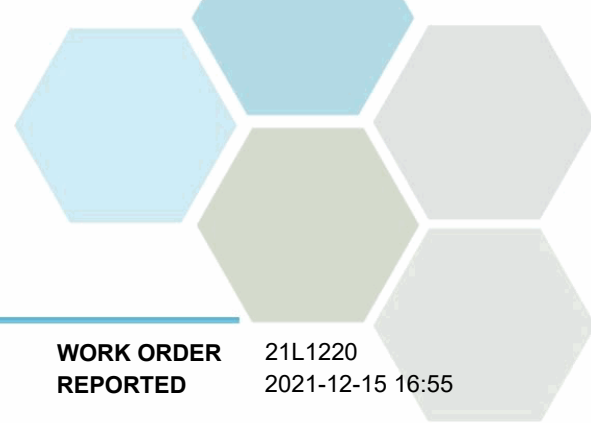
TEST RESULTS

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls WWTP MORC

WORK ORDER 21L1220
REPORTED 2021-12-15 16:55

Sample Qualifiers:

- FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for TP, TDP, NH3, TKN in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls WWTP MORC

WORK ORDER REPORTED 21L1220
2021-12-15 16:55

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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 S

Vaseux Lake Water Quality Monitoring Database Summary 2021

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Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Sampling Location	Unit	Average	Minimum	Maximum	Standard Deviation	Number of Results	Number of Numerical Results	Number of Results with Exceedances
Field Results									
Secchi depth	Vaseux Lake	m	5.49	3.55	7.25	1.11	9	9	0
Conductivity	Vaseux Lake 1, 5, 10 m composite	µS/cm	290.9	283.3	295.7	4.69	9	9	0
	Vaseux Lake 20, 22, 24 m composite	µS/cm	296.91	292.03	302.07	2.92	9	9	0
Density	Vaseux Lake 1, 5, 10 m composite	kg/m ³	1000.35	998.116	1009.276	3.425	9	9	0
	Vaseux Lake 20, 22, 24 m composite	kg/m ³	1000.655	999.956	1005.853	1.95	9	9	0
Dissolved oxygen	Vaseux Lake 1, 5, 10 m composite	mg/L	9.63	5.88	13.44	2.43	9	9	2
	Vaseux Lake 20, 22, 24 m composite	mg/L	5.6	-0.19	13.33	5.55	9	9	5
Dissolved oxygen (percent)	Vaseux Lake 1, 5, 10 m composite	%	90.35	63.07	102.8	12.84	9	9	0
	Vaseux Lake 20, 22, 24 m composite	%	45.56	-1.6	101.6	44.41	9	9	0
pH	Vaseux Lake 1, 5, 10 m composite		8.73	8.57	8.9	0.12	9	9	0
	Vaseux Lake 20, 22, 24 m composite		8.14	7.72	8.81	0.44	9	9	0
Salinity	Vaseux Lake 1, 5, 10 m composite		0.14	0.13	0.14	0	9	9	0
	Vaseux Lake 20, 22, 24 m composite		0.14	0.14	0.15	0	9	9	0
Temperature	Vaseux Lake 1, 5, 10 m composite	°C	13.17	4.07	20.27	5.62	9	9	4
	Vaseux Lake 20, 22, 24 m composite	°C	7.44	3.93	8.57	1.52	9	9	0
Total dissolved solids	Vaseux Lake 1, 5, 10 m composite	mg/L	189.07	184.33	192	3.03	9	9	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	193.04	190	196.33	1.9	9	9	0
Lab Results									
General									
Chloride	Vaseux Lake 1, 5, 10 m composite	mg/L	5.84	5.42	6.4	0.31	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	5.95	5.65	6.32	0.24	11	11	0
Chlorophyll a	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00163	0.00107	0.00244	0.000549	9	8	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.0011	0.00032	0.00235	0.0008	9	6	0
Hardness, Total (total as CaCO ₃)	Vaseux Lake 1, 5, 10 m composite	mg/L	121	116	134	5	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	124	116	133	5	11	11	0
Sulphate	Vaseux Lake 1, 5, 10 m composite	mg/L	28.5	26.8	29.5	1	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	27.1	24.1	30	1.8	11	11	0
Nutrients									
Ammonia (total, as N)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.018	0.02	0.029	0.008	11	6	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.086	<0.020	0.327	0.094	11	8	0
Nitrate (as N)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.028	<0.010	0.094	0.031	11	5	0
Nitrite (as N)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Total nitrogen	Vaseux Lake 1, 5, 10 m composite	mg/L	0.33	0.172	0.974	0.229	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.395	0.2	1.03	0.242	11	11	0
Total kjeldahl nitrogen	Vaseux Lake 1, 5, 10 m composite	mg/L	0.33	0.172	0.974	0.229	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.369	0.2	0.975	0.225	11	11	0
Total organic nitrogen	Vaseux Lake 1, 5, 10 m composite	mg/L	0.317	0.172	0.945	0.224	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.286	0.146	0.902	0.213	11	11	0

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Water Quality Results

Orthophosphate (dissolved, as P)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.013	<0.0050	0.0646	0.0209	11	3	0
Phosphorus (total, by ICPMS/ICPOES)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.028	<0.050	0.061	0.011	11	1	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.07	<0.050	0.235	0.063	11	6	0
Phosphorus (total, APHA 4500-P)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.0133	0.0103	0.0227	0.0035	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.0612	0.0115	0.192	0.0543	11	11	0
Phosphorus (dissolved, APHA 4500-P)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.0106	0.005	0.0173	0.004	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.0363	0.0063	0.161	0.0456	11	11	0
Potassium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	2.51	2.28	2.73	0.14	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	2.59	2.42	2.73	0.09	11	11	0
Total Metals									
Aluminum (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.0179	0.009	0.0432	0.0091	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.0362	0.0106	0.0653	0.0186	11	11	0
Antimony (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.00011	<0.00020	0.00022	0.00004	11	1	0
Arsenic (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00039	0.0005	0.00053	0.00014	11	6	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.00064	0.00052	0.00085	0.00009	11	11	0
Barium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.0238	0.0223	0.0253	0.0009	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.0259	0.0237	0.0282	0.0016	11	11	0
Beryllium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Bismuth (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Boron (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Cadmium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Calcium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	32.5	31.4	37.1	1.6	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	33.8	31	36.9	1.8	11	11	0
Chromium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Cobalt (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Copper (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00109	0.00065	0.00253	0.00051	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.00068	0.0004	0.00104	0.00019	11	11	0
Iron (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.03	0.019	0.047	0.009	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.255	0.02	0.875	0.24	11	11	2
Lead (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Lithium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00344	0.00317	0.00376	0.00019	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.00345	0.00303	0.0037	0.0002	11	11	0
Magnesium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	9.57	9.14	10.1	0.27	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	9.7	9.01	10.4	0.44	11	11	0
Manganese (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00923	0.00452	0.0295	0.0071	11	11	1
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.2156	0.00775	0.588	0.1961	11	11	9

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Water Quality Results

Molybdenum (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00347	0.00322	0.00389	0.00024	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.00349	0.00282	0.00537	0.00069	11	11	0
Nickel (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00051	<0.00040	0.00089	0.0002	11	9	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.00064	0.00046	0.00105	0.00019	11	11	0
Selenium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Silicon (total, as Si)	Vaseux Lake 1, 5, 10 m composite	mg/L	2.9	1.8	3.6	0.5	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	4	2.1	5.6	1.2	11	11	0
Silver (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Sodium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	12.4	11.8	12.9	0.3	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	12.9	11.9	16.4	1.2	11	11	0
Strontium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.29	0.266	0.33	0.017	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.302	0.276	0.334	0.014	11	11	0
Sulphur (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	10.5	6.8	13.4	1.8	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	9.5	6.6	15.1	2.6	11	11	0
Tellurium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00027	<0.00050	0.00052	0.00008	11	1	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Thallium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Thorium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Tin (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00013	0.0002	0.00036	0.00008	11	2	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.0003	<0.00020	0.00233	0.00067	11	1	0
Titanium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Tungsten (total)	Vaseux Lake 1, 5, 10 m composite	mg/L					11	0	0
	Vaseux Lake 20, 22, 24 m composite	mg/L					11	0	0
Uranium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.0024	0.00223	0.00255	0.00011	11	11	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.00219	0.00156	0.00256	0.00032	11	11	0
Vanadium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.0007	<0.0010	0.0018	0.0004	11	2	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.0006	<0.0010	0.0019	0.0004	11	1	0
Zinc (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.0037	0.004	0.0069	0.0021	11	5	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.003	<0.0040	0.007	0.0018	11	3	0
Zirconium (total)	Vaseux Lake 1, 5, 10 m composite	mg/L	0.00006	<0.00010	0.00011	0.00002	11	1	0
	Vaseux Lake 20, 22, 24 m composite	mg/L	0.00007	<0.00010	0.00028	0.00007	11	1	0

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Sampling Location		Vaseux Lake	Vaseux Lake	Vaseux Lake	Vaseux Lake	Vaseux Lake	Vaseux Lake	Vaseux Lake	Vaseux Lake	Vaseux Lake
Date Sampled		12-Mar-21	08-Apr-21	10-May-21	03-Jun-21	07-Jul-21	05-Aug-21	03-Sep-21	07-Oct-21	04-Nov-21
Lab Sample ID		S2021-01	S2021-02	S2021-03	S2021-04	S2021-05	S2021-06	S2021-07	S2021-08	S2021-09
Analyte	Unit									
Field Results										
Secchi depth	m	5.2	5.2	3.55	4.8	6.1	7.25	6.8	5.5	5



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Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

		Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite
		12-Mar-21 21C1783-01	08-Apr-21 21D0758-01	10-May-21 21E0984-01	03-Jun-21 21F0621-01	06-Jul-21 21G0445-01	06-Jul-21 21G0445-03	06-Jul-21 21G0445-04	05-Aug-21 21H0575-01	03-Sep-21 21I0553-01	07-Oct-21 21J1096-01	04-Nov-21 21K0702-01
		Normal	Normal	Normal	Normal	Normal	Duplicate	Duplicate	Normal	Normal	Normal	Normal
Analyte	Unit											
Field Results												
Conductivity	µS/cm	291.13	293.6	285.43	283.3	286.7			291.57	295.13	295.7	295.57
Density	kg/m³	1000.113	1000.038	1009.276	999.106	998.245			998.116	998.944	999.401	999.913
Dissolved oxygen	mg/L	13.44	12.41	10.7	9.81	8.17			6.92	5.88	9.47	9.91
Dissolved oxygen (percent)	%	102.8	102.43	99.2	98	90.43			79.57	63.07	91.67	85.97
pH		8.9	8.78	8.66	8.75	8.87			8.57	8.57	8.72	8.74
Salinity		0.14	0.14	0.14	0.13	0.14			0.14	0.14	0.14	0.14
Temperature	°C	4.07	7.07	11.87	15.2	19.6			20.27	17.43	13.87	9.13
Total dissolved solids	mg/L	189.33	191	185.33	184.33	186.33			189.33	192	192	192
Lab Results												
General												
Chloride	mg/L	6.12	6.4	5.83	5.96	5.43	5.42	5.43	5.86	5.91	6.02	5.91
Chlorophyll a	mg/L	0.00194	0.00164	0.00202	0.00107	0.00154			<0.00140	0.00124	0.00204	0.00244
Hardness, Total (total as CaCO3)	mg/L	121	119	121	118	120	116	122	118	120	118	134
Sulphate	mg/L	29.4	29.5	26.8	26.8	28.8	28.2	28.2	28.1	29.3	29.1	28.8
Nutrients												
Ammonia (total, as N)	mg/L	<0.020	<0.020	<0.020	<0.020	0.024	0.029	0.028	0.023	<0.020	0.02	0.026
Nitrate (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate + Nitrite (as N)	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Nitrate + Nitrite (as N) (calculated)	mg/L	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total nitrogen	mg/L	0.207	0.231	0.172	0.443	0.356	0.974	0.273	0.341	0.192	0.244	0.199
Total kjeldahl nitrogen	mg/L	0.207	0.231	0.172	0.443	0.356	0.974	0.273	0.341	0.192	0.244	0.199
Total organic nitrogen	mg/L	0.207	0.231	0.172	0.443	0.332	0.945	0.245	0.318	0.192	0.224	0.173
Orthophosphate (dissolved, as P)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phosphorus (total, by ICPMS/ICPOES)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.061	<0.050	<0.050	<0.050	<0.050
Phosphorus (total, APHA 4500-P)	mg/L	0.0115	0.011	0.0136	0.0119	0.0147	0.0127	0.0123	0.0144	0.0103	0.0107	0.0227
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.005	0.0067	0.0108	0.0074	0.0147	0.0127	0.0123	0.0145	0.0077	0.007	0.0173
Potassium (total)	mg/L	2.57	2.42	2.73	2.35	2.39	2.28	2.41	2.64	2.55	2.6	2.63

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 1, 5, 10 m composite	
		12-Mar-21 21C1783-01	08-Apr-21 21D0758-01	10-May-21 21E0984-01	03-Jun-21 21F0621-01	06-Jul-21 21G0445-01	06-Jul-21 21G0445-03	06-Jul-21 21G0445-04	05-Aug-21 21H0575-01	03-Sep-21 21I0553-01	07-Oct-21 21J1096-01	04-Nov-21 21K0702-01
		Normal	Normal	Normal	Normal	Normal	Duplicate	Duplicate	Normal	Normal	Normal	Normal
Total Metals												
Aluminum (total)	mg/L	0.009	0.0133	0.0432	0.021	0.0159	0.0148	0.0177	0.015	0.0149	0.0114	0.0203
Antimony (total)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Arsenic (total)	mg/L	0.00053	0.00052	0.00052	<0.00050	<0.00050	0.00052	<0.00050	<0.00050	0.0005	<0.00050	0.0005
Barium (total)	mg/L	0.0245	0.0235	0.0253	0.024	0.0238	0.0229	0.0241	0.0231	0.0238	0.0223	0.025
Beryllium (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron (total)	mg/L	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Cadmium (total)	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Calcium (total)	mg/L	32.6	31.5	32.6	32	32.3	31.4	33.2	31.8	31.9	31.4	37.1
Chromium (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (total)	mg/L	0.00086	0.00098	0.0009	0.0009	0.00253	0.00078	0.00094	0.00065	0.00139	0.0009	0.00114
Iron (total)	mg/L	0.019	0.027	0.047	0.035	0.038	0.021	0.031	0.02	0.025	0.027	0.038
Lead (total)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (total)	mg/L	0.00376	0.00328	0.00355	0.00332	0.00327	0.00317	0.00331	0.00359	0.00358	0.00335	0.00364
Magnesium (total)	mg/L	9.72	9.85	9.65	9.22	9.46	9.14	9.51	9.41	9.7	9.56	10.1
Manganese (total)	mg/L	0.00757	0.00736	0.00953	0.00728	0.0058	0.00559	0.00613	0.0127	0.00555	0.00452	0.0295
Molybdenum (total)	mg/L	0.00364	0.00332	0.00344	0.00322	0.00389	0.00354	0.00387	0.00323	0.00343	0.00323	0.00336
Nickel (total)	mg/L	0.00066	0.00089	0.0005	0.00062	0.00062	0.00047	0.00059	<0.00040	<0.00040	0.00044	0.00047
Selenium (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon (total, as Si)	mg/L	2.5	1.8	2.9	2.8	2.9	2.7	2.9	3.4	3.3	2.8	3.6
Silver (total)	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Sodium (total)	mg/L	12.2	12.5	12.4	11.8	12.3	11.8	12.3	12.9	12.5	12.6	12.6
Strontium (total)	mg/L	0.33	0.282	0.281	0.291	0.28	0.266	0.28	0.302	0.288	0.28	0.305
Sulphur (total)	mg/L	13.4	10	9.3	10.5	10.6	9.1	6.8	10.2	12.2	11.8	12
Tellurium (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	<0.00050	<0.00050	<0.00050	<0.00050
Thallium (total)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Thorium (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (total)	mg/L	<0.00020	0.00036	<0.00020	<0.00020	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Titanium (total)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (total)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (total)	mg/L	0.00245	0.00251	0.00255	0.00248	0.00234	0.00232	0.00235	0.00229	0.00238	0.00223	0.00252
Vanadium (total)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	0.0013
Zinc (total)	mg/L	<0.0040	0.0062	<0.0040	0.0067	0.0069	0.004	0.0045	<0.0040	<0.0040	<0.0040	<0.0040
Zirconium (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010



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Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

		Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite
		12-Mar-21	08-Apr-21	10-May-21	03-Jun-21	06-Jul-21	06-Jul-21	06-Jul-21	05-Aug-21	03-Sep-21	07-Oct-21	04-Nov-21
		21C1783-02	21D0758-02	21E0984-02	21F0621-02	21G0445-02	21G0445-05	21G0445-06	21H0575-02	21I0553-02	21J1096-02	21K0702-02
		Normal	Normal	Normal	Normal	Normal	Duplicate	Duplicate	Normal	Normal	Normal	Normal
Analyte	Unit											
Field Results												
Conductivity	µS/cm	292.03	293.93	296.43	297.13	296.4			297.63	299.67	302.07	296.93
Density	kg/m³	1000.113	1000.077	1005.853	1000.004	999.98			999.971	999.969	999.968	999.956
Dissolved oxygen	mg/L	13.33	12	8.94	5.68	1.31			-0.15	-0.19	-0.17	9.65
Dissolved oxygen (percent)	%	101.6	96.7	74.5	47.73	11.1			-1.23	-1.6	-1.43	82.63
pH		8.81	8.68	8.21	7.95	7.73			7.83	7.75	7.72	8.56
Salinity		0.14	0.14	0.14	0.14	0.14			0.14	0.14	0.15	0.14
Temperature	°C	3.93	6.1	7.43	7.73	8.13			8.27	8.33	8.5	8.57
Total dissolved solids	mg/L	190	191	192.67	193	192.67			193.67	195	196.33	193
Lab Results												
General												
Chloride	mg/L	6.14	6.32	6.02	6.3	5.67	5.65	5.66	5.8	5.94	6.01	5.91
Chlorophyll a	mg/L	0.00235	0.00221	<0.00100	0.00171	0.00064			<0.00100	0.00032	<0.00100	0.00137
Hardness, Total (total as CaCO3)	mg/L	125	124	116	124	128	133	124	121	124	117	133
Sulphate	mg/L	29.4	30	26.8	27.7	27	27.1	27.1	25.4	25	24.1	28.9
Nutrients												
Ammonia (total, as N)	mg/L	<0.020	<0.020	<0.020	0.048	0.073	0.073	0.078	0.088	0.185	0.327	0.041
Nitrate (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	0.055	0.056	0.056	0.094	0.022	<0.010	<0.010
Nitrate + Nitrite (as N)	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	0.0554	0.0565	0.056	0.0944	0.0221	<0.0100	<0.0100
Nitrate + Nitrite (as N) (calculated)	mg/L	<0.014	<0.014	<0.014	<0.014	0.055	0.056	0.056	0.094	0.022	<0.014	<0.014
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total nitrogen	mg/L	0.23	0.21	0.2	0.24	1.03	0.488	0.36	0.487	0.353	0.512	0.233
Total kjeldahl nitrogen	mg/L	0.23	0.21	0.2	0.24	0.975	0.432	0.304	0.393	0.331	0.512	0.233
Total organic nitrogen	mg/L	0.23	0.21	0.2	0.192	0.902	0.359	0.226	0.305	0.146	0.185	0.192
Orthophosphate (dissolved, as P)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.017	0.0646	0.0416	<0.0050
Phosphorus (total, by ICPMS/ICPOES)	mg/L	<0.050	<0.050	<0.050	<0.050	0.097	0.06	0.062	0.072	0.114	0.235	<0.050
Phosphorus (total, APHA 4500-P)	mg/L	0.0115	0.0171	0.0637	0.0282	0.0495	0.0417	0.0432	0.0656	0.132	0.192	0.0289
Phosphorus (dissolved, APHA 4500-P)	mg/L	0.0063	0.0067	0.0104	0.0097	0.0246	0.0243	0.0251	0.0396	0.0732	0.161	0.0184
Potassium (total)	mg/L	2.73	2.54	2.63	2.55	2.54	2.65	2.52	2.67	2.63	2.42	2.59

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Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite	Vaseux Lake 20, 22, 24 m composite
		12-Mar-21 21C1783-02	08-Apr-21 21D0758-02	10-May-21 21E0984-02	03-Jun-21 21F0621-02	06-Jul-21 21G0445-02	06-Jul-21 21G0445-05	06-Jul-21 21G0445-06	05-Aug-21 21H0575-02	03-Sep-21 21I0553-02	07-Oct-21 21J1096-02	04-Nov-21 21K0702-02
		Normal	Normal	Normal	Normal	Normal	Duplicate	Duplicate	Normal	Normal	Normal	Normal
Total Metals												
Aluminum (total)	mg/L	0.0106	0.0502	0.0348	0.0653	0.0172	0.0154	0.0169	0.0493	0.0404	0.0553	0.0424
Antimony (total)	mg/L	<0.00020	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Arsenic (total)	mg/L	0.0006	0.0006	0.00052	0.00057	0.0006	0.00066	0.00063	0.00061	0.00085	0.00076	0.00061
Barium (total)	mg/L	0.0252	0.0243	0.0251	0.0282	0.0263	0.0278	0.0273	0.0241	0.0254	0.0237	0.027
Beryllium (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron (total)	mg/L	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Cadmium (total)	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Calcium (total)	mg/L	32.9	32.8	31	33.8	35	36.6	34.1	33.3	33.6	32	36.9
Chromium (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (total)	mg/L	0.00088	0.00104	0.00074	0.00067	0.00063	0.00079	0.00057	0.0004	0.00067	0.00041	0.00071
Iron (total)	mg/L	0.02	0.07	0.066	0.178	0.261	0.272	0.258	0.284	0.433	0.875	0.085
Lead (total)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (total)	mg/L	0.0037	0.00354	0.00329	0.00348	0.00327	0.00351	0.00328	0.00366	0.00356	0.00303	0.00359
Magnesium (total)	mg/L	10.4	10.3	9.33	9.58	9.75	10	9.54	9.15	9.75	9.01	9.92
Manganese (total)	mg/L	0.00775	0.0151	0.0248	0.107	0.248	0.257	0.246	0.355	0.47	0.588	0.053
Molybdenum (total)	mg/L	0.0035	0.00347	0.00326	0.00537	0.00341	0.00377	0.00334	0.00288	0.00304	0.00282	0.00354
Nickel (total)	mg/L	0.00071	0.0006	0.00052	0.00094	0.00052	0.00059	0.00052	0.00049	0.00046	0.00068	0.00105
Selenium (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon (total, as Si)	mg/L	2.7	2.1	2.8	3.2	4.3	4.6	4.4	4.8	5.6	5.4	3.6
Silver (total)	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Sodium (total)	mg/L	13.1	12.8	11.9	12.2	12.5	12.9	12.3	12.6	12.4	16.4	12.4
Strontium (total)	mg/L	0.334	0.296	0.276	0.305	0.295	0.307	0.295	0.306	0.305	0.3	0.299
Sulphur (total)	mg/L	15.1	12.2	8.8	9	6.6	7.9	7.1	8.3	11.2	7.3	10.5
Tellurium (total)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium (total)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Thorium (total)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (total)	mg/L	<0.00020	0.00233	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Titanium (total)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (total)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (total)	mg/L	0.00239	0.00256	0.00239	0.00255	0.00216	0.00223	0.00204	0.00189	0.00189	0.00156	0.00247
Vanadium (total)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0019
Zinc (total)	mg/L	<0.0040	<0.0040	<0.0040	0.0057	<0.0040	<0.0040	0.0041	<0.0040	<0.0040	<0.0040	0.007
Zirconium (total)	mg/L	<0.00010	<0.00010	<0.00010	0.00028	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010



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Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Analyte	Unit	Guideline														
		BCAWQG AL (LT)	BCWWQG AL	BCAWQG AL (ST)	GCDWQ MAC	GCDWQ AO	BCAWQG L	BCWWQG L	BCAWQG I	BCWWQG I	BC SDWOG MAC	BC SDWOG AO	CSR AW	CSR IW	CSR LW	CSR DW
Field Results																
Conductivity	µS/cm	NG	NG	NG	NG	NG	NG	NG	NG	700 ^{9.1}	NG	NG	NG	NG	NG	NG
Density	kg/m³	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Dissolved oxygen	mg/L	min 8 ^{1.1}	NG	min 5 ^{3.1}	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Dissolved oxygen (percent)	%	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
pH		N ^{1.2}	NG	NG	NG	7.0 - 10.5 _{5.1}	5.0 - 9.5 ^{6.1}	NG	5.0 - 9.5 ^{8.1}	NG	NG	NG	NG	NG	NG	NG
Salinity		NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	15 ^{12.1}	NG	NG	NG
Secchi depth	m	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Temperature	°C	NG	NG	19 ^{3.2}	NG	15	N ^{6.2}	NG	N ^{8.2}	NG	NG	15	NG	NG	NG	NG
Total dissolved solids	mg/L	NG	NG	NG	NG	500	NG	1000 ^{7.1}	NG	500 ^{9.2}	NG	NG	NG	NG	NG	NG
Lab Results																
General																
Chloride	mg/L	150 ^{1.3}	NG	600 ^{3.3}	NG	250	600 ^{6.3}	NG	100	NG	NG	250	1500	100 ^{13.1}	600	250 ^{15.1}
Chlorophyll a	mg/L	NG	NG	N ^{3.4}	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Hardness, Total (total as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Sulphate	mg/L	Calc ^{1.4}	NG	NG	NG	500 ^{5.2}	1000	1000 ^{7.2}	NG	NG	NG	500	Calc ^{12.2}	NG	1000	500 ^{15.2}
Nutrients																
Ammonia (total, as N)	mg/L	Calc ^{1.5}	NG	Calc ^{3.5}	NG	NG	NG	NG	NG	NG	NG	NG	Calc ^{12.3}	NG	NG	NG
Nitrate (as N)	mg/L	3.0 ^{1.6}	NG	32.8 ^{3.6}	10	NG	100 ^{6.4}	NG	NG	NG	10	NG	400 ^{12.4}	NG	100 ^{14.1}	10 ^{15.3}
Nitrate + Nitrite (as N)	mg/L	NG	NG	NG	10 ^{4.1}	NG	100 ^{6.5}	NG	NG	NG	NG	NG	400 ^{12.5}	NG	100 ^{14.2}	10 ^{15.4}
Nitrate + Nitrite (as N) (calculated)	mg/L	NG	NG	NG	10 ^{4.2}	NG	100 ^{6.6}	NG	NG	NG	NG	NG	400 ^{12.6}	NG	100 ^{14.3}	10 ^{15.5}
Nitrite (as N)	mg/L	Calc ^{1.7}	NG	Calc ^{3.7}	1	NG	10 ^{6.7}	NG	NG	NG	1.0	NG	Calc ^{12.7}	NG	10.000	1
Total nitrogen	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Total kjeldahl nitrogen	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Total organic nitrogen	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Orthophosphate (dissolved, as P)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Phosphorus (total, by ICPMS/ICPOES)	mg/L	N ^{1.8}	NG	NG	NG	NG	NG	NG	NG	NG	NG	N ^{11.1}	NG	NG	NG	NG
Phosphorus (total, APHA 4500-P)	mg/L	N ^{1.9}	NG	NG	NG	NG	NG	NG	NG	NG	NG	N ^{11.2}	NG	NG	NG	NG
Phosphorus (dissolved, APHA 4500-P)	mg/L	N ^{1.10}	NG	NG	NG	NG	NG	NG	NG	NG	NG	N ^{11.3}	NG	NG	NG	NG
Potassium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG

Appendix S

Okanagan Falls Advanced Wastewater Treatment Facility
Water Quality Results

Analyte	Unit	Guideline														
		BCAWQG AL (LT)	BCWWQG AL	BCAWQG AL (ST)	GCDWQ MAC	GCDWQ AO	BCAWQG L	BCWWQG L	BCAWQG I	BCWWQG I	BC SDWQG MAC	BC SDWQG AO	CSR AW	CSR IW	CSR LW	CSR DW
Total Metals																
Aluminum (total)	mg/L	NG	NG	NG	2.9 ^{4.3}	0.100 ^{5.3}	5 ^{6.8}	NG	5 ^{8.3}	NG	9.5	NG	NG	5.000	5.000	9.500 ^{15.6}
Antimony (total)	mg/L	NG	0.009 ^{2.1}	NG	0.006	NG	NG	NG	NG	NG	0.006	NG	0.090	NG	NG	0.006
Arsenic (total)	mg/L	0.005 ^{1.11}	NG	NG	0.010 ^{4.4}	NG	0.025 ^{6.9}	NG	0.100 ^{8.4}	NG	0.01	NG	0.050	0.100	0.025	0.010
Barium (total)	mg/L	NG	1	NG	2.0 ^{4.5}	NG	NG	NG	NG	NG	NG	NG	10.000	NG	NG	1.000
Beryllium (total)	mg/L	NG	0.00013	NG	NG	NG	NG	0.100	NG	0.100	NG	NG	0.0015	0.100	0.100	0.008
Bismuth (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Boron (total)	mg/L	1.2 ^{1.12}	NG	NG	5	NG	5	NG	0.5 ^{8.5}	NG	5.0	NG	12.000	0.500 ^{13.2}	5.000	5.000
Cadmium (total)	mg/L	NG	NG	NG	0.007 ^{4.6}	NG	NG	0.080 ^{7.3}	NG	0.0051 ^{9.3}	0.005	NG	Calc ^{12.8}	0.005	0.080	0.005
Calcium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	1000	NG
Chromium (total)	mg/L	NG	0.001 ^{2.2}	NG	0.05	NG	NG	0.050 ^{7.4}	NG	0.0049 ^{9.4}	0.05	NG	0.010 ^{12.9}	0.005 ^{13.3}	0.050 ^{14.4}	0.050 ^{15.7}
Cobalt (total)	mg/L	0.004 ^{1.13}	NG	0.110 ^{3.8}	NG	NG	NG	1	NG	0.050 ^{9.5}	0.001	NG	0.040	0.050	1.000	0.001
Copper (total)	mg/L	NG	NG	NG	2 ^{4.7}	1	0.300	NG	0.200 ^{8.6}	NG	2.0 ^{10.1}	1.0	Calc ^{12.10}	0.200	0.300	1.500 ^{15.8}
Iron (total)	mg/L	NG	NG	1 ^{3.9}	NG	0.3	NG	NG	NG	NG	NG	0.3	NG	5.000 ^{13.4}	NG	6.500 ^{15.9}
Lead (total)	mg/L	Calc ^{1.14}	NG	Calc ^{3.10}	0.005 ^{4.8}	NG	0.100	NG	0.200 ^{8.7}	NG	0.005	NG	Calc ^{12.11}	0.200	0.100	0.010
Lithium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	0.75 ^{9.6}	NG	NG	NG	2.500 ^{13.5}	5.000	0.008
Magnesium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Manganese (total)	mg/L	Calc ^{1.15}	NG	Calc ^{3.11}	0.12 ^{4.9}	0.02 ^{5.4}	NG	NG	NG	0.200	0.12	0.02	NG	0.200 ^{13.6}	NG	1.500 ^{15.10}
Molybdenum (total)	mg/L	7.6	NG	46	NG	NG	0.016 ^{6.10}	NG	0.01 ^{8.8}	NG	0.088	NG	10.000	0.010 ^{13.7}	0.050	0.250
Nickel (total)	mg/L	NG	Calc ^{2.3}	NG	NG	NG	NG	1	NG	0.200	0.08	NG	Calc ^{12.12}	0.200	1.000	0.080
Selenium (total)	mg/L	0.002 ^{1.16}	NG	NG	0.05	NG	0.0300 ^{6.11}	NG	0.010 ^{8.9}	NG	0.01	NG	0.020	0.020 ^{13.8}	0.030	0.010
Silicon (total, as Si)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Silver (total)	mg/L	Calc ^{1.17}	NG	Calc ^{3.12}	NG	NG	NG	NG	NG	NG	NG	NG	Calc ^{12.13}	NG	NG	0.020
Sodium (total)	mg/L	NG	NG	NG	NG	200	NG	NG	NG	NG	NG	NG	NG	NG	NG	200 ^{15.11}
Strontium (total)	mg/L	NG	NG	NG	7.0 ^{4.10}	NG	NG	NG	NG	NG	7.0	NG	NG	NG	NG	2.500
Sulphur (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Tellurium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Thallium (total)	mg/L	NG	0.0008 ^{2.4}	NG	NG	NG	NG	NG	NG	NG	NG	NG	0.003	NG	NG	NG
Thorium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
Tin (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	2.500
Titanium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	1.000	NG	NG	NG
Tungsten (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	0.003
Uranium (total)	mg/L	NG	0.0085	NG	0.02	NG	NG	0.200	NG	0.010	0.02	NG	0.085	0.010	0.200	0.020
Vanadium (total)	mg/L	NG	NG	NG	NG	NG	NG	0.100	NG	0.100	NG	NG	NG	0.100	0.100	0.020
Zinc (total)	mg/L	Calc ^{1.18}	NG	Calc ^{3.13}	NG	5.0	2.000	NG	1.000 ^{8.10}	NG	3.0	5.0	Calc ^{12.14}	1.000 ^{13.9}	2.000	3.000 ^{15.12}
Zirconium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG



1. Notes for BC Approved Water Quality Guidelines for freshwater aquatic life (Long-term chronic) (BCAWQG AL (LT))**General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports. / There are two types of water quality guidelines: the short-term acute guideline (i.e. maximum), and the long-term chronic guideline (i.e. average). Only the long-term chronic guidelines are included in this criteria set.

Note 1.1 for Dissolved oxygen:

The aquatic life long-term chronic guideline (minimum) for dissolved oxygen is 8 mg/L for all life stages other than buried embryo/alevin. The 30-day mean guideline (minimum) for dissolved oxygen in the water column is 11 mg/L for buried embryo/alevin. The 30-day mean guideline (minimum) for dissolved oxygen in interstitial water is 8 mg/L for buried embryo/alevin.

Note 1.2 for pH:

The freshwater aquatic life long-term chronic guideline is:

pH less than 6.5: No statistically significant decrease in pH from background;

pH from 6.5 to 9.0: Unrestricted change permitted within this range;

pH over 9.0: No statistically significant increase in pH from background.

See BC MOE Overview Report for additional details.

Note 1.3 for Chloride:

To protect freshwater aquatic life from chronic effects, the average (arithmetic mean computed from five weekly samples collected over a 30-day period) concentration of chloride (mg/L as NaCl) should not exceed 150 mg/L. When ambient chloride concentrations exceed guidelines, increases in chloride due to human activities should be avoided.

Note 1.4 for Sulphate:

The freshwater aquatic life long-term chronic guideline is:

128 mg/L at hardness of 0 to 30 mg/L as CaCO₃

218 mg/L at hardness of 31 to 75 mg/L as CaCO₃

309 mg/L at hardness of 76 to 180 mg/L as CaCO₃

429 mg/L at hardness 181 to 250 mg/L as CaCO₃

Need to determine guideline based on site water for hardness greater than 250 mg/L as CaCO₃.

For screening purposes in this report, exceedance were flagged for sulphate greater than 429 mg/L at hardness greater than 250 mg/L as CaCO₃.

Note 1.5 for Ammonia (total, as N):

The freshwater aquatic life long-term chronic guideline for ammonia varies as a function of pH and temperature. See Table 4 in Overview Report Update September 2009. / The lab pH and field temperature results were used for determining the maximum ammonia concentration for this report. If a lab pH result was not available then the field pH result was used.

Note 1.6 for Nitrate (as N):

Freshwater aquatic life long-term chronic guideline.

Note 1.7 for Nitrite (as N):

The freshwater aquatic life long-term chronic guideline for nitrite as N is:

0.02 mg/L if chloride less than 2 mg/L

0.04 mg/L if chloride is 2 to 4 mg/L

0.06 mg/L if chloride is 4 to 6 mg/L

0.08 mg/L if chloride is 6 to 8 mg/L

0.10 mg/L if chloride is 8 to 10 mg/L

0.20 mg/L if chloride is greater than 10 mg/L.

Note 1.8 for Phosphorus (total, by ICPMS/ICPOES):

Streams: None proposed for streams.

Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

Note 1.9 for Phosphorus (total, APHA 4500-P):

Streams: None proposed for streams.

Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

Note 1.10 for Phosphorus (dissolved, APHA 4500-P):

Streams: None proposed for streams.

Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

Note 1.11 for Arsenic (total):

Freshwater aquatic life long-term chronic guideline.

Note 1.12 for Boron (total):

Aquatic life long-term chronic guideline.

Note 1.13 for Cobalt (total):

Freshwater aquatic life long-term chronic guideline.

Note 1.14 for Lead (total):

The freshwater aquatic life long-term chronic guideline for total lead in water is: when water hardness exceeds 8 mg/L as CaCO₃, the guideline is less than or equal to $3.31 + \exp(1.273 \ln(\text{mean hardness}) - 4.704)$. In addition, no more than 20% (e.g. 1 in 5) of values in a 30-day period should exceed 1.5 times the long-term chronic guideline.

The guideline applies to water hardness between 8 – 360 mg/L (as CaCO₃). If natural levels exceed the guideline, then any allowed increase in total lead above natural levels should be based on site-specific data. When water hardness exceeds highest hardness tested (i.e. upper bound), a site-specific assessment may be required.

For hardness less than or equal to 8 mg/L there is no long-term chronic guideline. The short-term acute guideline of 3.0 µg/L is used for this case.

Note 1.15 for Manganese (total):

The freshwater aquatic life long-term chronic guideline for total manganese in mg/L is determined by the following relationship:

$$0.0044 \text{ hardness} + 0.605$$

where water hardness is reported as mg/L of CaCO₃.

The guideline applies to water hardness between 37 – 450 mg/L CaCO₃. When water hardness is outside hardness range tested (i.e. lower or upper bound), a site-specific assessment may be required.

Note 1.16 for Selenium (total):

Aquatic life long-term chronic guideline. The 30-day average water quality guideline for protection of aquatic life is 2 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.

Note 1.17 for Silver (total):

The freshwater aquatic life long-term chronic guideline for total silver is:

0.05 µg/L as 30-day mean if hardness less than or equal to 100 mg/L

1.5 µg/L as 30-day mean if hardness greater than 100 mg/L.

Note 1.18 for Zinc (total):

The freshwater aquatic life long-term chronic guideline for total zinc (µg/L) at any time should not exceed 7.5 µg/L when water hardness is less than or equal to 90 mg/L as CaCO₃.

When water hardness is less than or equal to 90 mg/L as CaCO₃ the guideline is 7.5 µg/L;

When water hardness exceeds 90 mg/L CaCO₃, the guideline in µg/L for total zinc is the value determined by the following relationship:

$$7.5 + 0.75 * (\text{hardness} - 90)$$

where water hardness is reported as mg/L of CaCO₃.

The long-term chronic guideline formula applies to water hardness between 90 – 330 mg/L CaCO₃.

2. Notes for BC Working Water Quality Guidelines for Freshwater Aquatic Life (2020) (BCWWQG AL)**General Notes:**

Reference: B.C. Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (2021). WWQG values are long-term (i.e. average) concentrations unless identified as a short-term maximum in the “Notes” for a specific analyte. Long-term WWQGs represent average substance concentrations calculated from 5 samples in 30 days. WWQG are given for total substance concentrations unless otherwise noted.

Note 2.1 for Antimony (total):

The guideline is for antimony (III).

Note 2.2 for Chromium (total):

The guideline for Cr(VI) is 1 µg/L (total). The guideline for Cr(III) is 8.9 µg/L (total). The guideline of 1 µg/L for Cr(VI) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 2.3 for Nickel (total):

The guideline for nickel in µg/L is determined as follows:

When the water hardness is 0 to ≤ 60 mg/L, the maximum is 25 µg/L

At hardness > 60 to ≤ 180 mg/L the maximum is calculated using the equation:

$$e \text{ raised to the power of } \{0.76[\ln(\text{hardness})] + 1.06\}$$

At hardness >180 mg/L, the maximum is 150 µg/L

Where water hardness is reported as mg/L CaCO₃.

If the water hardness is unknown, the maximum is 25 µg/L.

Note 2.4 for Thallium (total):

30-day average, site-specific objective for the lower Columbia River, BC

3. Notes for BC Approved Water Quality Guidelines for freshwater aquatic life (Short-term acute) (BCAWQG AL (ST))**General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports. / There are two types of water quality guidelines: the short-term acute guideline (i.e. maximum), and the long-term chronic guideline (i.e. average). Only the short-term acute guidelines are included in this criteria set.

Note 3.1 for Dissolved oxygen:

The aquatic life instantaneous minimum guideline for dissolved oxygen is 5 mg/L for all life stages other than buried embryo/alevin. The instantaneous minimum guideline for dissolved oxygen in the water column is 9 mg/L for buried embryo/alevin. The instantaneous minimum guideline for dissolved oxygen in interstitial water is 6 mg/L for buried embryo/alevin.

Note 3.2 for Temperature:

The freshwater aquatic life guideline for streams with unknown fish distribution is:

Maximum daily temperature of 19 degrees Celsius;

MWMT = 18 degrees Celsius. (MWMT, mean weekly short-term temperature, is defined as the average of the warmest daily short-term temperatures for 7 consecutive days;

Hourly rate of change not to exceed 1 degree Celsius;

Short-term incubation temperature = 12 degrees Celsius (in spring and fall).

See BC MOE Overview Report for additional details for streams with unknown fish distribution, and specific guidelines for streams with known fish distribution, and guideline for lakes and impoundments.

Note 3.3 for Chloride:

To protect freshwater aquatic life from acute and lethal effects, the maximum concentration of chloride (mg/L as NaCl) at any time should not exceed 600 mg/L. When ambient chloride concentrations exceed guidelines, increases in chloride due to human activities should be avoided.

Note 3.4 for Chlorophyll a:

Freshwater aquatic life short-term acute guideline. For protection of aquatic life in streams, a maximum biomass of 100 mg/m² chlorophyll a is suggested. This guideline applies to naturally growing periphytic algae. There is no guideline for chlorophyll a for lakes.

Note 3.5 for Ammonia (total, as N):

The freshwater aquatic life short-term acute guideline for ammonia varies as a function of pH and temperature. See Table 3 in Overview Report Update September 2009. / The lab pH and field temperature results were used for determining the maximum ammonia for this report. If a lab pH result was not available then the field pH result was used.

Note 3.6 for Nitrate (as N):

Freshwater aquatic life short-term acute guideline.

Note 3.7 for Nitrite (as N):

The freshwater aquatic life short-term acute guideline for nitrite as N is:

0.06 mg/L if chloride less than 2 mg/L

0.12 mg/L if chloride is 2 to 4 mg/L

0.18 mg/L if chloride is 4 to 6 mg/L

0.24 mg/L if chloride is 6 to 8 mg/L

0.30 mg/L if chloride is 8 to 10 mg/L

0.60 mg/L if chloride is greater than 10 mg/L.

Note 3.8 for Cobalt (total):

Freshwater aquatic life short-term acute guideline.

Note 3.9 for Iron (total):

Freshwater aquatic life short-term acute guideline.

Note 3.10 for Lead (total):

The freshwater aquatic life short-term acute guideline for total lead in water, at a water hardness less than or equal to 8 mg/L as CaCO₃ is 3 µg/L. When water hardness exceeds 8 mg/L (as CaCO₃) the short-term acute guideline (µg/L) is given by the following equation: $\exp(1.273 \ln(\text{hardness}) - 1.460)$.

The guideline applies to water hardness up to 360 mg/L (as CaCO₃). If natural levels exceed the guideline, then any allowed increase in total lead above natural levels should be based on site-specific data. When water hardness exceeds highest hardness tested (i.e. upper bound), a site-specific assessment may be required.

Note 3.11 for Manganese (total):

The freshwater aquatic life short-term acute guideline for total manganese in mg/L is determined by the following relationship:

$0.01102 \text{ hardness} + 0.54$

where water hardness is reported as mg/L of CaCO₃.

The guideline applies to water hardness between 25 – 259 mg/L CaCO₃. When water hardness is outside hardness range tested (i.e. lower or upper bound), a site-specific assessment may be required.

Note 3.12 for Silver (total):

The freshwater aquatic life short-term acute guideline for total silver is:

0.1 µg/L maximum if hardness less than or equal to 100 mg/L

3.0 µg/L maximum if hardness greater than 100 mg/L.

Note 3.13 for Zinc (total):

The freshwater aquatic life short-term acute guideline for total zinc (µg/L) is:

When water hardness is less than or equal to 90 mg/L as CaCO₃ the guideline is 33 µg/L;

When water hardness exceeds 90 mg/L CaCO₃, the guideline in µg/L for total zinc is the value determined by the following relationship:

$33 + 0.75 * (\text{hardness} - 90)$

where water hardness is reported as mg/L of CaCO₃.

The short-term acute guideline formula applies to water hardness between 90 – 500 mg/L CaCO₃.

4. Notes for Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations (GCDWQ MAC)**Note 4.1 for Nitrate + Nitrite (as N):**

The MAC for Nitrate (as N) is 10 mg/L

Note 4.2 for Nitrate + Nitrite (as N) (calculated):

The MAC for Nitrate (as N) is 10 mg/L

Note 4.3 for Aluminum (total):

The maximum acceptable concentration (MAC) for total aluminum in drinking water is 2.9 mg/L (2 900 µg/L) based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. (Update March 5, 2021)

Note 4.4 for Arsenic (total):

Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 4.5 for Barium (total):

Update January 24, 2020. The MAC was revised from 1.0 mg/L to 2.0 mg/L.

Note 4.6 for Cadmium (total):

A maximum acceptable concentration (MAC) of 0.007 mg/L (7 µg/L) is established for total cadmium in drinking water, based on a sample of water taken at the tap. (Update July 14, 2020)

Note 4.7 for Copper (total):

A maximum acceptable concentration (MAC) of 2 mg/L is established for total copper in drinking water, based on a sample of water taken at the tap. Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on Copper, June 2019.

Note 4.8 for Lead (total):

The maximum acceptable concentration (MAC) for total lead in drinking water is 0.005 mg/L (5 µg/L), based on a sample of water taken at the tap and using the appropriate protocol for the type of building being sampled. Every effort should be made to maintain lead levels in drinking water as low as reasonably achievable (or ALARA). (GCDWQ: Guideline Technical Document; March, 2019)

Note 4.9 for Manganese (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

Note 4.10 for Strontium (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on strontium, May 2019.

5. Notes for Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO)**Note 5.1 for pH:**

The operational guideline for pH is a range of 7.0 to 10.5 in finished drinking water.

Note 5.2 for Sulphate:

There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L. Health authorities should be notified of drinking water sources containing above 500 mg/L.

Note 5.3 for Aluminum (total):

The operational guidance (OG) value for total aluminum in drinking water is 0.100 mg/L (100 µg/L) to optimize water treatment and distribution system operations. This value is based on a locational running annual average. The sampling frequency required to calculate the locational running annual average will vary based on the type of treatment facility and the sampling location. (Update March 5, 2021)

Note 5.4 for Manganese (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

6. Notes for BC Approved Water Quality Guidelines for livestock (BCAWQG L)**General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports.

Note 6.1 for pH:

Update August 2019 Summary Report.

Note 6.2 for Temperature:

The recommended guideline for temperature is + or - 1 degree Celsius change from natural ambient background.

Note 6.3 for Chloride:

The water quality guideline for chloride for livestock watering is 600 mg/L.

Note 6.4 for Nitrate (as N):

Overview Report Update, September 2009.

Note 6.7 for Nitrite (as N):

Overview Report Update, September 2009.

Note 6.8 for Aluminum (total):

The guideline maximum for total aluminum is 5 mg/L. A separate guideline for dissolved aluminum is not provided.

Note 6.9 for Arsenic (total):

The interim guideline for total arsenic is 25 µg/L.

Note 6.10 for Molybdenum (total):

Interim guidelines for total molybdenum are based on differences in sensitivity to molybdenum exposure: 1) ruminant livestock, 0.016 mg/L; and 2) non-ruminant livestock: 0.284 mg/L. The most stringent guideline (0.016 mg/L for ruminant livestock) has been used.

Note 6.11 for Selenium (total):

The guideline for total selenium is 30.0 µg/L mean. The mean concentrations in the water column are based on at least 5 weekly samples taken over a 30-day period.

7. Notes for BC Working Water Quality Guidelines for Livestock (2020) (BCWWQG L)**General Notes:**

Reference: B.C. Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (2021). WWQG values are long-term (i.e. average) concentrations unless identified as a short-term maximum in the "Notes" for a specific analyte. Long-term WWQGs represent average substance concentrations calculated from 5 samples in 30 days. WWQG are given for total substance concentrations unless otherwise noted.

Note 7.1 for Total dissolved solids:

The guideline is 1,000-3,000 mg/L, and is species dependent. Maximum of 1000 mg/L is relatively low level of salinity; excellent for all classes of livestock. TDS between 1000 and 3000 mg/L is satisfactory for all classes of livestock and poultry, but some loss in productivity should be anticipated: may cause temporary and mild diarrhoea in livestock not accustomed to them or watery droppings in poultry. / The most stringent guideline was used in this report.

Note 7.2 for Sulphate:

The guideline is for dissolved sulphate.

Note 7.3 for Cadmium (total):

This is a Short-term maximum guideline.

Note 7.4 for Chromium (total):

The guideline for Cr(VI) is 50 µg/L (total). The guideline for Cr(III) is 50 µg/L (total). The guideline of 50 µg/L for Cr(VI), and for Cr(III) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

8. Notes for BC Approved Water Quality Guidelines for irrigation (BCAWQG I)**General Notes:**

References: B.C. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report (August 2019); and B.C. Guideline Overview and Technical Reports.

Note 8.1 for pH:

Update August 2019 Summary Report.

Note 8.2 for Temperature:

The recommended guideline for temperature is + or - 1 degree Celsius change from natural ambient background.

Note 8.3 for Aluminum (total):

The guideline maximum for total aluminum is 5 mg/L. A separate guideline for dissolved aluminum is not provided.

Note 8.4 for Arsenic (total):

The interim guideline for total arsenic is 100 µg/L.

Note 8.5 for Boron (total):

The guideline for total boron depends on the crop, and varies from 0.5 mg/L to 6 mg/L. The most stringent guideline maximum of 0.5 mg/L, for very sensitive and sensitive crops, was used to identify exceedances for this report.

Note 8.6 for Copper (total):

The guideline maximum for total copper is 200 µg/L.

Note 8.7 for Lead (total):

For neutral and alkaline fine-textured soils the total lead concentration in irrigation water should not exceed 400 µg/L at any time. The concentration of total lead in irrigation water for use on all other soils should not exceed 200 µg/L at any time. / The most stringent guideline maximum was used in this report.

Note 8.8 for Molybdenum (total):

The long-term chronic guidelines for total molybdenum are as follows:

Forage crops-poorly drained soil: 0.01 mg/L

Forage crops-well drained soil: 0.02 mg/L

Non-forage crops: 0.028 mg/L. This guideline is intended to be protective of terrestrial plants and is not necessarily protective of livestock consuming these plants.

The most stringent guideline (0.01 mg/L for irrigation of forage crops-poorly drained soil) has been used.

Note 8.9 for Selenium (total):

The guideline for total selenium is 10 µg/L mean. The mean concentrations in the water column are based on at least 5 weekly samples taken over a 30-day period.

Note 8.10 for Zinc (total):

The guideline maximum for total zinc for irrigation is as follows:

- Soil pH less than 6: 1000 µg/L.

- Soil pH equal to or greater than 6, and less than 7: 2000 µg/L.

- Soil pH greater than or equal to 7: 5000 µg/L. / The most stringent guideline maximum was used in this report.

9. Notes for BC Working Water Quality Guidelines for Irrigation (2020) (BCWWQG I)**General Notes:**

Reference: B.C. Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (2021). WWQG values are long-term (i.e. average) concentrations unless identified as a short-term maximum in the "Notes" for a specific analyte. Long-term WWQGs represent average substance concentrations calculated from 5 samples in 30 days. WWQG are given for total substance concentrations unless otherwise noted.

Note 9.1 for Conductivity:

The guideline varies from 700 to 5000 µS/cm depending on the type of crop. The most stringent guideline has been used for this report.

Note 9.2 for Total dissolved solids:

The guideline varies from 500 to 3500 mg/L depending on the type of crop. The most stringent guideline has been used for this report.

Note 9.3 for Cadmium (total):

This is a Short-term maximum guideline.

Note 9.4 for Chromium (total):

The guideline for Cr(VI) is 8 µg/L (total).

The guideline for Cr(III) is 4.9 µg/L (total).

The guideline of 4.9 µg/L for Cr(III) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 9.5 for Cobalt (total):

Continuous or intermittent use on all soils.

Note 9.6 for Lithium (total):

The guideline is 2.5 mg/L for non-citrus crops (May not be protective of barley and other cereal crops; 1.0 mg/L suggested for cereal crops). The guideline is 0.75 mg/L for citrus crops. / The most stringent guideline was used in this report.

10. Notes for BC Source Drinking Water Quality Guidelines - Maximum Acceptable Concentrations (2020 and updates) (BC SDWQG MAC)**General Notes:**

The source drinking water quality guidelines apply to the ambient water before it is treated and distributed for domestic use. The guidelines apply to drinking water sources from surface water and groundwater.

Note 10.1 for Copper (total):

Includes short-term and long-term exposure.

11. Notes for BC Source Drinking Water Quality Guidelines - Aesthetic Objectives (2020 and updates) (BC SDWQG AO)**General Notes:**

The source drinking water quality guidelines apply to the ambient water before it is treated and distributed for domestic use. The guidelines apply to drinking water sources from surface water and groundwater.

Note 11.1 for Phosphorus (total, by ICPMS/ICPOES):

The AO for lakes is 0.01 mg/L. For lakes with residence time > 6 months, measure total P during spring overturn. For lakes with residence time < 6 months, measure mean epilimnetic total P during the growing season (ENV 1985).

Note 11.2 for Phosphorus (total, APHA 4500-P):

The AO for lakes is 0.01 mg/L. For lakes with residence time > 6 months, measure total P during spring overturn. For lakes with residence time < 6 months, measure mean epilimnetic total P during the growing season (ENV 1985).

Note 11.3 for Phosphorus (dissolved, APHA 4500-P):

The AO for lakes is 0.01 mg/L. For lakes with residence time > 6 months, measure total P during spring overturn. For lakes with residence time < 6 months, measure mean epilimnetic total P during the growing season (ENV 1985).

12. Notes for BC CSR Generic Numerical Water Standards for Freshwater Aquatic Life (CSR AW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Aquatic life standards assume minimum 1:10 dilution available.

Standards for all organic substances are for total substance concentrations. Any water sample to be analyzed for organic substances should not be filtered. Standards for surface water samples to be analyzed for heavy metals, metalloids and inorganic ions are total substance concentrations. In addition, it is recommended that surface water samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for dissolved substance concentrations.

Standards for groundwater samples for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations. In addition, it is recommended that groundwater samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for total substance concentrations. / The standard to protect freshwater aquatic life was used when separate aquatic life standards are provided for freshwater aquatic life and marine aquatic life.

Note 12.1 for Salinity:

Standard is for salinity measurements by electrical conductivity or density methods using the Practical Salinity Scale, which closely equates to concentration units of parts per thousand (g/kg or g/L). Salinity measurements using the Practical Salinity Scale may be denoted as Practical Salinity Units (psu).

Standard applies only if minimum 1:10 dilution is available in receiving waterbody.

Freshwater is defined as water having a natural salinity < 1.5 psu.

Note 12.2 for Sulphate:

The standard for sulfate is:

1280 mg/L @ H ≤ 30

2180 mg/L @ H 31 - 75

3090 mg/L @ H 76 - 180

4290 mg/L @ H > 180

Where H means water hardness in mg/L as CaCO₃.

Note 12.3 for Ammonia (total, as N):

Standard varies with pH and temperature. 10 degrees C is assumed. Consult a director for further advice.

The standard for ammonia, total (as N) is:

- 1,310 µg/L @ pH ≥ to 8.5
- 3,700 µg/L @ pH 8.0 - < 8.5
- 11,300 µg/L @ pH 7.5 - < 8.0
- 18,500 µg/L @ pH 7.0 - < 7.5
- 18,400 µg/L @ pH < 7.0

Note 12.4 for Nitrate (as N):

Standard may not protect all amphibians. Consult director for further advice.

Note 12.5 for Nitrate + Nitrite (as N):

Standard may not protect all amphibians. Consult director for further advice.

Note 12.6 for Nitrate + Nitrite (as N) (calculated):

Standard may not protect all amphibians. Consult director for further advice.

Note 12.7 for Nitrite (as N):

Standard varies with chloride concentration. Consult a director for further advice.

The standard for nitrite (as N) is:

- 200 µg/L (Cl < 2 mg/L)
- 400 µg/L (Cl 2 - < 4 mg/L)
- 600 µg/L (Cl 4 - < 6 mg/L)
- 800 µg/L (Cl 6 - < 8 mg/L)
- 1,000 µg/L (Cl 8 - < 10 mg/L)
- 2,000 µg/L (Cl ≥ 10 mg/L)

Note 12.8 for Cadmium (total):

The standard for cadmium is as follows:

- 0.5 µg/L @ H < 30
- 1.5 µg/L @ H 30 - < 90
- 2.5 µg/L @ H 90 - < 150
- 3.5 µg/L @ H 150 - < 210
- 4 µg/L @ H ≥ 210

Where H means water hardness in mg/L as CaCO₃.

Note 12.9 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 10 µg/L for chromium, hexavalent. Standard is 90 µg/L for chromium, trivalent. The standard of 10 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

Note 12.10 for Copper (total):

The standard for copper is as follows:

- 20 µg/L @ H < 50
- 30 µg/L @ H 50 - < 75
- 40 µg/L @ H 75 - < 100
- 50 µg/L @ H 100 - < 125
- 60 µg/L @ H 125 - < 150
- 70 µg/L @ H 150 - < 175
- 80 µg/L @ H 175 - < 200
- 90 µg/L @ H ≥ 200

Where H means water hardness in mg/L as CaCO₃.

Note 12.11 for Lead (total):

The standard for lead is as follows:

- 40 µg/L @ H < 50
- 50 µg/L @ H 50 - < 100
- 60 µg/L @ H 100 - < 200
- 110 µg/L @ H 200 - < 300
- 160 µg/L @ ≥ 300

Where H means water hardness in mg/L as CaCO₃.

Note 12.12 for Nickel (total):

The standard for nickel is as follows:

- 250 µg/L @ H < 60
- 650 µg/L @ H 60 - < 120
- 1,100 µg/L @ H 120 - < 180
- 1,500 µg/L @ H ≥ 180

Where H means water hardness in mg/L as CaCO₃.

Note 12.13 for Silver (total):

The standard for silver is:

0.5 µg/L @ H ≤ 100

15 µg/L @ H > 100

Where H means water hardness in mg/L as CaCO₃.

Note 12.14 for Zinc (total):

The standard for zinc is as follows:

75 µg/L @ H < 90

150 µg/L @ H = 90 - < 100

900 µg/L @ H = 100 - < 200

1,650 µg/L @ H = 200 - < 300

2,400 µg/L @ H = 300 - < 400

3,150 µg/L @ H = 400 - < 500

If H ≥ 500 then use following formula:

Standard (µg/L) = 10 x [7.5 + {(0.75)(H - 90)}]

Where H means water hardness in mg/L as CaCO₃.

There are special ministry approval and data reporting requirements for water hardness values ≥ 500 mg/L as CaCO₃.

Reference is Schedule 3.2 and Protocol 10.

13. Notes for BC CSR Generic Numerical Water Standards for Irrigation (CSR IW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Standards for all organic substances are for total substance concentrations. Any water sample to be analyzed for organic substances should not be filtered.

Standards for surface water samples to be analyzed for heavy metals, metalloids and inorganic ions are total substance concentrations. In addition, it is recommended that surface water samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for dissolved substance concentrations.

Standards for groundwater samples for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations. In addition, it is recommended that groundwater samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for total substance concentrations.

Standards apply to irrigation of all soil types, unless otherwise indicated. / There are several different standards for site-specific factors for some analytes. The most stringent standards were used for this criteria set.

Note 13.1 for Chloride:

Standard to protect all types of crops.

Note 13.2 for Boron (total):

Standard varies depending on crop. This standard is for blackberry crop.

Note 13.3 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 8 µg/L for chromium, hexavalent. Standard is 5 µg/L for chromium, trivalent. The standard of 5 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

Note 13.4 for Iron (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

(a) item A6, A7, A8 or A11

(b) item C1, C2, C3, C4 or C6,

(c) item D2, D3, D5, or D6

(d) item E4, or

(e) item H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above.

Note 13.5 for Lithium (total):

Standard to protect all types of crops.

Note 13.6 for Manganese (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

(a) item B1

(b) item C1, C3 or C4

(c) item D2, D3, D5, or D6

(d) item E4, or

(e) item H3 or H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above.

Note 13.7 for Molybdenum (total):

Standard varies with crop, soil drainage and Mo:Cu ratio. Standard is 10 – 30 µg/L. Consult a director for further advice.

The most stringent standard of 10 µg/L has been used.

Note 13.8 for Selenium (total):

Standard varies with type of application; continuous or intermittent. This standard is for continuous applications on crops.

Note 13.9 for Zinc (total):

The standard varies (from 1000 to 5000 µg/L) with soil pH. This standard (which is the most stringent) is for soil pH less than 6.0

14. Notes for BC CSR Generic Numerical Water Standards for Livestock (CSR LW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Standards for all organic substances are for total substance concentrations. Any water sample to be analyzed for organic substances should not be filtered.

Standards for surface water samples to be analyzed for heavy metals, metalloids and inorganic ions are total substance concentrations. In addition, it is recommended that surface water samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for dissolved substance concentrations.

Standards for groundwater samples for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations. In addition, it is recommended that groundwater samples being analyzed for heavy metals, metalloids and inorganic ions should also be analyzed for total substance concentrations.

Note 14.1 for Nitrate (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 14.2 for Nitrate + Nitrite (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 14.3 for Nitrate + Nitrite (as N) (calculated):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 14.4 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 50 µg/L for chromium, hexavalent. Standard is 50 µg/L for chromium, trivalent. The standard of 50 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

15. Notes for BC CSR Generic Numerical Water Standards for Drinking Water (CSR DW)**General Notes:**

BC Contaminated Sites Regulation, Generic Numerical Water Standards, Schedule 3.2; includes amendments up to B.C. Reg. 13/2019, January 24, 2019.

Drinking water standards are for unfiltered samples obtained at the point of consumption. Heavy metals, metalloids and inorganic ions are expressed as total substance concentrations unless otherwise indicated.

Note 15.1 for Chloride:

Standard to protect against taste and odour concerns.

Note 15.2 for Sulphate:

Standard to protect against taste and odour concerns.

Note 15.3 for Nitrate (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 15.4 for Nitrate + Nitrite (as N):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 15.5 for Nitrate + Nitrite (as N) (calculated):

Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 15.6 for Aluminum (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 15.7 for Chromium (total):

Analytical results for chromium (all species) in water may be used to demonstrate compliance with the standards. Where the standards cannot be met based on analytical results for chromium (all species), chromium speciation may be necessary.

Standard is 50 µg/L for chromium, hexavalent. Standard is 6000 µg/L for chromium, trivalent. The standard of 50 µg/L was used to identify exceedances for total chromium in order to demonstrate compliance with the standards.

Note 15.8 for Copper (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups. Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 15.9 for Iron (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

- (a) item A6, A7, A8 or A11
- (b) item C1, C2, C3, C4 or C6,
- (c) item D2, D3, D5, or D6
- (d) item E4, or
- (e) item H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above.

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 15.10 for Manganese (total):

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

- (a) item B1
- (b) item C1, C3 or C4
- (c) item D2, D3, D5, or D6
- (d) item E4, or
- (e) item H3 or H14.

Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as item H11 or H20, but only if the site was used for the purpose or activity in conjunction with or as a result of the site also being used for at least one of the purposes or activities set out above.

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.

Note 15.11 for Sodium (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Note 15.12 for Zinc (total):

Standard is specific to protection of human health. Standard is derived with TRV protective of adults. Standard may not adequately protect other age groups.

Okanagan Falls Advanced Wastewater Treatment Facility

Water Quality Results

Exceedances by Guideline

Sampling Location	Guideline	Exceedances
Vaseux Lake 1, 5, 10 m composite	BCAWQG AL (LT)	Dissolved oxygen [F]
	BCAWQG AL (ST)	Temperature [F]
	GCDWQ AO	Manganese (total), Temperature [F]
	BC SDWQG AO	Manganese (total), Temperature [F]
Vaseux Lake 20, 22, 24 m composite	BCAWQG AL (LT)	Dissolved oxygen [F]
	BCAWQG AL (ST)	Dissolved oxygen [F]
	GCDWQ MAC	Manganese (total)
	GCDWQ AO	Iron (total), Manganese (total)
	BCWWQG I	Manganese (total)
	BC SDWQG MAC	Manganese (total)
	BC SDWQG AO	Iron (total), Manganese (total)
	CSR IW	Manganese (total)

[F] = Field Result(s)

Exceedances by Analyte

	Vaseux Lake 1, 5, 10 m composite	Vaseux Lake 20, 22, 24 m composite
Field Results		
Dissolved oxygen	X	X
Temperature	X	
Lab Results		
Total Metals		
Iron (total)		X
Manganese (total)	X	X

Legend for Reports for RDOS Landfill and Wastewater Treatment Sites Water Quality Results

<	Less than reported detection limit
>	Greater than reported upper detection limit
>=	Greater than or equal to
A	Absent
BC SDWQG AO	BC Source Drinking Water Quality Guidelines - Aesthetic Objectives (2020 and updates)
BC SDWQG MAC	BC Source Drinking Water Quality Guidelines - Maximum Acceptable Concentrations (2020 and updates)
BCAWQG AL (LT)	BC Approved Water Quality Guidelines for freshwater aquatic life (Long-term chronic)
BCAWQG AL (ST)	BC Approved Water Quality Guidelines for freshwater aquatic life (Short-term acute)
BCAWQG I	BC Approved Water Quality Guidelines for irrigation
BCAWQG L	BC Approved Water Quality Guidelines for livestock
BCWWQG AL	BC Working Water Quality Guidelines for Freshwater Aquatic Life (2020)
BCWWQG I	BC Working Water Quality Guidelines for Irrigation (2020)
BCWWQG L	BC Working Water Quality Guidelines for Livestock (2020)
Calc	Calculated guideline or standard. The guideline or standard is dependent on the value of one or more other analytes, and is calculated from a formula or table.
CSR AW	BC CSR Generic Numerical Water Standards for Freshwater Aquatic Life
CSR DW	BC CSR Generic Numerical Water Standards for Drinking Water
CSR IW	BC CSR Generic Numerical Water Standards for Irrigation
CSR LW	BC CSR Generic Numerical Water Standards for Livestock
GCDWQ AO	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives
GCDWQ MAC	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations
L	Laboratory reading type (Lab result)
m asl	metres above sea level
N	Narrative type of guideline or standard, or Result Note.
ND	Non-detect. Result is less than lower detection limit.
NG	No Guideline
NR	No Result
NS	No Standard
NT	Not Tested
OG	Overgrown
P	Present
PR	Presumptive
TK	Test kit reading type (Field result)
TNTC	Too numerous to count
	Highlighted value has a lower detection limit that is greater than the guideline/standard maximum and/or the guideline/standard minimum, or has an upper detection limit that is less than the guideline/standard maximum and/or the guideline/standard minimum.
	The maximum guideline/standard value cannot be determined because a result for a dependent analyte is not available for the sample.
<u>BC SDWQG AO</u>	Highlighted value exceeds BC SDWQG AO
<u>BC SDWQG MAC</u>	Highlighted value exceeds BC SDWQG MAC
<u>BCAWQG AL (LT)</u>	Highlighted value exceeds BCAWQG AL (LT)
<u>BCAWQG AL (ST)</u>	Highlighted value exceeds BCAWQG AL (ST)
<u>BCAWQG I</u>	Highlighted value exceeds BCAWQG I
<u>BCAWQG L</u>	Highlighted value exceeds BCAWQG L
<u>BCWWQG AL</u>	Highlighted value exceeds BCWWQG AL
<u>BCWWQG I</u>	Highlighted value exceeds BCWWQG I
<u>BCWWQG L</u>	Highlighted value exceeds BCWWQG L
<u>CSR AW</u>	Highlighted value exceeds CSR AW
<u>CSR DW</u>	Highlighted value exceeds CSR DW
<u>CSR IW</u>	Highlighted value exceeds CSR IW
<u>CSR LW</u>	Highlighted value exceeds CSR LW
<u>GCDWQ AO</u>	Highlighted value exceeds GCDWQ AO
<u>GCDWQ MAC</u>	Highlighted value exceeds GCDWQ MAC
<u>SL Criteria Override</u>	Highlighted value exceeds sampling location criteria override

APPENDIX T

Vaseux Lake Water Quality Monitoring 2021 Lab Reports



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21C1783
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-03-12 12:53 / 7°C
PO NUMBER	OK Falls (Vaseux Lake) via LAC	REPORTED	2021-03-19 13:51
PROJECT	OK Falls (Vaseux Lake) via LAC	COC NUMBER	44174.36895
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

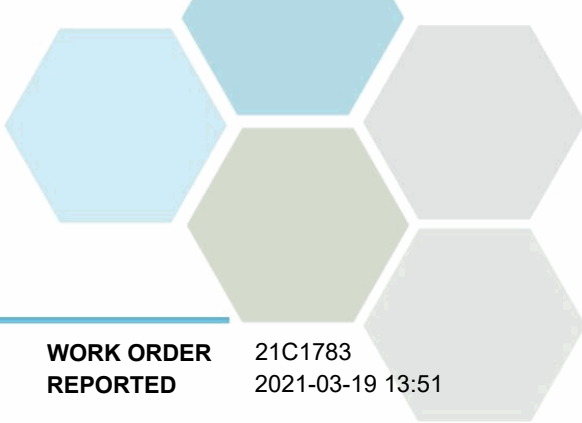
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21C1783
2021-03-19 13:51

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10m Composite (21C1783-01) | Matrix: Water | Sampled: 2021-03-12 10:00

Anions

Chloride	6.12	AO ≤ 250	0.10 mg/L	2021-03-13	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-03-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-03-13	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-03-13	
Sulfate	29.4	AO ≤ 500	1.0 mg/L	2021-03-13	

Calculated Parameters

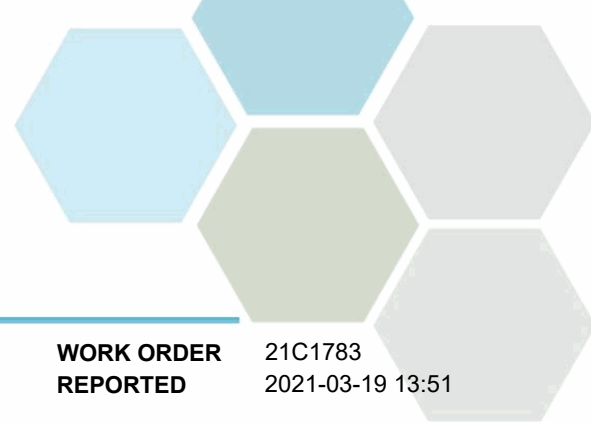
Hardness, Total (as CaCO3)	121	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.207	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.207	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	None Required	0.050 mg/L	2021-03-12	
Chlorophyll a	1.94	N/A	0.10 µg/L	2021-03-19	
Nitrogen, Total Kjeldahl	0.207	N/A	0.050 mg/L	2021-03-17	
Phosphorus, Total (as P)	0.0115	N/A	0.0050 mg/L	2021-03-17	
Phosphorus, Total Dissolved	0.0050	N/A	0.0050 mg/L	2021-03-17	

Total Metals

Aluminum, total	0.0090	OG < 0.1	0.0050 mg/L	2021-03-17	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-03-17	
Arsenic, total	0.00053	MAC = 0.01	0.00050 mg/L	2021-03-17	
Barium, total	0.0245	MAC = 2	0.0050 mg/L	2021-03-17	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-03-17	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-03-17	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-03-17	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-03-17	
Calcium, total	32.6	None Required	0.20 mg/L	2021-03-17	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-03-17	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-03-17	
Copper, total	0.00086	MAC = 2	0.00040 mg/L	2021-03-17	
Iron, total	0.019	AO ≤ 0.3	0.010 mg/L	2021-03-17	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-03-17	
Lithium, total	0.00376	N/A	0.00010 mg/L	2021-03-17	
Magnesium, total	9.72	None Required	0.010 mg/L	2021-03-17	
Manganese, total	0.00757	MAC = 0.12	0.00020 mg/L	2021-03-17	
Molybdenum, total	0.00364	N/A	0.00010 mg/L	2021-03-17	
Nickel, total	0.00066	N/A	0.00040 mg/L	2021-03-17	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-03-17	
Potassium, total	2.57	N/A	0.10 mg/L	2021-03-17	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-03-17	
Silicon, total	2.5	N/A	1.0 mg/L	2021-03-17	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-03-17	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10m Composite (21C1783-01) Matrix: Water Sampled: 2021-03-12 10:00, Continued					
<i>Total Metals, Continued</i>					
Sodium, total	12.2	AO ≤ 200	0.10 mg/L	2021-03-17	
Strontium, total	0.330	7	0.0010 mg/L	2021-03-17	
Sulfur, total	13.4	N/A	3.0 mg/L	2021-03-17	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-03-17	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-03-17	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-03-17	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-03-17	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-03-17	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-03-17	
Uranium, total	0.00245	MAC = 0.02	0.000020 mg/L	2021-03-17	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-03-17	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-03-17	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-03-17	

Vaseux 20, 22, 24m Composite (21C1783-02) | Matrix: Water | Sampled: 2021-03-12 10:15

Anions

Chloride	6.14	AO ≤ 250	0.10 mg/L	2021-03-13	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-03-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-03-13	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-03-13	
Sulfate	29.4	AO ≤ 500	1.0 mg/L	2021-03-13	

Calculated Parameters

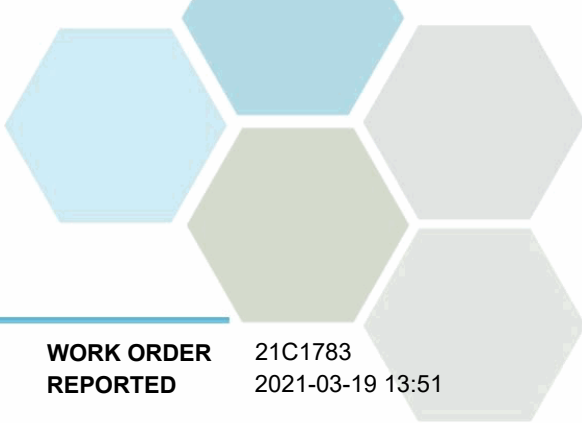
Hardness, Total (as CaCO3)	125	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.230	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.230	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	None Required	0.050 mg/L	2021-03-12	
Chlorophyll a	2.35	N/A	0.10 µg/L	2021-03-19	
Nitrogen, Total Kjeldahl	0.230	N/A	0.050 mg/L	2021-03-17	
Phosphorus, Total (as P)	0.0115	N/A	0.0050 mg/L	2021-03-17	
Phosphorus, Total Dissolved	0.0063	N/A	0.0050 mg/L	2021-03-17	

Total Metals

Aluminum, total	0.0106	OG < 0.1	0.0050 mg/L	2021-03-17	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-03-17	
Arsenic, total	0.00060	MAC = 0.01	0.00050 mg/L	2021-03-17	
Barium, total	0.0252	MAC = 2	0.0050 mg/L	2021-03-17	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-03-17	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-03-17	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-03-17	

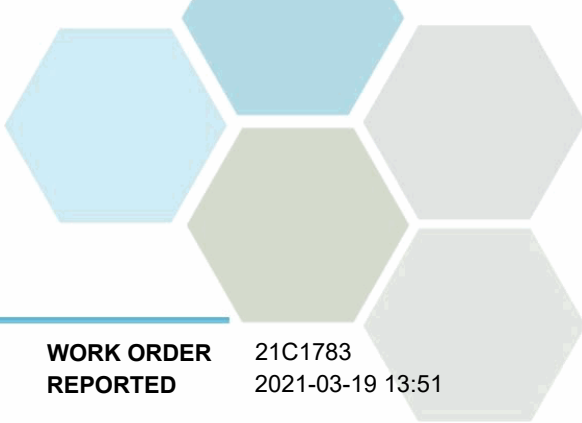


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21C1783
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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Vaseux 20, 22, 24m Composite (21C1783-02) Matrix: Water Sampled: 2021-03-12 10:15, Continued						
<i>Total Metals, Continued</i>						
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-03-17	
Calcium, total	32.9	None Required	0.20	mg/L	2021-03-17	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-03-17	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-03-17	
Copper, total	0.00088	MAC = 2	0.00040	mg/L	2021-03-17	
Iron, total	0.020	AO ≤ 0.3	0.010	mg/L	2021-03-17	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-03-17	
Lithium, total	0.00370	N/A	0.00010	mg/L	2021-03-17	
Magnesium, total	10.4	None Required	0.010	mg/L	2021-03-17	
Manganese, total	0.00775	MAC = 0.12	0.00020	mg/L	2021-03-17	
Molybdenum, total	0.00350	N/A	0.00010	mg/L	2021-03-17	
Nickel, total	0.00071	N/A	0.00040	mg/L	2021-03-17	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2021-03-17	
Potassium, total	2.73	N/A	0.10	mg/L	2021-03-17	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-03-17	
Silicon, total	2.7	N/A	1.0	mg/L	2021-03-17	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-03-17	
Sodium, total	13.1	AO ≤ 200	0.10	mg/L	2021-03-17	
Strontium, total	0.334	7	0.0010	mg/L	2021-03-17	
Sulfur, total	15.1	N/A	3.0	mg/L	2021-03-17	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-03-17	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-03-17	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-03-17	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-03-17	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-03-17	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-03-17	
Uranium, total	0.00239	MAC = 0.02	0.000020	mg/L	2021-03-17	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-03-17	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2021-03-17	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-03-17	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
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Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

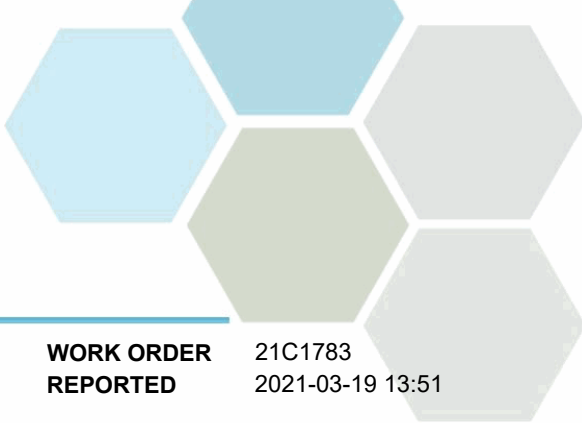
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

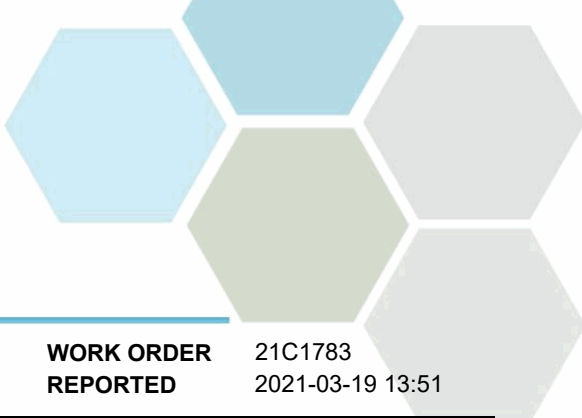
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General Comments:

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: acrump@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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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 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
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Anions, Batch B1C1230

Blank (B1C1230-BLK1)			Prepared: 2021-03-13, Analyzed: 2021-03-13						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							

LCS (B1C1230-BS1)			Prepared: 2021-03-13, Analyzed: 2021-03-13						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	4.04	0.010 mg/L	4.00		101	90-110			
Nitrite (as N)	1.98	0.010 mg/L	2.00		99	85-115			
Phosphate (as P)	1.09	0.0050 mg/L	1.00		109	80-120			
Sulfate	16.1	1.0 mg/L	16.0		101	90-110			

General Parameters, Batch B1C1247

Blank (B1C1247-BLK1)			Prepared: 2021-03-12, Analyzed: 2021-03-12						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							

Blank (B1C1247-BLK2)			Prepared: 2021-03-12, Analyzed: 2021-03-12						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							

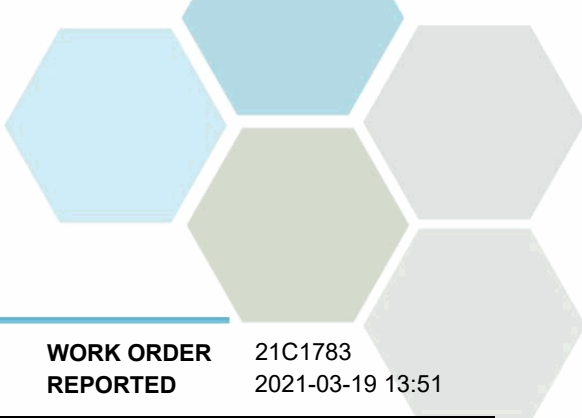
LCS (B1C1247-BS1)			Prepared: 2021-03-12, Analyzed: 2021-03-12						
Ammonia, Total (as N)	0.968	0.050 mg/L	1.00		97	90-115			

LCS (B1C1247-BS2)			Prepared: 2021-03-12, Analyzed: 2021-03-12						
Ammonia, Total (as N)	1.02	0.050 mg/L	1.00		102	90-115			

General Parameters, Batch B1C1284

Blank (B1C1284-BLK1)			Prepared: 2021-03-12, Analyzed: 2021-03-19						
Chlorophyll a	< 0.10	0.10 µg/L							

General Parameters, Batch B1C1604

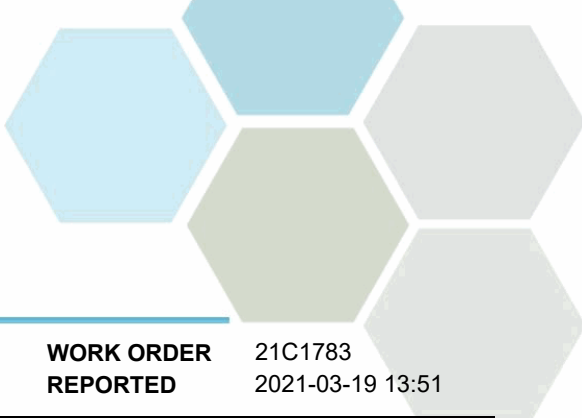


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1C1604, Continued									
Blank (B1C1604-BLK1)			Prepared: 2021-03-16, Analyzed: 2021-03-17						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B1C1604-BLK2)			Prepared: 2021-03-16, Analyzed: 2021-03-17						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1C1604-BS1)			Prepared: 2021-03-16, Analyzed: 2021-03-17						
Nitrogen, Total Kjeldahl	1.04	0.050 mg/L	1.00		104	85-115			
LCS (B1C1604-BS2)			Prepared: 2021-03-16, Analyzed: 2021-03-17						
Nitrogen, Total Kjeldahl	1.04	0.050 mg/L	1.00		104	85-115			
General Parameters, Batch B1C1665									
Blank (B1C1665-BLK1)			Prepared: 2021-03-16, Analyzed: 2021-03-17						
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
LCS (B1C1665-BS1)			Prepared: 2021-03-16, Analyzed: 2021-03-17						
Phosphorus, Total (as P)	0.105	0.0050 mg/L	0.100		105	85-115			
Phosphorus, Total Dissolved	0.103	0.0050 mg/L	0.100		103	85-115			
Total Metals, Batch B1C1631									
Blank (B1C1631-BLK1)			Prepared: 2021-03-16, Analyzed: 2021-03-17						
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							

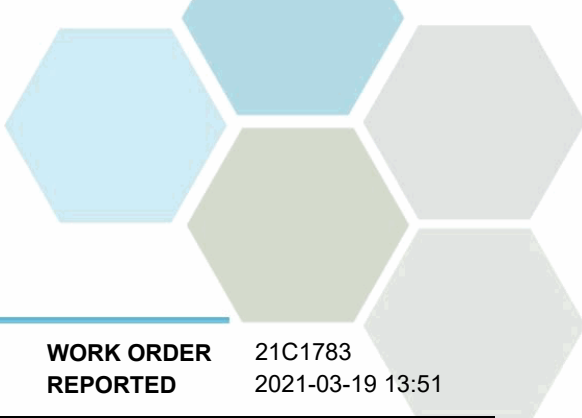


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1C1631, Continued									
Blank (B1C1631-BLK1), Continued					Prepared: 2021-03-16, Analyzed: 2021-03-17				
Tungsten, total	< 0.0010	0.0010 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 (B1C1631-BS1)					Prepared: 2021-03-16, Analyzed: 2021-03-17				
Aluminum, total	0.0207	0.0050 mg/L	0.0199		104	80-120			
Antimony, total	0.0222	0.00020 mg/L	0.0200		111	80-120			
Arsenic, total	0.0218	0.00050 mg/L	0.0200		109	80-120			
Barium, total	0.0217	0.0050 mg/L	0.0198		110	80-120			
Beryllium, total	0.0217	0.00010 mg/L	0.0198		110	80-120			
Bismuth, total	0.0206	0.00010 mg/L	0.0200		103	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		94	80-120			
Cadmium, total	0.0218	0.000010 mg/L	0.0199		109	80-120			
Calcium, total	1.97	0.20 mg/L	2.02		98	80-120			
Chromium, total	0.0220	0.00050 mg/L	0.0198		111	80-120			
Cobalt, total	0.0222	0.00010 mg/L	0.0199		112	80-120			
Copper, total	0.0221	0.00040 mg/L	0.0200		111	80-120			
Lead, total	0.0201	0.00020 mg/L	0.0199		101	80-120			
Lithium, total	0.0213	0.00010 mg/L	0.0200		107	80-120			
Magnesium, total	2.12	0.010 mg/L	2.02		105	80-120			
Manganese, total	0.0202	0.00020 mg/L	0.0199		102	80-120			
Molybdenum, total	0.0215	0.00010 mg/L	0.0200		108	80-120			
Nickel, total	0.0226	0.00040 mg/L	0.0200		113	80-120			
Phosphorus, total	2.29	0.050 mg/L	2.00		114	80-120			
Potassium, total	2.02	0.10 mg/L	2.02		100	80-120			
Selenium, total	0.0215	0.00050 mg/L	0.0200		107	80-120			
Silicon, total	1.7	1.0 mg/L	2.00		87	80-120			
Silver, total	0.0217	0.000050 mg/L	0.0200		109	80-120			
Sodium, total	2.05	0.10 mg/L	2.02		102	80-120			
Strontium, total	0.0222	0.0010 mg/L	0.0200		111	80-120			
Sulfur, total	5.7	3.0 mg/L	5.00		114	80-120			
Tellurium, total	0.0243	0.00050 mg/L	0.0200		122	80-120			SPK1
Thallium, total	0.0201	0.000020 mg/L	0.0199		101	80-120			
Thorium, total	0.0193	0.00010 mg/L	0.0200		96	80-120			
Tin, total	0.0223	0.00020 mg/L	0.0200		111	80-120			
Titanium, total	0.0239	0.0050 mg/L	0.0200		119	80-120			
Tungsten, total	0.0219	0.0010 mg/L	0.0200		109	80-120			
Uranium, total	0.0194	0.000020 mg/L	0.0200		97	80-120			
Vanadium, total	0.0239	0.0010 mg/L	0.0200		119	80-120			
Zinc, total	0.0239	0.0040 mg/L	0.0200		119	80-120			
Zirconium, total	0.0218	0.00010 mg/L	0.0200		109	80-120			
Reference (B1C1631-SRM1)					Prepared: 2021-03-16, Analyzed: 2021-03-17				
Aluminum, total	0.312	0.0050 mg/L	0.299		104	70-130			
Antimony, total	0.0540	0.00020 mg/L	0.0517		105	70-130			
Arsenic, total	0.137	0.00050 mg/L	0.119		115	70-130			
Barium, total	0.817	0.0050 mg/L	0.801		102	70-130			
Beryllium, total	0.0549	0.00010 mg/L	0.0501		109	70-130			
Boron, total	4.02	0.0500 mg/L	4.11		98	70-130			
Cadmium, total	0.0517	0.000010 mg/L	0.0503		103	70-130			
Calcium, total	9.99	0.20 mg/L	10.7		93	70-130			
Chromium, total	0.265	0.00050 mg/L	0.250		106	70-130			
Cobalt, total	0.0416	0.00010 mg/L	0.0384		108	70-130			
Copper, total	0.521	0.00040 mg/L	0.487		107	70-130			
Iron, total	0.547	0.010 mg/L	0.504		109	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21C1783
2021-03-19 13:51

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1C1631, Continued									
Reference (B1C1631-SRM1), Continued					Prepared: 2021-03-16, Analyzed: 2021-03-17				
Lead, total	0.286	0.00020 mg/L	0.278		103	70-130			
Lithium, total	0.422	0.00010 mg/L	0.398		106	70-130			
Magnesium, total	3.81	0.010 mg/L	3.59		106	70-130			
Manganese, total	0.107	0.00020 mg/L	0.111		96	70-130			
Molybdenum, total	0.206	0.00010 mg/L	0.196		105	70-130			
Nickel, total	0.269	0.00040 mg/L	0.248		109	70-130			
Phosphorus, total	0.235	0.050 mg/L	0.213		110	70-130			SRM
Potassium, total	6.30	0.10 mg/L	5.89		107	70-130			
Selenium, total	0.129	0.00050 mg/L	0.120		107	70-130			
Sodium, total	9.00	0.10 mg/L	8.71		103	70-130			
Strontium, total	0.410	0.0010 mg/L	0.393		104	70-130			
Thallium, total	0.0812	0.000020 mg/L	0.0787		103	70-130			
Uranium, total	0.0345	0.000020 mg/L	0.0344		100	70-130			
Vanadium, total	0.415	0.0010 mg/L	0.391		106	70-130			
Zinc, total	2.75	0.0040 mg/L	2.50		110	70-130			

QC Qualifiers:

- SPK1 The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.
- SRM Recovery of one or more analytes on Standard Reference Material (SRM) analysis are outside of control limits.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21D0758
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-04-08 12:59 / 6°C
PO NUMBER	OK Falls (Vaseux Lake) via LAC	REPORTED	2021-04-15 13:56
PROJECT	OK Falls (Vaseux Lake) via LAC	COC NUMBER	44174.36895
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

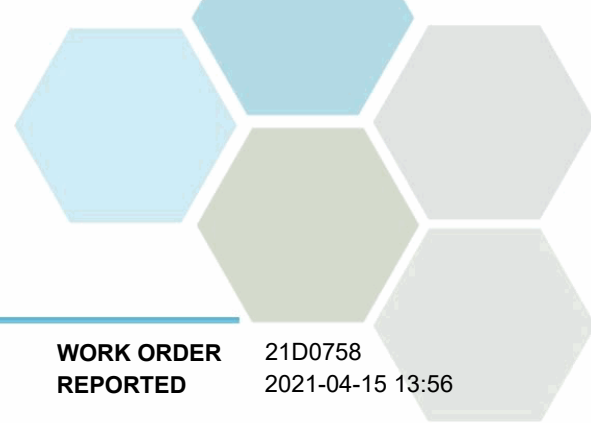
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4

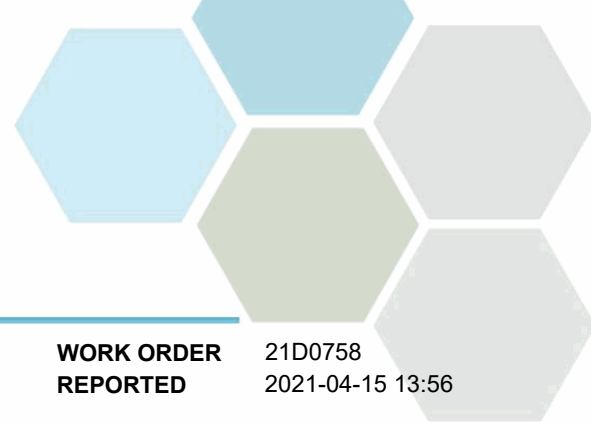


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10 m composite (21D0758-01) Matrix: Water Sampled: 2021-04-08 08:45					
Anions					
Chloride	6.40	AO ≤ 250	0.10 mg/L	2021-04-10	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-04-10	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-04-10	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-04-10	
Sulfate	29.5	AO ≤ 500	1.0 mg/L	2021-04-10	
Calculated Parameters					
Hardness, Total (as CaCO3)	119	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.231	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.231	N/A	0.0500 mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	< 0.020	None Required	0.020 mg/L	2021-04-13	
Chlorophyll a	1.64	N/A	0.10 µg/L	2021-04-13	
Nitrogen, Total Kjeldahl	0.231	N/A	0.050 mg/L	2021-04-13	
Phosphorus, Total (as P)	0.0110	N/A	0.0050 mg/L	2021-04-13	
Phosphorus, Total Dissolved	0.0067	N/A	0.0050 mg/L	2021-04-13	
Total Metals					
Aluminum, total	0.0133	OG < 0.1	0.0050 mg/L	2021-04-14	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-04-14	
Arsenic, total	0.00052	MAC = 0.01	0.00050 mg/L	2021-04-14	
Barium, total	0.0235	MAC = 2	0.0050 mg/L	2021-04-14	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-04-14	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-04-14	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-04-14	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-04-14	
Calcium, total	31.5	None Required	0.20 mg/L	2021-04-14	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-04-14	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-04-14	
Copper, total	0.00098	MAC = 2	0.00040 mg/L	2021-04-14	
Iron, total	0.027	AO ≤ 0.3	0.010 mg/L	2021-04-14	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-04-14	
Lithium, total	0.00328	N/A	0.00010 mg/L	2021-04-14	
Magnesium, total	9.85	None Required	0.010 mg/L	2021-04-14	
Manganese, total	0.00736	MAC = 0.12	0.00020 mg/L	2021-04-14	
Molybdenum, total	0.00332	N/A	0.00010 mg/L	2021-04-14	
Nickel, total	0.00089	N/A	0.00040 mg/L	2021-04-14	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-04-14	
Potassium, total	2.42	N/A	0.10 mg/L	2021-04-14	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-04-14	
Silicon, total	1.8	N/A	1.0 mg/L	2021-04-14	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-04-14	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10 m composite (21D0758-01) Matrix: Water Sampled: 2021-04-08 08:45, Continued					
<i>Total Metals, Continued</i>					
Sodium, total	12.5	AO ≤ 200	0.10 mg/L	2021-04-14	
Strontium, total	0.282	7	0.0010 mg/L	2021-04-14	
Sulfur, total	10.0	N/A	3.0 mg/L	2021-04-14	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-04-14	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-04-14	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-04-14	
Tin, total	0.00036	N/A	0.00020 mg/L	2021-04-14	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-04-14	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-04-14	
Uranium, total	0.00251	MAC = 0.02	0.000020 mg/L	2021-04-14	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-04-14	
Zinc, total	0.0062	AO ≤ 5	0.0040 mg/L	2021-04-14	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-04-14	

Vaseux 20, 22, 24 m composite (21D0758-02) | Matrix: Water | Sampled: 2021-04-08 09:00

Anions

Chloride	6.32	AO ≤ 250	0.10 mg/L	2021-04-10	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-04-10	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-04-10	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-04-10	
Sulfate	30.0	AO ≤ 500	1.0 mg/L	2021-04-10	

Calculated Parameters

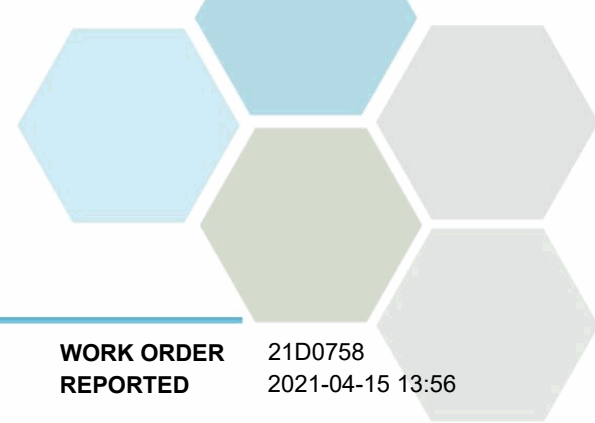
Hardness, Total (as CaCO3)	124	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.210	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.210	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.020	None Required	0.020 mg/L	2021-04-13	
Chlorophyll a	2.21	N/A	0.10 µg/L	2021-04-13	
Nitrogen, Total Kjeldahl	0.210	N/A	0.050 mg/L	2021-04-13	
Phosphorus, Total (as P)	0.0171	N/A	0.0050 mg/L	2021-04-13	
Phosphorus, Total Dissolved	0.0067	N/A	0.0050 mg/L	2021-04-13	

Total Metals

Aluminum, total	0.0502	OG < 0.1	0.0050 mg/L	2021-04-14	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-04-14	
Arsenic, total	0.00060	MAC = 0.01	0.00050 mg/L	2021-04-14	
Barium, total	0.0243	MAC = 2	0.0050 mg/L	2021-04-14	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-04-14	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-04-14	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-04-14	

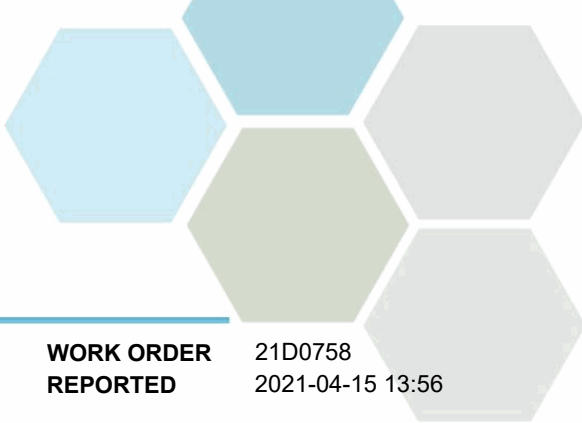


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Vaseux 20, 22, 24 m composite (21D0758-02) Matrix: Water Sampled: 2021-04-08 09:00, Continued						
<i>Total Metals, Continued</i>						
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-04-14	
Calcium, total	32.8	None Required	0.20	mg/L	2021-04-14	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-04-14	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-04-14	
Copper, total	0.00104	MAC = 2	0.00040	mg/L	2021-04-14	
Iron, total	0.070	AO ≤ 0.3	0.010	mg/L	2021-04-14	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-04-14	
Lithium, total	0.00354	N/A	0.00010	mg/L	2021-04-14	
Magnesium, total	10.3	None Required	0.010	mg/L	2021-04-14	
Manganese, total	0.0151	MAC = 0.12	0.00020	mg/L	2021-04-14	
Molybdenum, total	0.00347	N/A	0.00010	mg/L	2021-04-14	
Nickel, total	0.00060	N/A	0.00040	mg/L	2021-04-14	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2021-04-14	
Potassium, total	2.54	N/A	0.10	mg/L	2021-04-14	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-04-14	
Silicon, total	2.1	N/A	1.0	mg/L	2021-04-14	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-04-14	
Sodium, total	12.8	AO ≤ 200	0.10	mg/L	2021-04-14	
Strontium, total	0.296	7	0.0010	mg/L	2021-04-14	
Sulfur, total	12.2	N/A	3.0	mg/L	2021-04-14	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-04-14	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-04-14	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-04-14	
Tin, total	0.00233	N/A	0.00020	mg/L	2021-04-14	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-04-14	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-04-14	
Uranium, total	0.00256	MAC = 0.02	0.000020	mg/L	2021-04-14	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-04-14	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2021-04-14	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-04-14	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

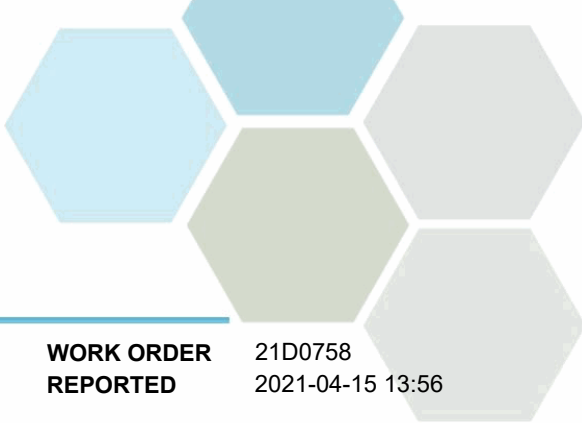
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

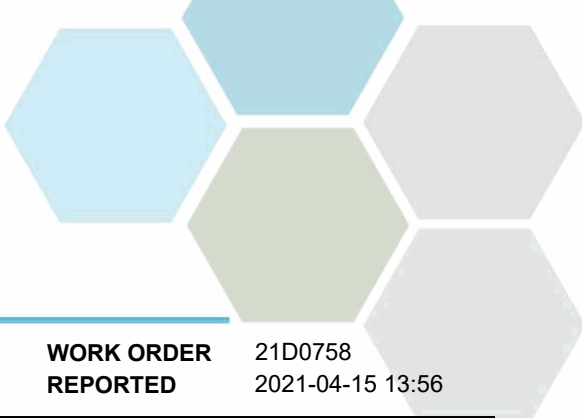
WORK ORDER REPORTED 21D0758
2021-04-15 13:56

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: acrump@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

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 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.

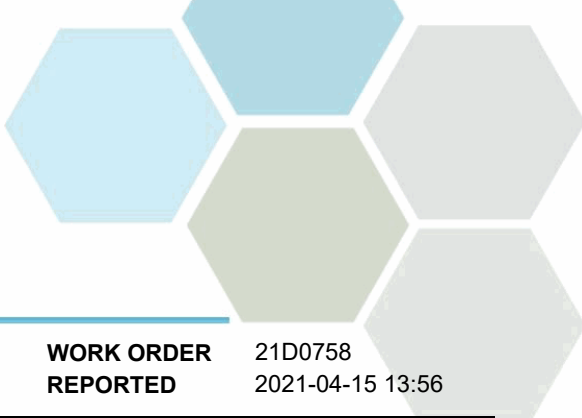
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B1D0656									
Blank (B1D0656-BLK1)			Prepared: 2021-04-09, Analyzed: 2021-04-09						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
Blank (B1D0656-BLK2)			Prepared: 2021-04-10, Analyzed: 2021-04-10						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
LCS (B1D0656-BS1)			Prepared: 2021-04-09, Analyzed: 2021-04-09						
Chloride	16.4	0.10 mg/L	16.0		102	90-110			
Nitrate (as N)	4.12	0.010 mg/L	4.00		103	90-110			
Nitrite (as N)	1.97	0.010 mg/L	2.00		99	85-115			
Phosphate (as P)	1.09	0.0050 mg/L	1.00		109	80-120			
Sulfate	16.3	1.0 mg/L	16.0		102	90-110			
LCS (B1D0656-BS2)			Prepared: 2021-04-10, Analyzed: 2021-04-10						
Chloride	16.3	0.10 mg/L	16.0		102	90-110			
Nitrate (as N)	4.23	0.010 mg/L	4.00		106	90-110			
Nitrite (as N)	1.91	0.010 mg/L	2.00		95	85-115			
Phosphate (as P)	1.06	0.0050 mg/L	1.00		106	80-120			
Sulfate	16.7	1.0 mg/L	16.0		104	90-110			

General Parameters, Batch B1D0447

Blank (B1D0447-BLK1)			Prepared: 2021-04-07, Analyzed: 2021-04-13						
Chlorophyll a	< 0.10	0.10 µg/L							

General Parameters, Batch B1D0920

Blank (B1D0920-BLK1)			Prepared: 2021-04-12, Analyzed: 2021-04-13						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							

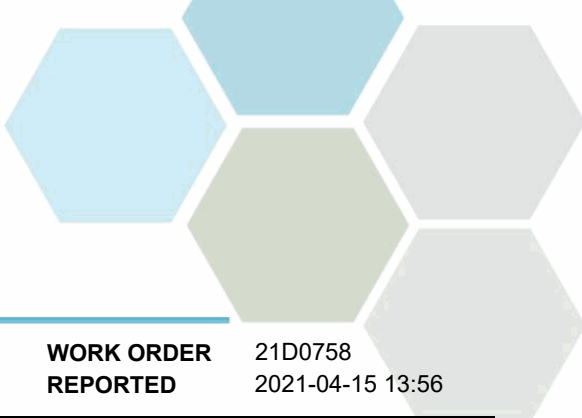


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1D0920, Continued									
Blank (B1D0920-BLK1), Continued			Prepared: 2021-04-12, Analyzed: 2021-04-13						
Blank (B1D0920-BLK2)			Prepared: 2021-04-12, Analyzed: 2021-04-13						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1D0920-BS1)			Prepared: 2021-04-12, Analyzed: 2021-04-13						
Nitrogen, Total Kjeldahl	1.02	0.050 mg/L	1.00		102	85-115			
LCS (B1D0920-BS2)			Prepared: 2021-04-12, Analyzed: 2021-04-13						
Nitrogen, Total Kjeldahl	1.02	0.050 mg/L	1.00		102	85-115			
General Parameters, Batch B1D0955									
Blank (B1D0955-BLK1)			Prepared: 2021-04-12, Analyzed: 2021-04-13						
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
LCS (B1D0955-BS1)			Prepared: 2021-04-12, Analyzed: 2021-04-13						
Phosphorus, Total (as P)	0.104	0.0050 mg/L	0.100		104	85-115			
Phosphorus, Total Dissolved	0.104	0.0050 mg/L	0.100		104	85-115			
Duplicate (B1D0955-DUP1)			Source: 21D0758-02		Prepared: 2021-04-12, Analyzed: 2021-04-13				
Phosphorus, Total (as P)	0.0164	0.0050 mg/L		0.0171					15
Phosphorus, Total Dissolved	0.0068	0.0050 mg/L		0.0067					15
Matrix Spike (B1D0955-MS1)			Source: 21D0758-02		Prepared: 2021-04-12, Analyzed: 2021-04-13				
Phosphorus, Total (as P)	0.117	0.0050 mg/L	0.102	0.0171	98	70-125			
Phosphorus, Total Dissolved	0.108	0.0050 mg/L	0.102	0.0067	100	70-125			
General Parameters, Batch B1D1003									
Blank (B1D1003-BLK1)			Prepared: 2021-04-13, Analyzed: 2021-04-13						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1D1003-BLK2)			Prepared: 2021-04-13, Analyzed: 2021-04-13						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
LCS (B1D1003-BS1)			Prepared: 2021-04-13, Analyzed: 2021-04-13						
Ammonia, Total (as N)	1.04	0.020 mg/L	1.00		104	90-115			
LCS (B1D1003-BS2)			Prepared: 2021-04-13, Analyzed: 2021-04-13						
Ammonia, Total (as N)	1.03	0.020 mg/L	1.00		103	90-115			
Total Metals, Batch B1D1047									
Blank (B1D1047-BLK1)			Prepared: 2021-04-13, Analyzed: 2021-04-14						
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							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1D1047, Continued

Blank (B1D1047-BLK1), Continued

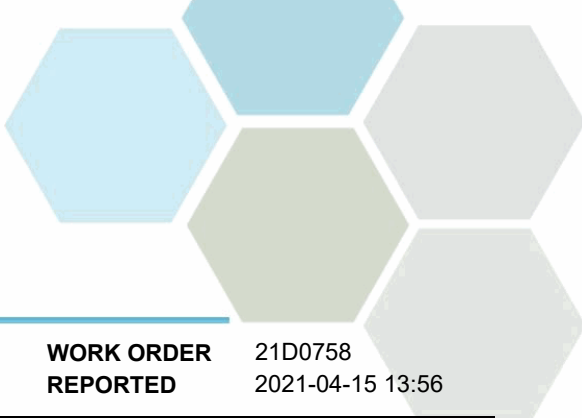
Prepared: 2021-04-13, Analyzed: 2021-04-14

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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B1D1047-BS1)

Prepared: 2021-04-13, Analyzed: 2021-04-14

Aluminum, total	0.0218	0.0050 mg/L	0.0199		110	80-120			
Antimony, total	0.0209	0.00020 mg/L	0.0200		105	80-120			
Arsenic, total	0.0188	0.00050 mg/L	0.0200		94	80-120			
Barium, total	0.0191	0.0050 mg/L	0.0198		96	80-120			
Beryllium, total	0.0194	0.00010 mg/L	0.0198		98	80-120			
Bismuth, total	0.0210	0.00010 mg/L	0.0200		105	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		100	80-120			
Cadmium, total	0.0195	0.000010 mg/L	0.0199		98	80-120			
Calcium, total	1.89	0.20 mg/L	2.02		94	80-120			
Chromium, total	0.0200	0.00050 mg/L	0.0198		101	80-120			
Cobalt, total	0.0202	0.00010 mg/L	0.0199		101	80-120			
Copper, total	0.0209	0.00040 mg/L	0.0200		104	80-120			
Iron, total	1.98	0.010 mg/L	2.02		98	80-120			
Lead, total	0.0209	0.00020 mg/L	0.0199		105	80-120			
Lithium, total	0.0208	0.00010 mg/L	0.0200		104	80-120			
Magnesium, total	2.16	0.010 mg/L	2.02		107	80-120			
Manganese, total	0.0218	0.00020 mg/L	0.0199		109	80-120			
Molybdenum, total	0.0196	0.00010 mg/L	0.0200		98	80-120			
Nickel, total	0.0202	0.00040 mg/L	0.0200		101	80-120			
Phosphorus, total	2.05	0.050 mg/L	2.00		103	80-120			
Potassium, total	2.03	0.10 mg/L	2.02		101	80-120			
Selenium, total	0.0205	0.00050 mg/L	0.0200		102	80-120			
Silicon, total	1.8	1.0 mg/L	2.00		92	80-120			
Silver, total	0.0200	0.000050 mg/L	0.0200		100	80-120			
Sodium, total	2.14	0.10 mg/L	2.02		106	80-120			
Strontium, total	0.0180	0.0010 mg/L	0.0200		90	80-120			
Sulfur, total	4.9	3.0 mg/L	5.00		98	80-120			
Tellurium, total	0.0201	0.00050 mg/L	0.0200		101	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

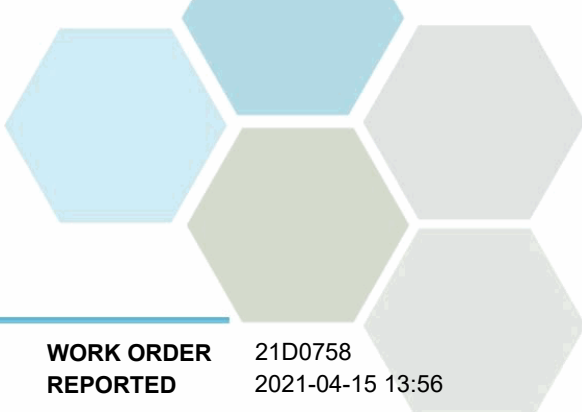
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1D1047, Continued

LCS (B1D1047-BS1), Continued				Prepared: 2021-04-13, Analyzed: 2021-04-14					
Thallium, total	0.0200	0.000020 mg/L	0.0199		101	80-120			
Thorium, total	0.0188	0.00010 mg/L	0.0200		94	80-120			
Tin, total	0.0213	0.00020 mg/L	0.0200		107	80-120			
Titanium, total	0.0203	0.0050 mg/L	0.0200		101	80-120			
Tungsten, total	0.0201	0.0010 mg/L	0.0200		101	80-120			
Uranium, total	0.0197	0.000020 mg/L	0.0200		99	80-120			
Vanadium, total	0.0201	0.0010 mg/L	0.0200		100	80-120			
Zinc, total	0.0219	0.0040 mg/L	0.0200		109	80-120			
Zirconium, total	0.0200	0.00010 mg/L	0.0200		100	80-120			

Duplicate (B1D1047-DUP1)				Source: 21D0758-02		Prepared: 2021-04-13, Analyzed: 2021-04-14			
Aluminum, total	0.0583	0.0050 mg/L		0.0502			15	20	
Antimony, total	< 0.00020	0.00020 mg/L		< 0.00020				20	
Arsenic, total	0.00071	0.00050 mg/L		0.00060				20	
Barium, total	0.0268	0.0050 mg/L		0.0243			10	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	< 0.000010	0.000010 mg/L		< 0.000010				20	
Calcium, total	36.0	0.20 mg/L		32.8			9	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	0.00108	0.00040 mg/L		0.00104				20	
Iron, total	0.077	0.010 mg/L		0.070			9	20	
Lead, total	< 0.00020	0.00020 mg/L		< 0.00020				20	
Lithium, total	0.00387	0.00010 mg/L		0.00354			9	20	
Magnesium, total	11.4	0.010 mg/L		10.3			10	20	
Manganese, total	0.0168	0.00020 mg/L		0.0151			11	20	
Molybdenum, total	0.00381	0.00010 mg/L		0.00347			9	20	
Nickel, total	0.00053	0.00040 mg/L		0.00060				20	
Phosphorus, total	< 0.050	0.050 mg/L		< 0.050				20	
Potassium, total	2.77	0.10 mg/L		2.54			9	20	
Selenium, total	< 0.00050	0.00050 mg/L		< 0.00050				20	
Silicon, total	2.2	1.0 mg/L		2.1				20	
Silver, total	< 0.000050	0.000050 mg/L		< 0.000050				20	
Sodium, total	14.2	0.10 mg/L		12.8			10	20	
Strontium, total	0.329	0.0010 mg/L		0.296			10	20	
Sulfur, total	12.8	3.0 mg/L		12.2				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	0.00010 mg/L		< 0.00010				20	
Tin, total	< 0.00020	0.00020 mg/L		0.00233				20	
Titanium, total	< 0.0050	0.0050 mg/L		< 0.0050				20	
Tungsten, total	< 0.0010	0.0010 mg/L		< 0.0010				20	
Uranium, total	0.00280	0.000020 mg/L		0.00256			9	20	
Vanadium, total	< 0.0010	0.0010 mg/L		< 0.0010				20	
Zinc, total	< 0.0040	0.0040 mg/L		< 0.0040				20	
Zirconium, total	< 0.00010	0.00010 mg/L		< 0.00010				20	

Reference (B1D1047-SRM1)				Prepared: 2021-04-13, Analyzed: 2021-04-14					
Aluminum, total	0.298	0.0050 mg/L	0.299		100	70-130			
Antimony, total	0.0501	0.00020 mg/L	0.0517		97	70-130			
Arsenic, total	0.116	0.00050 mg/L	0.119		97	70-130			
Barium, total	0.743	0.0050 mg/L	0.801		93	70-130			
Beryllium, total	0.0470	0.00010 mg/L	0.0501		94	70-130			
Boron, total	3.77	0.0500 mg/L	4.11		92	70-130			
Cadmium, total	0.0482	0.000010 mg/L	0.0503		96	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21D0758
2021-04-15 13:56

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1D1047, Continued									
Reference (B1D1047-SRM1), Continued					Prepared: 2021-04-13, Analyzed: 2021-04-14				
Calcium, total	9.86	0.20 mg/L	10.7		92	70-130			
Chromium, total	0.248	0.00050 mg/L	0.250		99	70-130			
Cobalt, total	0.0387	0.00010 mg/L	0.0384		101	70-130			
Copper, total	0.510	0.00040 mg/L	0.487		105	70-130			
Iron, total	0.488	0.010 mg/L	0.504		97	70-130			
Lead, total	0.291	0.00020 mg/L	0.278		105	70-130			
Lithium, total	0.395	0.00010 mg/L	0.398		99	70-130			
Magnesium, total	3.77	0.010 mg/L	3.59		105	70-130			
Manganese, total	0.112	0.00020 mg/L	0.111		101	70-130			
Molybdenum, total	0.193	0.00010 mg/L	0.196		99	70-130			
Nickel, total	0.248	0.00040 mg/L	0.248		100	70-130			
Phosphorus, total	0.237	0.050 mg/L	0.213		111	70-130			
Potassium, total	5.98	0.10 mg/L	5.89		102	70-130			
Selenium, total	0.120	0.00050 mg/L	0.120		100	70-130			
Sodium, total	8.95	0.10 mg/L	8.71		103	70-130			
Strontium, total	0.354	0.0010 mg/L	0.393		90	70-130			
Thallium, total	0.0807	0.000020 mg/L	0.0787		103	70-130			
Uranium, total	0.0338	0.000020 mg/L	0.0344		98	70-130			
Vanadium, total	0.372	0.0010 mg/L	0.391		95	70-130			
Zinc, total	2.44	0.0040 mg/L	2.50		98	70-130			



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21E0984
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-05-10 15:33 / 12°C 2021-05-18 10:54
PO NUMBER	OK Falls (Vaseux Lake) via LAC	COC NUMBER	44174.36895
PROJECT	OK Falls (Vaseux Lake) via LAC		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

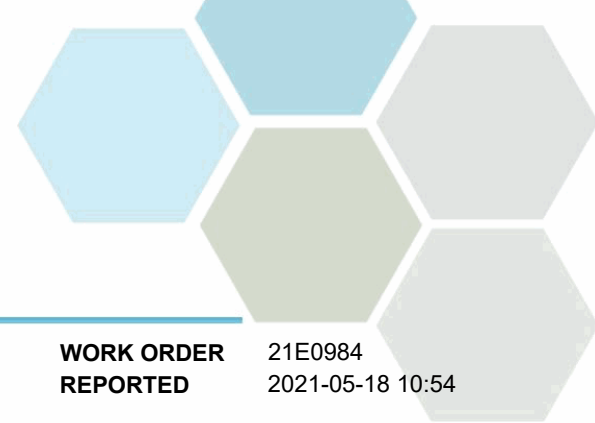
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21E0984
2021-05-18 10:54

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite (21E0984-01) | Matrix: Water | Sampled: 2021-05-10 11:00

Anions

Chloride	5.83	AO ≤ 250	0.10 mg/L	2021-05-12	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-05-12	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-05-12	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-05-12	
Sulfate	26.8	AO ≤ 500	1.0 mg/L	2021-05-12	

Calculated Parameters

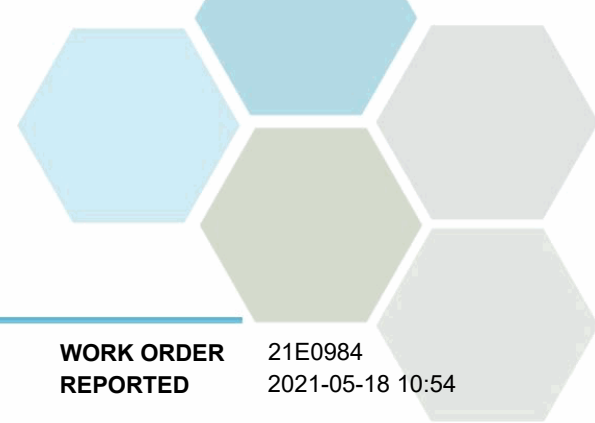
Hardness, Total (as CaCO3)	121	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.172	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.172	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.020	None Required	0.020 mg/L	2021-05-11	
Chlorophyll a	2.02	N/A	0.10 µg/L	2021-05-13	
Nitrogen, Total Kjeldahl	0.172	N/A	0.050 mg/L	2021-05-14	
Phosphorus, Total (as P)	0.0136	N/A	0.0050 mg/L	2021-05-14	
Phosphorus, Total Dissolved	0.0108	N/A	0.0050 mg/L	2021-05-14	

Total Metals

Aluminum, total	0.0432	OG < 0.1	0.0050 mg/L	2021-05-13	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-05-13	
Arsenic, total	0.00052	MAC = 0.01	0.00050 mg/L	2021-05-13	
Barium, total	0.0253	MAC = 2	0.0050 mg/L	2021-05-13	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-05-13	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-05-13	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-05-13	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-05-13	
Calcium, total	32.6	None Required	0.20 mg/L	2021-05-13	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-05-13	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-05-13	
Copper, total	0.00090	MAC = 2	0.00040 mg/L	2021-05-13	
Iron, total	0.047	AO ≤ 0.3	0.010 mg/L	2021-05-13	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-05-13	
Lithium, total	0.00355	N/A	0.00010 mg/L	2021-05-13	
Magnesium, total	9.65	None Required	0.010 mg/L	2021-05-13	
Manganese, total	0.00953	MAC = 0.12	0.00020 mg/L	2021-05-13	
Molybdenum, total	0.00344	N/A	0.00010 mg/L	2021-05-13	
Nickel, total	0.00050	N/A	0.00040 mg/L	2021-05-13	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-05-13	
Potassium, total	2.73	N/A	0.10 mg/L	2021-05-13	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-05-13	
Silicon, total	2.9	N/A	1.0 mg/L	2021-05-13	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-05-13	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10 m composite (21E0984-01) Matrix: Water Sampled: 2021-05-10 11:00, Continued					
<i>Total Metals, Continued</i>					
Sodium, total	12.4	AO ≤ 200	0.10 mg/L	2021-05-13	
Strontium, total	0.281	7	0.0010 mg/L	2021-05-13	
Sulfur, total	9.3	N/A	3.0 mg/L	2021-05-13	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-05-13	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-05-13	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-05-13	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-05-13	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-05-13	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-05-13	
Uranium, total	0.00255	MAC = 0.02	0.000020 mg/L	2021-05-13	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-05-13	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-05-13	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-05-13	

Vaseux 20, 22, 24 m composite (21E0984-02) | Matrix: Water | Sampled: 2021-05-10 11:15

Anions

Chloride	6.02	AO ≤ 250	0.10 mg/L	2021-05-13	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-05-13	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-05-13	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-05-13	
Sulfate	26.8	AO ≤ 500	1.0 mg/L	2021-05-13	

Calculated Parameters

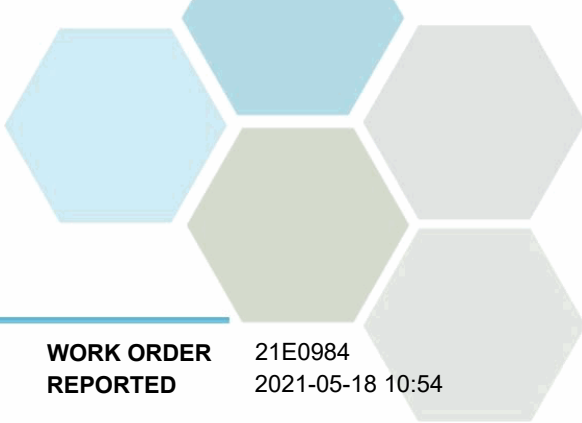
Hardness, Total (as CaCO3)	116	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.200	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.200	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.020	None Required	0.020 mg/L	2021-05-11	
Chlorophyll a	< 1.00	N/A	0.10 µg/L	2021-05-13	
Nitrogen, Total Kjeldahl	0.200	N/A	0.050 mg/L	2021-05-14	
Phosphorus, Total (as P)	0.0637	N/A	0.0050 mg/L	2021-05-14	
Phosphorus, Total Dissolved	0.0104	N/A	0.0050 mg/L	2021-05-14	

Total Metals

Aluminum, total	0.0348	OG < 0.1	0.0050 mg/L	2021-05-13	
Antimony, total	0.00022	MAC = 0.006	0.00020 mg/L	2021-05-13	
Arsenic, total	0.00052	MAC = 0.01	0.00050 mg/L	2021-05-13	
Barium, total	0.0251	MAC = 2	0.0050 mg/L	2021-05-13	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-05-13	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-05-13	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-05-13	

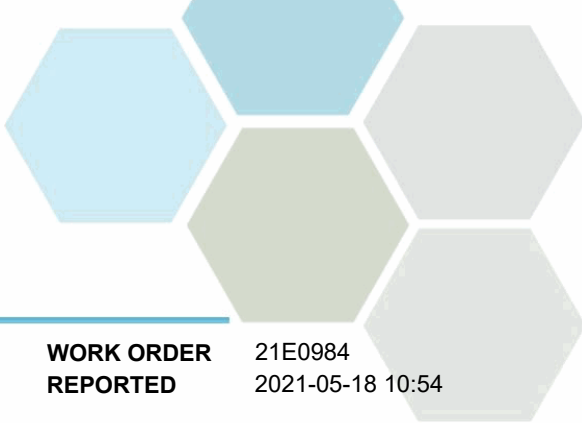


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21E0984
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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Vaseux 20, 22, 24 m composite (21E0984-02) Matrix: Water Sampled: 2021-05-10 11:15, Continued						
<i>Total Metals, Continued</i>						
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-05-13	
Calcium, total	31.0	None Required	0.20	mg/L	2021-05-13	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-05-13	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-05-13	
Copper, total	0.00074	MAC = 2	0.00040	mg/L	2021-05-13	
Iron, total	0.066	AO ≤ 0.3	0.010	mg/L	2021-05-13	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-05-13	
Lithium, total	0.00329	N/A	0.00010	mg/L	2021-05-13	
Magnesium, total	9.33	None Required	0.010	mg/L	2021-05-13	
Manganese, total	0.0248	MAC = 0.12	0.00020	mg/L	2021-05-13	
Molybdenum, total	0.00326	N/A	0.00010	mg/L	2021-05-13	
Nickel, total	0.00052	N/A	0.00040	mg/L	2021-05-13	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2021-05-13	
Potassium, total	2.63	N/A	0.10	mg/L	2021-05-13	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-05-13	
Silicon, total	2.8	N/A	1.0	mg/L	2021-05-13	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-05-13	
Sodium, total	11.9	AO ≤ 200	0.10	mg/L	2021-05-13	
Strontium, total	0.276	7	0.0010	mg/L	2021-05-13	
Sulfur, total	8.8	N/A	3.0	mg/L	2021-05-13	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-05-13	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-05-13	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-05-13	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-05-13	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-05-13	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-05-13	
Uranium, total	0.00239	MAC = 0.02	0.000020	mg/L	2021-05-13	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-05-13	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2021-05-13	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-05-13	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

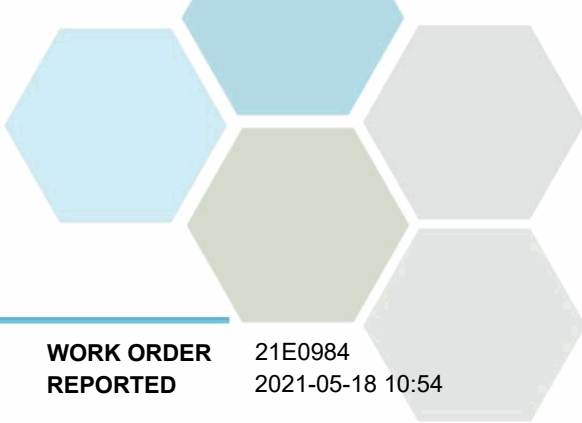
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

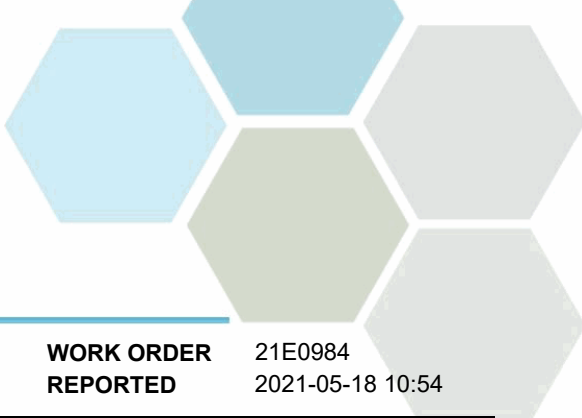
WORK ORDER REPORTED 21E0984
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General Comments:

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

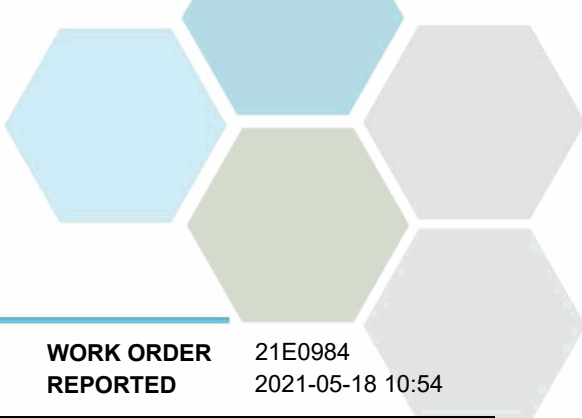
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC 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 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
Anions, Batch B1E0808									
Blank (B1E0808-BLK1)			Prepared: 2021-05-13, Analyzed: 2021-05-13						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
Blank (B1E0808-BLK2)			Prepared: 2021-05-13, Analyzed: 2021-05-13						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
LCS (B1E0808-BS1)			Prepared: 2021-05-13, Analyzed: 2021-05-13						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	3.94	0.010 mg/L	4.00		99	90-110			
Nitrite (as N)	1.94	0.010 mg/L	2.00		97	85-115			
Phosphate (as P)	1.11	0.0050 mg/L	1.00		111	80-120			
Sulfate	16.1	1.0 mg/L	16.0		101	90-110			
LCS (B1E0808-BS2)			Prepared: 2021-05-13, Analyzed: 2021-05-13						
Chloride	16.2	0.10 mg/L	16.0		101	90-110			
Nitrate (as N)	4.02	0.010 mg/L	4.00		101	90-110			
Nitrite (as N)	2.03	0.010 mg/L	2.00		101	85-115			
Phosphate (as P)	0.935	0.0050 mg/L	1.00		93	80-120			
Sulfate	16.1	1.0 mg/L	16.0		101	90-110			
Duplicate (B1E0808-DUP1)			Source: 21E0984-01		Prepared: 2021-05-12, Analyzed: 2021-05-12				
Chloride	5.85	0.10 mg/L		5.83			< 1	10	
Nitrate (as N)	< 0.010	0.010 mg/L		< 0.010				10	
Nitrite (as N)	< 0.010	0.010 mg/L		< 0.010				15	
Phosphate (as P)	< 0.0050	0.0050 mg/L		< 0.0050				20	
Sulfate	26.4	1.0 mg/L		26.8			2	10	
Matrix Spike (B1E0808-MS1)			Source: 21E0984-01		Prepared: 2021-05-13, Analyzed: 2021-05-13				
Chloride	21.5	0.10 mg/L	16.0	5.83	98	75-125			
Nitrate (as N)	3.79	0.010 mg/L	4.00	< 0.010	95	75-125			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls (Vaseux Lake) via LAC	WORK ORDER REPORTED	21E0984 2021-05-18 10:54
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B1E0808, Continued									
Matrix Spike (B1E0808-MS1), Continued		Source: 21E0984-01		Prepared: 2021-05-13, Analyzed: 2021-05-13					
Nitrite (as N)	2.08	0.010 mg/L	2.00	< 0.010	104	80-120			
Phosphate (as P)	0.953	0.0050 mg/L	1.00	< 0.0050	95	70-130			
Sulfate	41.1	1.0 mg/L	16.0	26.8	90	75-125			

General Parameters, Batch B1E0497

Blank (B1E0497-BLK1)		Prepared: 2021-05-06, Analyzed: 2021-05-13							
Chlorophyll a	< 0.10	0.10 µg/L							

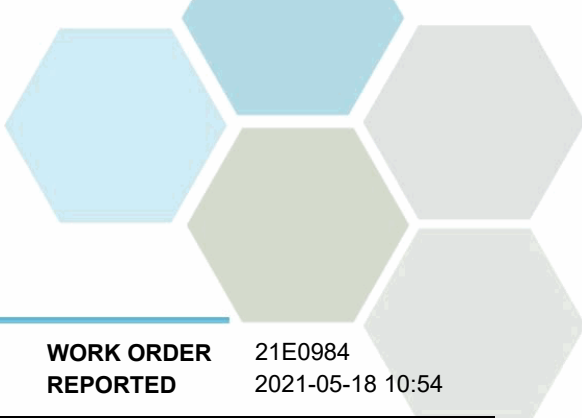
General Parameters, Batch B1E0950

Blank (B1E0950-BLK1)		Prepared: 2021-05-11, Analyzed: 2021-05-11							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1E0950-BLK2)		Prepared: 2021-05-11, Analyzed: 2021-05-11							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1E0950-BLK3)		Prepared: 2021-05-11, Analyzed: 2021-05-11							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1E0950-BLK4)		Prepared: 2021-05-11, Analyzed: 2021-05-11							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
LCS (B1E0950-BS1)		Prepared: 2021-05-11, Analyzed: 2021-05-11							
Ammonia, Total (as N)	1.07	0.020 mg/L	1.00		107	90-115			
LCS (B1E0950-BS2)		Prepared: 2021-05-11, Analyzed: 2021-05-11							
Ammonia, Total (as N)	1.08	0.020 mg/L	1.00		108	90-115			
LCS (B1E0950-BS3)		Prepared: 2021-05-11, Analyzed: 2021-05-11							
Ammonia, Total (as N)	1.09	0.020 mg/L	1.00		109	90-115			
LCS (B1E0950-BS4)		Prepared: 2021-05-11, Analyzed: 2021-05-11							
Ammonia, Total (as N)	1.08	0.020 mg/L	1.00		108	90-115			

General Parameters, Batch B1E1314

Blank (B1E1314-BLK1)		Prepared: 2021-05-13, Analyzed: 2021-05-14							
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B1E1314-BLK2)		Prepared: 2021-05-13, Analyzed: 2021-05-14							
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1E1314-BS1)		Prepared: 2021-05-13, Analyzed: 2021-05-14							
Nitrogen, Total Kjeldahl	1.04	0.050 mg/L	1.00		104	85-115			
LCS (B1E1314-BS2)		Prepared: 2021-05-13, Analyzed: 2021-05-14							
Nitrogen, Total Kjeldahl	1.02	0.050 mg/L	1.00		102	85-115			
Duplicate (B1E1314-DUP1)		Source: 21E0984-02		Prepared: 2021-05-13, Analyzed: 2021-05-14					
Nitrogen, Total Kjeldahl	0.206	0.050 mg/L		0.200				15	
Matrix Spike (B1E1314-MS1)		Source: 21E0984-02		Prepared: 2021-05-13, Analyzed: 2021-05-14					
Nitrogen, Total Kjeldahl	2.20	0.100 mg/L	2.00	0.200	100	65-135			

General Parameters, Batch B1E1379

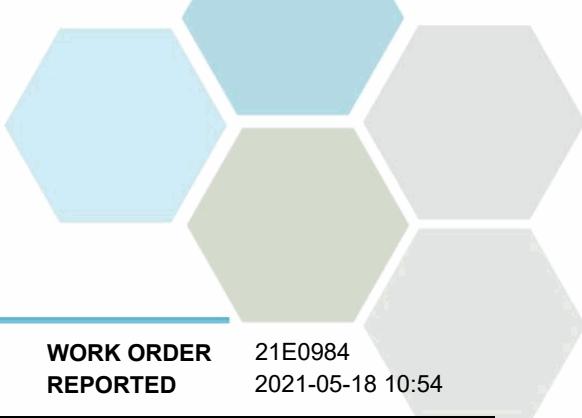


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21E0984
2021-05-18 10:54

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1E1379, Continued									
Blank (B1E1379-BLK1)			Prepared: 2021-05-13, Analyzed: 2021-05-14						
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
LCS (B1E1379-BS1)			Prepared: 2021-05-13, Analyzed: 2021-05-14						
Phosphorus, Total (as P)	0.103	0.0050 mg/L	0.100		103	85-115			
Total Metals, Batch B1E1179									
Blank (B1E1179-BLK1)			Prepared: 2021-05-12, Analyzed: 2021-05-13						
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B1E1179-BS1)			Prepared: 2021-05-12, Analyzed: 2021-05-13						
Aluminum, total	0.0217	0.0050 mg/L	0.0199		109	80-120			
Antimony, total	0.0203	0.00020 mg/L	0.0200		102	80-120			
Arsenic, total	0.0198	0.00050 mg/L	0.0200		99	80-120			
Barium, total	0.0199	0.0050 mg/L	0.0198		101	80-120			
Beryllium, total	0.0201	0.00010 mg/L	0.0198		102	80-120			
Bismuth, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		97	80-120			
Cadmium, total	0.0198	0.000010 mg/L	0.0199		99	80-120			
Calcium, total	2.13	0.20 mg/L	2.02		105	80-120			



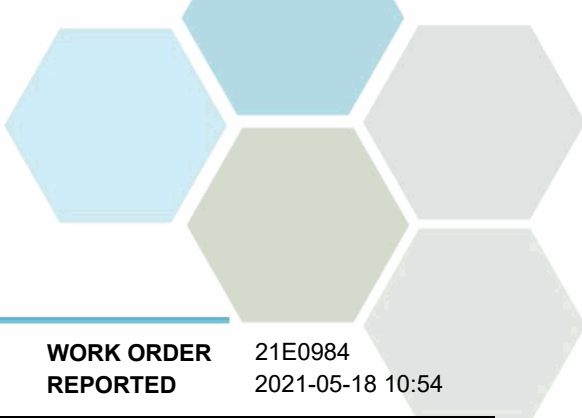
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21E0984
2021-05-18 10:54

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1E1179, Continued									
LCS (B1E1179-BS1), Continued					Prepared: 2021-05-12, Analyzed: 2021-05-13				
Chromium, total	0.0201	0.00050 mg/L	0.0198		102	80-120			
Cobalt, total	0.0201	0.00010 mg/L	0.0199		101	80-120			
Copper, total	0.0197	0.00040 mg/L	0.0200		99	80-120			
Iron, total	1.96	0.010 mg/L	2.02		97	80-120			
Lead, total	0.0200	0.00020 mg/L	0.0199		100	80-120			
Lithium, total	0.0199	0.00010 mg/L	0.0200		100	80-120			
Magnesium, total	2.00	0.010 mg/L	2.02		99	80-120			
Manganese, total	0.0185	0.00020 mg/L	0.0199		93	80-120			
Molybdenum, total	0.0191	0.00010 mg/L	0.0200		96	80-120			
Nickel, total	0.0201	0.00040 mg/L	0.0200		101	80-120			
Phosphorus, total	1.88	0.050 mg/L	2.00		94	80-120			
Potassium, total	2.09	0.10 mg/L	2.02		103	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		98	80-120			
Silver, total	0.0189	0.000050 mg/L	0.0200		95	80-120			
Sodium, total	2.15	0.10 mg/L	2.02		106	80-120			
Strontium, total	0.0179	0.0010 mg/L	0.0200		89	80-120			
Sulfur, total	5.0	3.0 mg/L	5.00		101	80-120			
Tellurium, total	0.0197	0.00050 mg/L	0.0200		98	80-120			
Thallium, total	0.0191	0.000020 mg/L	0.0199		96	80-120			
Thorium, total	0.0190	0.00010 mg/L	0.0200		95	80-120			
Tin, total	0.0201	0.00020 mg/L	0.0200		100	80-120			
Titanium, total	0.0213	0.0050 mg/L	0.0200		106	80-120			
Tungsten, total	0.0207	0.0010 mg/L	0.0200		103	80-120			
Uranium, total	0.0189	0.000020 mg/L	0.0200		94	80-120			
Vanadium, total	0.0195	0.0010 mg/L	0.0200		97	80-120			
Zinc, total	0.0220	0.0040 mg/L	0.0200		110	80-120			
Zirconium, total	0.0201	0.00010 mg/L	0.0200		101	80-120			

Duplicate (B1E1179-DUP1)		Source: 21E0984-02		Prepared: 2021-05-12, Analyzed: 2021-05-13					
Aluminum, total	0.0348	0.0050 mg/L		0.0348			< 1	20	
Antimony, total	< 0.00020	0.00020 mg/L		0.00022				20	
Arsenic, total	< 0.00050	0.00050 mg/L		0.00052				20	
Barium, total	0.0270	0.0050 mg/L		0.0251			7	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	< 0.000010	0.000010 mg/L		< 0.000010				20	
Calcium, total	32.4	0.20 mg/L		31.0			4	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	0.00067	0.00040 mg/L		0.00074				20	
Iron, total	0.065	0.010 mg/L		0.066			< 1	20	
Lead, total	< 0.00020	0.00020 mg/L		< 0.00020				20	
Lithium, total	0.00337	0.00010 mg/L		0.00329			2	20	
Magnesium, total	9.52	0.010 mg/L		9.33			2	20	
Manganese, total	0.0252	0.00020 mg/L		0.0248			2	20	
Molybdenum, total	0.00348	0.00010 mg/L		0.00326			7	20	
Nickel, total	0.00053	0.00040 mg/L		0.00052				20	
Phosphorus, total	< 0.050	0.050 mg/L		< 0.050				20	
Potassium, total	2.71	0.10 mg/L		2.63			3	20	
Selenium, total	< 0.00050	0.00050 mg/L		< 0.00050				20	
Silicon, total	2.6	1.0 mg/L		2.8				20	
Silver, total	< 0.000050	0.000050 mg/L		< 0.000050				20	
Sodium, total	12.2	0.10 mg/L		11.9			3	20	
Strontium, total	0.282	0.0010 mg/L		0.276			2	20	



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21E0984
2021-05-18 10:54

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1E1179, Continued									
Duplicate (B1E1179-DUP1), Continued			Source: 21E0984-02		Prepared: 2021-05-12, Analyzed: 2021-05-13				
Sulfur, total	9.4	3.0 mg/L		8.8				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	0.00010 mg/L		< 0.00010				20	
Tin, total	< 0.00020	0.00020 mg/L		< 0.00020				20	
Titanium, total	< 0.0050	0.0050 mg/L		< 0.0050				20	
Tungsten, total	< 0.0010	0.0010 mg/L		< 0.0010				20	
Uranium, total	0.00258	0.000020 mg/L		0.00239			8	20	
Vanadium, total	< 0.0010	0.0010 mg/L		< 0.0010				20	
Zinc, total	< 0.0040	0.0040 mg/L		< 0.0040				20	
Zirconium, total	< 0.00010	0.00010 mg/L		< 0.00010				20	

Reference (B1E1179-SRM1)				Prepared: 2021-05-12, Analyzed: 2021-05-13					
Aluminum, total	0.291	0.0050 mg/L	0.299	97	70-130				
Antimony, total	0.0528	0.00020 mg/L	0.0517	102	70-130				
Arsenic, total	0.128	0.00050 mg/L	0.119	107	70-130				
Barium, total	0.808	0.0050 mg/L	0.801	101	70-130				
Beryllium, total	0.0518	0.00010 mg/L	0.0501	103	70-130				
Boron, total	3.81	0.0500 mg/L	4.11	93	70-130				
Cadmium, total	0.0514	0.000010 mg/L	0.0503	102	70-130				
Calcium, total	10.1	0.20 mg/L	10.7	95	70-130				
Chromium, total	0.261	0.00050 mg/L	0.250	104	70-130				
Cobalt, total	0.0406	0.00010 mg/L	0.0384	106	70-130				
Copper, total	0.506	0.00040 mg/L	0.487	104	70-130				
Iron, total	0.508	0.010 mg/L	0.504	101	70-130				
Lead, total	0.272	0.00020 mg/L	0.278	98	70-130				
Lithium, total	0.409	0.00010 mg/L	0.398	103	70-130				
Magnesium, total	3.78	0.010 mg/L	3.59	105	70-130				
Manganese, total	0.105	0.00020 mg/L	0.111	95	70-130				
Molybdenum, total	0.200	0.00010 mg/L	0.196	102	70-130				
Nickel, total	0.261	0.00040 mg/L	0.248	105	70-130				
Phosphorus, total	0.218	0.050 mg/L	0.213	102	70-130				
Potassium, total	6.56	0.10 mg/L	5.89	111	70-130				
Selenium, total	0.128	0.00050 mg/L	0.120	106	70-130				
Sodium, total	9.67	0.10 mg/L	8.71	111	70-130				
Strontium, total	0.362	0.0010 mg/L	0.393	92	70-130				
Thallium, total	0.0779	0.000020 mg/L	0.0787	99	70-130				
Uranium, total	0.0337	0.000020 mg/L	0.0344	98	70-130				
Vanadium, total	0.402	0.0010 mg/L	0.391	103	70-130				
Zinc, total	2.76	0.0040 mg/L	2.50	111	70-130				



CERTIFICATE OF ANALYSIS

REPORTED TO Regional District of Okanagan Similkameen
101 Martin Street
Penticton, BC V2A 5J9

ATTENTION Rina Seppen

PO NUMBER OK Falls (Vaseux Lake) via LAC

PROJECT OK Falls (Vaseux Lake) via LAC

PROJECT INFO

WORK ORDER 21F0621

RECEIVED / TEMP 2021-06-03 14:02 / 16.5°C

REPORTED 2021-06-14 12:03

COC NUMBER 44174.36895

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.

Work Order Comments:

Custody Seals Intact: YES

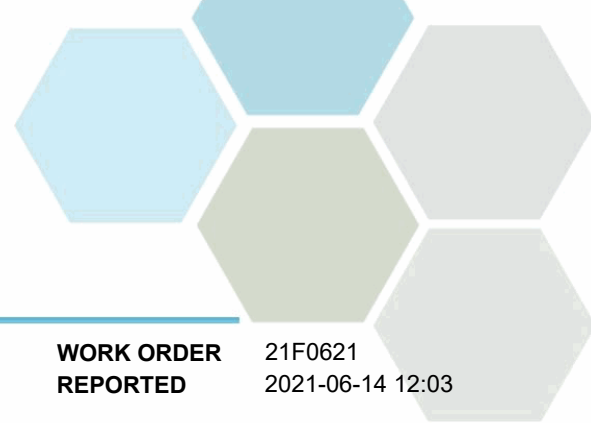
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21F0621
2021-06-14 12:03

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10m Composite - WT 3348 (21F0621-01) | Matrix: Water | Sampled: 2021-06-03 10:00

Anions

Chloride	5.96	AO ≤ 250	0.10 mg/L	2021-06-04	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-06-04	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-06-04	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-06-04	
Sulfate	26.8	AO ≤ 500	1.0 mg/L	2021-06-04	

Calculated Parameters

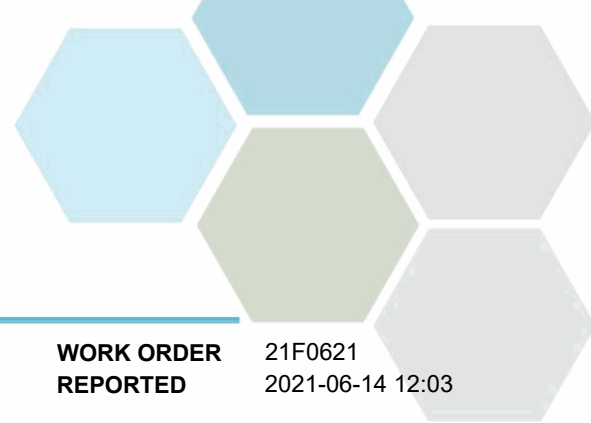
Hardness, Total (as CaCO3)	118	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.443	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.443	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.020	None Required	0.020 mg/L	2021-06-08	
Chlorophyll a	1.07	N/A	0.10 µg/L	2021-06-08	
Nitrogen, Total Kjeldahl	0.443	N/A	0.050 mg/L	2021-06-08	
Phosphorus, Total (as P)	0.0119	N/A	0.0050 mg/L	2021-06-09	
Phosphorus, Total Dissolved	0.0074	N/A	0.0050 mg/L	2021-06-09	

Total Metals

Aluminum, total	0.0210	OG < 0.1	0.0050 mg/L	2021-06-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-06-11	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050 mg/L	2021-06-11	
Barium, total	0.0240	MAC = 2	0.0050 mg/L	2021-06-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-06-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-06-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-06-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-06-11	
Calcium, total	32.0	None Required	0.20 mg/L	2021-06-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-06-11	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-06-11	
Copper, total	0.00090	MAC = 2	0.00040 mg/L	2021-06-11	
Iron, total	0.035	AO ≤ 0.3	0.010 mg/L	2021-06-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-06-11	
Lithium, total	0.00332	N/A	0.00010 mg/L	2021-06-11	
Magnesium, total	9.22	None Required	0.010 mg/L	2021-06-11	
Manganese, total	0.00728	MAC = 0.12	0.00020 mg/L	2021-06-11	
Molybdenum, total	0.00322	N/A	0.00010 mg/L	2021-06-11	
Nickel, total	0.00062	N/A	0.00040 mg/L	2021-06-11	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-06-11	
Potassium, total	2.35	N/A	0.10 mg/L	2021-06-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-06-11	
Silicon, total	2.8	N/A	1.0 mg/L	2021-06-11	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-06-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21F0621
2021-06-14 12:03

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10m Composite - WT 3348 (21F0621-01) | Matrix: Water | Sampled: 2021-06-03 10:00, Continued

Total Metals, Continued

Sodium, total	11.8	AO ≤ 200	0.10 mg/L	2021-06-11	
Strontium, total	0.291	7	0.0010 mg/L	2021-06-11	
Sulfur, total	10.5	N/A	3.0 mg/L	2021-06-11	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-06-11	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-06-11	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-06-11	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-06-11	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-06-11	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-06-11	
Uranium, total	0.00248	MAC = 0.02	0.000020 mg/L	2021-06-11	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-06-11	
Zinc, total	0.0067	AO ≤ 5	0.0040 mg/L	2021-06-11	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-06-11	

Vaseux 20, 22, 24m Composite - WT 3349 (21F0621-02) | Matrix: Water | Sampled: 2021-06-03 10:30

Anions

Chloride	6.30	AO ≤ 250	0.10 mg/L	2021-06-04	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-06-04	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-06-04	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-06-04	
Sulfate	27.7	AO ≤ 500	1.0 mg/L	2021-06-04	

Calculated Parameters

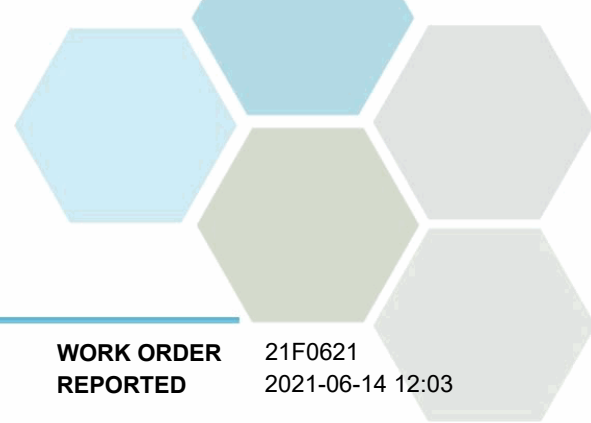
Hardness, Total (as CaCO3)	124	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.240	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.192	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.048	None Required	0.020 mg/L	2021-06-08	
Chlorophyll a	1.71	N/A	0.10 µg/L	2021-06-08	
Nitrogen, Total Kjeldahl	0.240	N/A	0.050 mg/L	2021-06-08	
Phosphorus, Total (as P)	0.0282	N/A	0.0050 mg/L	2021-06-09	
Phosphorus, Total Dissolved	0.0097	N/A	0.0050 mg/L	2021-06-09	

Total Metals

Aluminum, total	0.0653	OG < 0.1	0.0050 mg/L	2021-06-12	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-06-12	
Arsenic, total	0.00057	MAC = 0.01	0.00050 mg/L	2021-06-12	
Barium, total	0.0282	MAC = 2	0.0050 mg/L	2021-06-12	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-06-12	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-06-12	

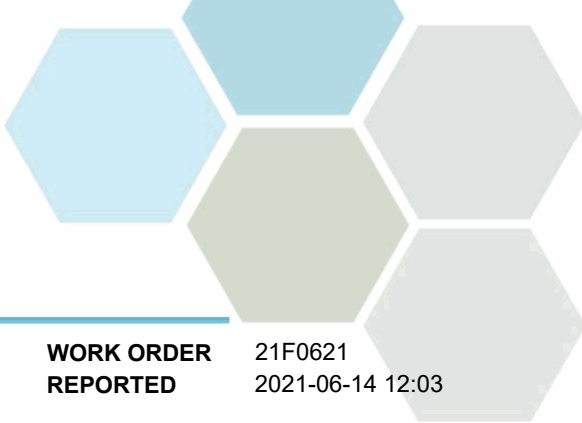


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21F0621
2021-06-14 12:03

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 20, 22, 24m Composite - WT 3349 (21F0621-02) Matrix: Water Sampled: 2021-06-03 10:30, Continued					
<i>Total Metals, Continued</i>					
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-06-12	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-06-12	
Calcium, total	33.8	None Required	0.20 mg/L	2021-06-12	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-06-12	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-06-12	
Copper, total	0.00067	MAC = 2	0.00040 mg/L	2021-06-12	
Iron, total	0.178	AO ≤ 0.3	0.010 mg/L	2021-06-12	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-06-12	
Lithium, total	0.00348	N/A	0.00010 mg/L	2021-06-12	
Magnesium, total	9.58	None Required	0.010 mg/L	2021-06-12	
Manganese, total	0.107	MAC = 0.12	0.00020 mg/L	2021-06-12	
Molybdenum, total	0.00537	N/A	0.00010 mg/L	2021-06-12	
Nickel, total	0.00094	N/A	0.00040 mg/L	2021-06-12	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-06-12	
Potassium, total	2.55	N/A	0.10 mg/L	2021-06-12	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-06-12	
Silicon, total	3.2	N/A	1.0 mg/L	2021-06-12	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-06-12	
Sodium, total	12.2	AO ≤ 200	0.10 mg/L	2021-06-12	
Strontium, total	0.305	7	0.0010 mg/L	2021-06-12	
Sulfur, total	9.0	N/A	3.0 mg/L	2021-06-12	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-06-12	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-06-12	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-06-12	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-06-12	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-06-12	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-06-12	
Uranium, total	0.00255	MAC = 0.02	0.000020 mg/L	2021-06-12	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-06-12	
Zinc, total	0.0057	AO ≤ 5	0.0040 mg/L	2021-06-12	
Zirconium, total	0.00028	N/A	0.00010 mg/L	2021-06-12	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

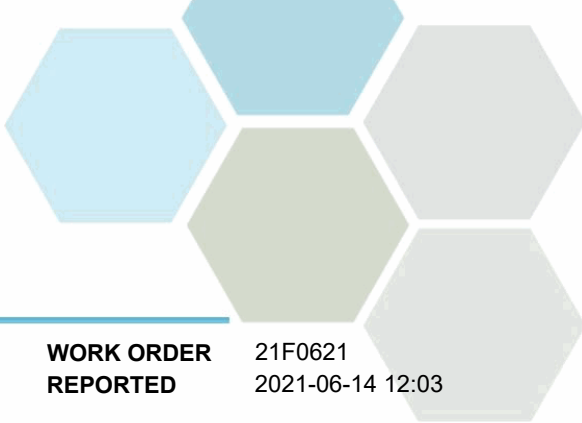
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

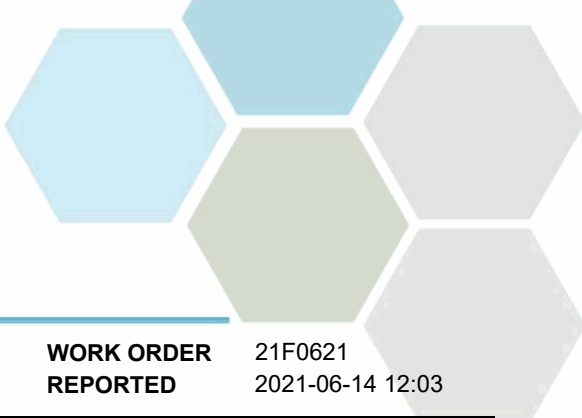
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General Comments:

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

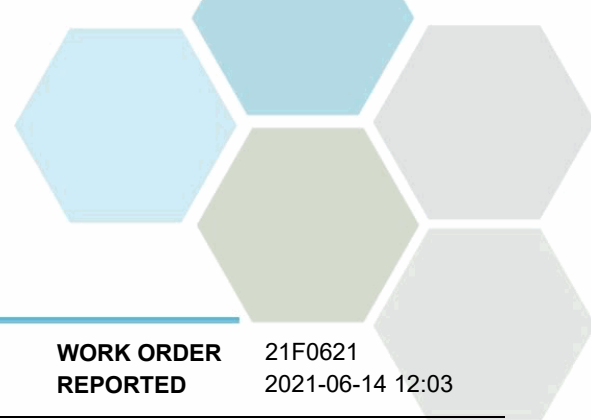
WORK ORDER REPORTED 21F0621
2021-06-14 12:03

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 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
Anions, Batch B1F0580									
Blank (B1F0580-BLK1)			Prepared: 2021-06-04, Analyzed: 2021-06-04						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
Blank (B1F0580-BLK2)			Prepared: 2021-06-04, Analyzed: 2021-06-04						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
Blank (B1F0580-BLK3)			Prepared: 2021-06-04, Analyzed: 2021-06-04						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
LCS (B1F0580-BS1)			Prepared: 2021-06-04, Analyzed: 2021-06-04						
Chloride	16.1	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	3.92	0.010 mg/L	4.00		98	90-110			
Nitrite (as N)	2.04	0.010 mg/L	2.00		102	85-115			
Phosphate (as P)	1.06	0.0050 mg/L	1.00		106	80-120			
Sulfate	16.4	1.0 mg/L	16.0		102	90-110			
LCS (B1F0580-BS2)			Prepared: 2021-06-04, Analyzed: 2021-06-04						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	3.93	0.010 mg/L	4.00		98	90-110			
Nitrite (as N)	2.01	0.010 mg/L	2.00		100	85-115			
Phosphate (as P)	0.958	0.0050 mg/L	1.00		96	80-120			
Sulfate	16.3	1.0 mg/L	16.0		102	90-110			
LCS (B1F0580-BS3)			Prepared: 2021-06-04, Analyzed: 2021-06-04						
Chloride	16.1	0.10 mg/L	16.0		101	90-110			
Nitrate (as N)	4.04	0.010 mg/L	4.00		101	90-110			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls (Vaseux Lake) via LAC	WORK ORDER REPORTED	21F0621 2021-06-14 12:03
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Anions, Batch B1F0580, Continued

LCS (B1F0580-BS3), Continued			Prepared: 2021-06-04, Analyzed: 2021-06-04						
Nitrite (as N)	1.90	0.010 mg/L	2.00		95	85-115			
Phosphate (as P)	1.11	0.0050 mg/L	1.00		111	80-120			
Sulfate	16.3	1.0 mg/L	16.0		102	90-110			

Duplicate (B1F0580-DUP2)			Source: 21F0621-01		Prepared: 2021-06-04, Analyzed: 2021-06-04				
Chloride	5.94	0.10 mg/L		5.96			< 1	10	
Nitrate (as N)	< 0.010	0.010 mg/L		< 0.010				10	
Nitrite (as N)	< 0.010	0.010 mg/L		< 0.010				15	
Phosphate (as P)	< 0.0050	0.0050 mg/L		< 0.0050				20	
Sulfate	27.8	1.0 mg/L		26.8			4	10	

Matrix Spike (B1F0580-MS2)			Source: 21F0621-01		Prepared: 2021-06-04, Analyzed: 2021-06-04				
Chloride	21.4	0.10 mg/L	16.0	5.96	96	75-125			
Nitrate (as N)	3.92	0.010 mg/L	4.00	< 0.010	98	75-125			
Nitrite (as N)	2.01	0.010 mg/L	2.00	< 0.010	100	80-120			
Phosphate (as P)	0.918	0.0050 mg/L	1.00	< 0.0050	92	70-130			
Sulfate	43.4	1.0 mg/L	16.0	26.8	104	75-125			

General Parameters, Batch B1F0171

Blank (B1F0171-BLK1)			Prepared: 2021-06-01, Analyzed: 2021-06-08						
Chlorophyll a	< 0.10	0.10 µg/L							

General Parameters, Batch B1F0792

Blank (B1F0792-BLK1)			Prepared: 2021-06-07, Analyzed: 2021-06-08						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							

Blank (B1F0792-BLK2)			Prepared: 2021-06-07, Analyzed: 2021-06-08						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							

LCS (B1F0792-BS1)			Prepared: 2021-06-07, Analyzed: 2021-06-08						
Nitrogen, Total Kjeldahl	1.15	0.050 mg/L	1.00		115	85-115			

LCS (B1F0792-BS2)			Prepared: 2021-06-07, Analyzed: 2021-06-08						
Nitrogen, Total Kjeldahl	1.13	0.050 mg/L	1.00		113	85-115			

General Parameters, Batch B1F0844

Blank (B1F0844-BLK1)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							

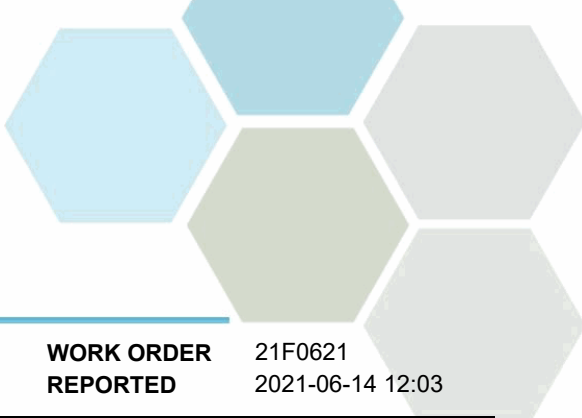
Blank (B1F0844-BLK2)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							

Blank (B1F0844-BLK3)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							

Blank (B1F0844-BLK4)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							

Blank (B1F0844-BLK5)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							

Blank (B1F0844-BLK6)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							

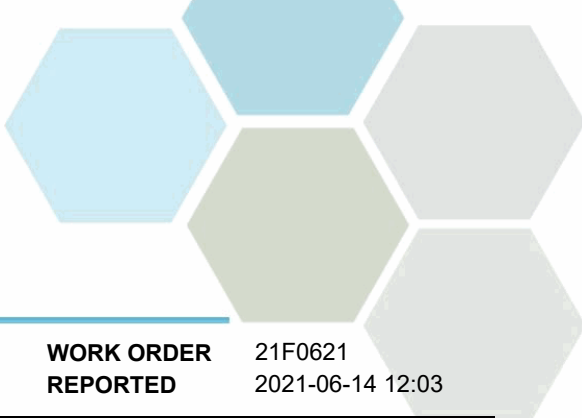


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21F0621
2021-06-14 12:03

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1F0844, Continued									
LCS (B1F0844-BS1)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	0.974	0.020 mg/L	1.00		97	90-115			
LCS (B1F0844-BS2)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	0.969	0.020 mg/L	1.00		97	90-115			
LCS (B1F0844-BS3)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	0.934	0.020 mg/L	1.00		93	90-115			
LCS (B1F0844-BS4)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	0.958	0.020 mg/L	1.00		96	90-115			
LCS (B1F0844-BS5)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	0.939	0.020 mg/L	1.00		94	90-115			
LCS (B1F0844-BS6)			Prepared: 2021-06-08, Analyzed: 2021-06-08						
Ammonia, Total (as N)	0.944	0.020 mg/L	1.00		94	90-115			
General Parameters, Batch B1F0982									
Blank (B1F0982-BLK1)			Prepared: 2021-06-08, Analyzed: 2021-06-09						
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
Blank (B1F0982-BLK2)			Prepared: 2021-06-08, Analyzed: 2021-06-09						
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
LCS (B1F0982-BS1)			Prepared: 2021-06-08, Analyzed: 2021-06-09						
Phosphorus, Total (as P)	0.110	0.0050 mg/L	0.100		110	85-115			
Phosphorus, Total Dissolved	0.110	0.0050 mg/L	0.100		110	85-115			
LCS (B1F0982-BS2)			Prepared: 2021-06-08, Analyzed: 2021-06-09						
Phosphorus, Total (as P)	0.113	0.0050 mg/L	0.100		113	85-115			
Phosphorus, Total Dissolved	0.115	0.0050 mg/L	0.100		115	85-115			
Duplicate (B1F0982-DUP1)			Source: 21F0621-02		Prepared: 2021-06-08, Analyzed: 2021-06-09				
Phosphorus, Total (as P)	0.0269	0.0050 mg/L		0.0282			5	15	
Phosphorus, Total Dissolved	0.0091	0.0050 mg/L		0.0097				15	
Matrix Spike (B1F0982-MS1)			Source: 21F0621-02		Prepared: 2021-06-08, Analyzed: 2021-06-09				
Phosphorus, Total (as P)	0.131	0.0050 mg/L	0.102	0.0282	101	70-125			
Phosphorus, Total Dissolved	0.122	0.0050 mg/L	0.102	0.0097	110	70-125			
Total Metals, Batch B1F1385									
Blank (B1F1385-BLK1)			Prepared: 2021-06-11, Analyzed: 2021-06-13						
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							



APPENDIX 2: QUALITY CONTROL RESULTS

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OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21F0621
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1F1385, Continued

Blank (B1F1385-BLK1), Continued

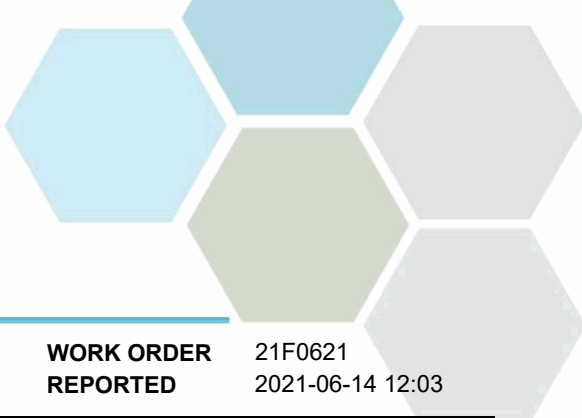
Prepared: 2021-06-11, Analyzed: 2021-06-13

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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B1F1385-BS1)

Prepared: 2021-06-11, Analyzed: 2021-06-11

Aluminum, total	0.0236	0.0050 mg/L	0.0199		119	80-120			
Antimony, total	0.0197	0.00020 mg/L	0.0200		99	80-120			
Arsenic, total	0.0196	0.00050 mg/L	0.0200		98	80-120			
Barium, total	0.0197	0.0050 mg/L	0.0198		100	80-120			
Beryllium, total	0.0197	0.00010 mg/L	0.0198		100	80-120			
Bismuth, total	0.0201	0.00010 mg/L	0.0200		101	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		114	80-120			
Cadmium, total	0.0196	0.000010 mg/L	0.0199		98	80-120			
Calcium, total	2.22	0.20 mg/L	2.02		110	80-120			
Chromium, total	0.0196	0.00050 mg/L	0.0198		99	80-120			
Cobalt, total	0.0195	0.00010 mg/L	0.0199		98	80-120			
Copper, total	0.0195	0.00040 mg/L	0.0200		97	80-120			
Iron, total	1.88	0.010 mg/L	2.02		93	80-120			
Lead, total	0.0204	0.00020 mg/L	0.0199		103	80-120			
Lithium, total	0.0200	0.00010 mg/L	0.0200		100	80-120			
Magnesium, total	2.00	0.010 mg/L	2.02		99	80-120			
Manganese, total	0.0194	0.00020 mg/L	0.0199		98	80-120			
Molybdenum, total	0.0186	0.00010 mg/L	0.0200		93	80-120			
Nickel, total	0.0204	0.00040 mg/L	0.0200		102	80-120			
Phosphorus, total	1.98	0.050 mg/L	2.00		99	80-120			
Potassium, total	1.88	0.10 mg/L	2.02		93	80-120			
Selenium, total	0.0191	0.00050 mg/L	0.0200		96	80-120			
Silicon, total	2.1	1.0 mg/L	2.00		106	80-120			
Silver, total	0.0200	0.000050 mg/L	0.0200		100	80-120			
Sodium, total	1.96	0.10 mg/L	2.02		97	80-120			
Strontium, total	0.0192	0.0010 mg/L	0.0200		96	80-120			
Sulfur, total	4.3	3.0 mg/L	5.00		86	80-120			
Tellurium, total	0.0186	0.00050 mg/L	0.0200		93	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

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WORK ORDER REPORTED 21F0621
2021-06-14 12:03

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1F1385, Continued									
LCS (B1F1385-BS1), Continued					Prepared: 2021-06-11, Analyzed: 2021-06-11				
Thallium, total	0.0202	0.000020 mg/L	0.0199		102	80-120			
Thorium, total	0.0202	0.00010 mg/L	0.0200		101	80-120			
Tin, total	0.0193	0.00020 mg/L	0.0200		97	80-120			
Titanium, total	0.0196	0.0050 mg/L	0.0200		98	80-120			
Tungsten, total	0.0195	0.0010 mg/L	0.0200		97	80-120			
Uranium, total	0.0202	0.000020 mg/L	0.0200		101	80-120			
Vanadium, total	0.0195	0.0010 mg/L	0.0200		97	80-120			
Zinc, total	0.0232	0.0040 mg/L	0.0200		116	80-120			
Zirconium, total	0.0195	0.00010 mg/L	0.0200		97	80-120			
Reference (B1F1385-SRM1)					Prepared: 2021-06-11, Analyzed: 2021-06-11				
Aluminum, total	0.289	0.0050 mg/L	0.299		97	70-130			
Antimony, total	0.0485	0.00020 mg/L	0.0517		94	70-130			
Arsenic, total	0.122	0.00050 mg/L	0.119		102	70-130			
Barium, total	0.785	0.0050 mg/L	0.801		98	70-130			
Beryllium, total	0.0493	0.00010 mg/L	0.0501		98	70-130			
Boron, total	3.66	0.0500 mg/L	4.11		89	70-130			
Cadmium, total	0.0484	0.000010 mg/L	0.0503		96	70-130			
Calcium, total	10.3	0.20 mg/L	10.7		97	70-130			
Chromium, total	0.243	0.00050 mg/L	0.250		97	70-130			
Cobalt, total	0.0378	0.00010 mg/L	0.0384		98	70-130			
Copper, total	0.470	0.00040 mg/L	0.487		97	70-130			
Iron, total	0.477	0.010 mg/L	0.504		95	70-130			
Lead, total	0.279	0.00020 mg/L	0.278		100	70-130			
Lithium, total	0.392	0.00010 mg/L	0.398		98	70-130			
Magnesium, total	3.67	0.010 mg/L	3.59		102	70-130			
Manganese, total	0.104	0.00020 mg/L	0.111		94	70-130			
Molybdenum, total	0.184	0.00010 mg/L	0.196		94	70-130			
Nickel, total	0.244	0.00040 mg/L	0.248		98	70-130			
Phosphorus, total	0.229	0.050 mg/L	0.213		108	70-130			
Potassium, total	5.69	0.10 mg/L	5.89		97	70-130			
Selenium, total	0.118	0.00050 mg/L	0.120		99	70-130			
Sodium, total	8.48	0.10 mg/L	8.71		97	70-130			
Strontium, total	0.374	0.0010 mg/L	0.393		95	70-130			
Thallium, total	0.0788	0.000020 mg/L	0.0787		100	70-130			
Uranium, total	0.0343	0.000020 mg/L	0.0344		100	70-130			
Vanadium, total	0.375	0.0010 mg/L	0.391		96	70-130			
Zinc, total	2.56	0.0040 mg/L	2.50		103	70-130			



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21G0445
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-07-06 13:27 / 16.0°C
PO NUMBER	OK Falls (Vaseux Lake) via LAC	REPORTED	2021-07-13 11:51
PROJECT	OK Falls (Vaseux Lake) via LAC	COC NUMBER	44376.36716
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

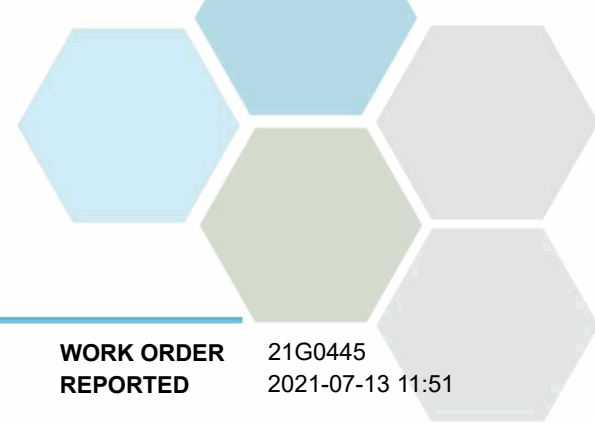
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite (21G0445-01) | Matrix: Water | Sampled: 2021-07-06 09:30

Anions

Chloride	5.43	AO ≤ 250	0.10 mg/L	2021-07-07	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-07-07	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-07-07	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-07-07	
Sulfate	28.8	AO ≤ 500	1.0 mg/L	2021-07-07	

Calculated Parameters

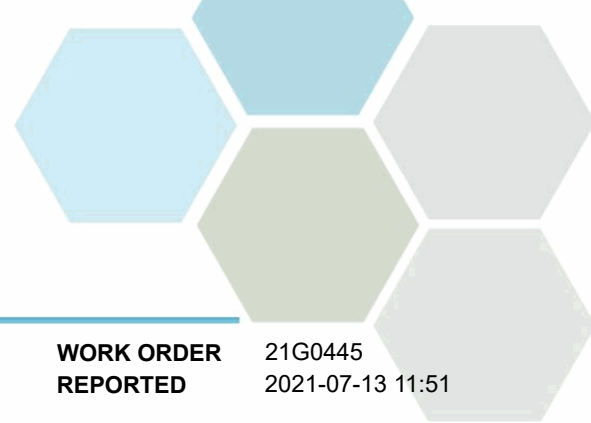
Hardness, Total (as CaCO3)	120	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.356	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.332	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.024	None Required	0.020 mg/L	2021-07-07	
Chlorophyll a	1.54	N/A	0.10 µg/L	2021-07-09	
Nitrogen, Total Kjeldahl	0.356	N/A	0.050 mg/L	2021-07-12	
Phosphorus, Total (as P)	0.0147	N/A	0.0050 mg/L	2021-07-12	
Phosphorus, Total Dissolved	0.0147	N/A	0.0050 mg/L	2021-07-12	

Total Metals

Aluminum, total	0.0159	OG < 0.1	0.0050 mg/L	2021-07-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-07-11	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050 mg/L	2021-07-11	
Barium, total	0.0238	MAC = 2	0.0050 mg/L	2021-07-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-07-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-07-11	
Calcium, total	32.3	None Required	0.20 mg/L	2021-07-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-07-11	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Copper, total	0.00253	MAC = 2	0.00040 mg/L	2021-07-11	
Iron, total	0.038	AO ≤ 0.3	0.010 mg/L	2021-07-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-07-11	
Lithium, total	0.00327	N/A	0.00010 mg/L	2021-07-11	
Magnesium, total	9.46	None Required	0.010 mg/L	2021-07-11	
Manganese, total	0.00580	MAC = 0.12	0.00020 mg/L	2021-07-11	
Molybdenum, total	0.00389	N/A	0.00010 mg/L	2021-07-11	
Nickel, total	0.00062	N/A	0.00040 mg/L	2021-07-11	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-07-11	
Potassium, total	2.39	N/A	0.10 mg/L	2021-07-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-07-11	
Silicon, total	2.9	N/A	1.0 mg/L	2021-07-11	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-07-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10 m composite (21G0445-01) Matrix: Water Sampled: 2021-07-06 09:30, Continued					
<i>Total Metals, Continued</i>					
Sodium, total	12.3	AO ≤ 200	0.10 mg/L	2021-07-11	
Strontium, total	0.280	7	0.0010 mg/L	2021-07-11	
Sulfur, total	10.6	N/A	3.0 mg/L	2021-07-11	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-07-11	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-07-11	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Tin, total	0.00020	N/A	0.00020 mg/L	2021-07-11	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-07-11	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-07-11	
Uranium, total	0.00234	MAC = 0.02	0.000020 mg/L	2021-07-11	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-07-11	
Zinc, total	0.0069	AO ≤ 5	0.0040 mg/L	2021-07-11	
Zirconium, total	0.00011	N/A	0.00010 mg/L	2021-07-11	

Vaseux 20, 22, 24 m composite (21G0445-02) | Matrix: Water | Sampled: 2021-07-06 10:00

Anions

Chloride	5.67	AO ≤ 250	0.10 mg/L	2021-07-07	
Nitrate (as N)	0.055	MAC = 10	0.010 mg/L	2021-07-07	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-07-07	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-07-07	
Sulfate	27.0	AO ≤ 500	1.0 mg/L	2021-07-07	

Calculated Parameters

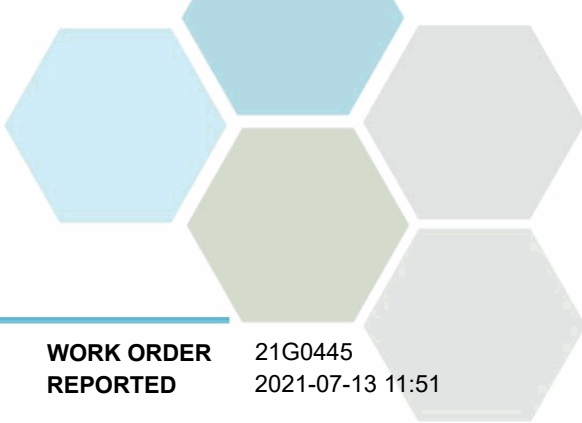
Hardness, Total (as CaCO ₃)	128	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	0.0554	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	1.03	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.902	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.073	None Required	0.020 mg/L	2021-07-07	
Chlorophyll a	0.64	N/A	0.10 µg/L	2021-07-09	
Nitrogen, Total Kjeldahl	0.975	N/A	0.050 mg/L	2021-07-12	
Phosphorus, Total (as P)	0.0495	N/A	0.0050 mg/L	2021-07-12	
Phosphorus, Total Dissolved	0.0246	N/A	0.0050 mg/L	2021-07-12	

Total Metals

Aluminum, total	0.0172	OG < 0.1	0.0050 mg/L	2021-07-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-07-11	
Arsenic, total	0.00060	MAC = 0.01	0.00050 mg/L	2021-07-11	
Barium, total	0.0263	MAC = 2	0.0050 mg/L	2021-07-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-07-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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Vaseux 20, 22, 24 m composite (21G0445-02) | Matrix: Water | Sampled: 2021-07-06 10:00, Continued

Total Metals, Continued

Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-07-11	
Calcium, total	35.0	None Required	0.20	mg/L	2021-07-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-07-11	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	
Copper, total	0.00063	MAC = 2	0.00040	mg/L	2021-07-11	
Iron, total	0.261	AO ≤ 0.3	0.010	mg/L	2021-07-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-07-11	
Lithium, total	0.00327	N/A	0.00010	mg/L	2021-07-11	
Magnesium, total	9.75	None Required	0.010	mg/L	2021-07-11	
Manganese, total	0.248	MAC = 0.12	0.00020	mg/L	2021-07-11	
Molybdenum, total	0.00341	N/A	0.00010	mg/L	2021-07-11	
Nickel, total	0.00052	N/A	0.00040	mg/L	2021-07-11	
Phosphorus, total	0.097	N/A	0.050	mg/L	2021-07-11	
Potassium, total	2.54	N/A	0.10	mg/L	2021-07-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-07-11	
Silicon, total	4.3	N/A	1.0	mg/L	2021-07-11	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-07-11	
Sodium, total	12.5	AO ≤ 200	0.10	mg/L	2021-07-11	
Strontium, total	0.295	7	0.0010	mg/L	2021-07-11	
Sulfur, total	6.6	N/A	3.0	mg/L	2021-07-11	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-07-11	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-07-11	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-07-11	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-07-11	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-07-11	
Uranium, total	0.00216	MAC = 0.02	0.000020	mg/L	2021-07-11	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-07-11	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2021-07-11	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	

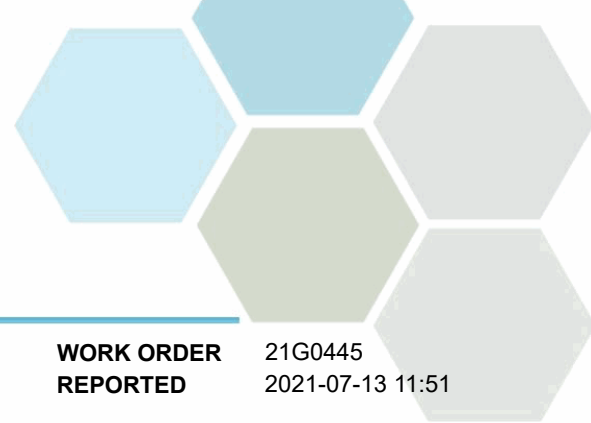
Vaseux 1, 5, 10 m composite - Triplicate 1 (21G0445-03) | Matrix: Water | Sampled: 2021-07-06 09:35

Anions

Chloride	5.42	AO ≤ 250	0.10	mg/L	2021-07-07	
Nitrate (as N)	< 0.010	MAC = 10	0.010	mg/L	2021-07-07	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2021-07-07	
Phosphate (as P)	< 0.0050	N/A	0.0050	mg/L	2021-07-07	
Sulfate	28.2	AO ≤ 500	1.0	mg/L	2021-07-07	

Calculated Parameters

Hardness, Total (as CaCO3)	116	None Required	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100	mg/L	N/A	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite - Triplicate 1 (21G0445-03) | Matrix: Water | Sampled: 2021-07-06 09:35,
Continued

Calculated Parameters, Continued

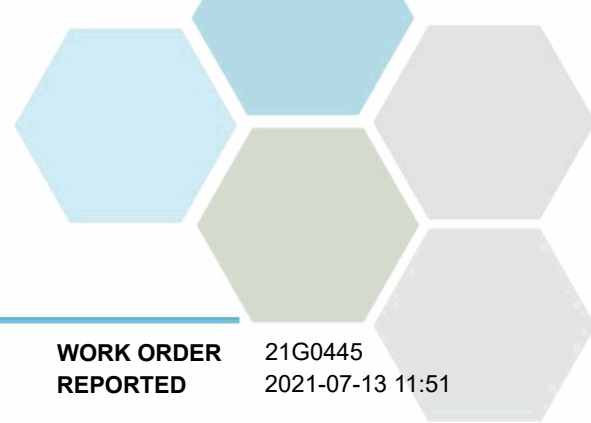
Nitrogen, Total	0.974	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.945	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.029	None Required	0.020 mg/L	2021-07-07	
Nitrogen, Total Kjeldahl	0.974	N/A	0.050 mg/L	2021-07-12	
Phosphorus, Total (as P)	0.0127	N/A	0.0050 mg/L	2021-07-12	
Phosphorus, Total Dissolved	0.0127	N/A	0.0050 mg/L	2021-07-12	

Total Metals

Aluminum, total	0.0148	OG < 0.1	0.0050 mg/L	2021-07-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-07-11	
Arsenic, total	0.00052	MAC = 0.01	0.00050 mg/L	2021-07-11	
Barium, total	0.0229	MAC = 2	0.0050 mg/L	2021-07-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-07-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-07-11	
Calcium, total	31.4	None Required	0.20 mg/L	2021-07-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-07-11	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Copper, total	0.00078	MAC = 2	0.00040 mg/L	2021-07-11	
Iron, total	0.021	AO ≤ 0.3	0.010 mg/L	2021-07-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-07-11	
Lithium, total	0.00317	N/A	0.00010 mg/L	2021-07-11	
Magnesium, total	9.14	None Required	0.010 mg/L	2021-07-11	
Manganese, total	0.00559	MAC = 0.12	0.00020 mg/L	2021-07-11	
Molybdenum, total	0.00354	N/A	0.00010 mg/L	2021-07-11	
Nickel, total	0.00047	N/A	0.00040 mg/L	2021-07-11	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-07-11	
Potassium, total	2.28	N/A	0.10 mg/L	2021-07-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-07-11	
Silicon, total	2.7	N/A	1.0 mg/L	2021-07-11	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-07-11	
Sodium, total	11.8	AO ≤ 200	0.10 mg/L	2021-07-11	
Strontium, total	0.266	7	0.0010 mg/L	2021-07-11	
Sulfur, total	9.1	N/A	3.0 mg/L	2021-07-11	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-07-11	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-07-11	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-07-11	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-07-11	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-07-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite - Triplicate 1 (21G0445-03) | Matrix: Water | Sampled: 2021-07-06 09:35, Continued

Total Metals, Continued

Uranium, total	0.00232	MAC = 0.02	0.000020 mg/L	2021-07-11	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-07-11	
Zinc, total	0.0040	AO ≤ 5	0.0040 mg/L	2021-07-11	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	

Vaseux 1, 5, 10 m composite - Triplicate 2 (21G0445-04) | Matrix: Water | Sampled: 2021-07-06 09:40

Anions

Chloride	5.43	AO ≤ 250	0.10 mg/L	2021-07-07	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-07-07	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-07-07	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-07-07	
Sulfate	28.2	AO ≤ 500	1.0 mg/L	2021-07-07	

Calculated Parameters

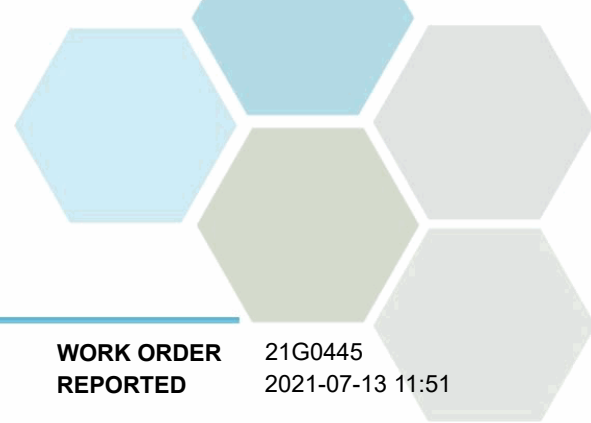
Hardness, Total (as CaCO ₃)	122	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.273	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.245	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.028	None Required	0.020 mg/L	2021-07-07	
Nitrogen, Total Kjeldahl	0.273	N/A	0.050 mg/L	2021-07-12	
Phosphorus, Total (as P)	0.0123	N/A	0.0050 mg/L	2021-07-12	
Phosphorus, Total Dissolved	0.0123	N/A	0.0050 mg/L	2021-07-12	

Total Metals

Aluminum, total	0.0177	OG < 0.1	0.0050 mg/L	2021-07-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-07-11	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050 mg/L	2021-07-11	
Barium, total	0.0241	MAC = 2	0.0050 mg/L	2021-07-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-07-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-07-11	
Calcium, total	33.2	None Required	0.20 mg/L	2021-07-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-07-11	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Copper, total	0.00094	MAC = 2	0.00040 mg/L	2021-07-11	
Iron, total	0.031	AO ≤ 0.3	0.010 mg/L	2021-07-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-07-11	
Lithium, total	0.00331	N/A	0.00010 mg/L	2021-07-11	
Magnesium, total	9.51	None Required	0.010 mg/L	2021-07-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite - Triplicate 2 (21G0445-04) | Matrix: Water | Sampled: 2021-07-06 09:40, Continued

Total Metals, Continued

Manganese, total	0.00613	MAC = 0.12	0.00020 mg/L	2021-07-11	
Molybdenum, total	0.00387	N/A	0.00010 mg/L	2021-07-11	
Nickel, total	0.00059	N/A	0.00040 mg/L	2021-07-11	
Phosphorus, total	0.061	N/A	0.050 mg/L	2021-07-11	
Potassium, total	2.41	N/A	0.10 mg/L	2021-07-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-07-11	
Silicon, total	2.9	N/A	1.0 mg/L	2021-07-11	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-07-11	
Sodium, total	12.3	AO ≤ 200	0.10 mg/L	2021-07-11	
Strontium, total	0.280	7	0.0010 mg/L	2021-07-11	
Sulfur, total	6.8	N/A	3.0 mg/L	2021-07-11	
Tellurium, total	0.00052	N/A	0.00050 mg/L	2021-07-11	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-07-11	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-07-11	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-07-11	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-07-11	
Uranium, total	0.00235	MAC = 0.02	0.000020 mg/L	2021-07-11	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-07-11	
Zinc, total	0.0045	AO ≤ 5	0.0040 mg/L	2021-07-11	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	

Vaseux 20, 22, 24 m composite - Triplicate 1 (21G0445-05) | Matrix: Water | Sampled: 2021-07-06 10:05

Anions

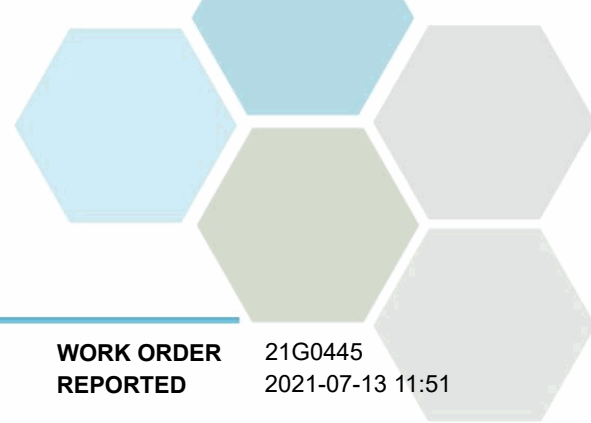
Chloride	5.65	AO ≤ 250	0.10 mg/L	2021-07-07	
Nitrate (as N)	0.056	MAC = 10	0.010 mg/L	2021-07-07	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-07-07	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-07-07	
Sulfate	27.1	AO ≤ 500	1.0 mg/L	2021-07-07	

Calculated Parameters

Hardness, Total (as CaCO ₃)	133	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	0.0565	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.488	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.359	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.073	None Required	0.020 mg/L	2021-07-07	
Nitrogen, Total Kjeldahl	0.432	N/A	0.050 mg/L	2021-07-12	
Phosphorus, Total (as P)	0.0417	N/A	0.0050 mg/L	2021-07-12	
Phosphorus, Total Dissolved	0.0243	N/A	0.0050 mg/L	2021-07-12	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

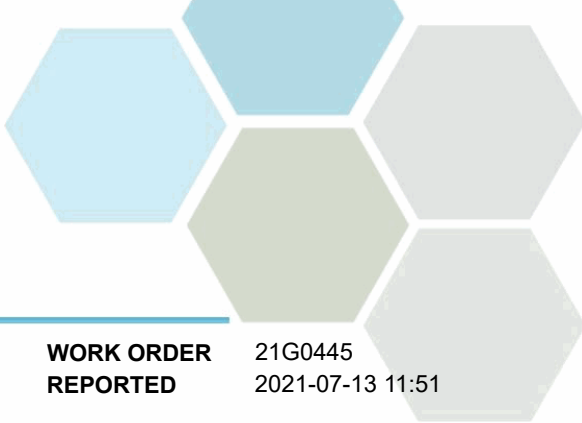
WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Vaseux 20, 22, 24 m composite - Triplicate 1 (21G0445-05) Matrix: Water Sampled: 2021-07-06 10:05, Continued						
Total Metals						
Aluminum, total	0.0154	OG < 0.1	0.0050	mg/L	2021-07-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2021-07-11	
Arsenic, total	0.00066	MAC = 0.01	0.00050	mg/L	2021-07-11	
Barium, total	0.0278	MAC = 2	0.0050	mg/L	2021-07-11	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2021-07-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-07-11	
Calcium, total	36.6	None Required	0.20	mg/L	2021-07-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-07-11	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	
Copper, total	0.00079	MAC = 2	0.00040	mg/L	2021-07-11	
Iron, total	0.272	AO ≤ 0.3	0.010	mg/L	2021-07-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-07-11	
Lithium, total	0.00351	N/A	0.00010	mg/L	2021-07-11	
Magnesium, total	10.0	None Required	0.010	mg/L	2021-07-11	
Manganese, total	0.257	MAC = 0.12	0.00020	mg/L	2021-07-11	
Molybdenum, total	0.00377	N/A	0.00010	mg/L	2021-07-11	
Nickel, total	0.00059	N/A	0.00040	mg/L	2021-07-11	
Phosphorus, total	0.060	N/A	0.050	mg/L	2021-07-11	
Potassium, total	2.65	N/A	0.10	mg/L	2021-07-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-07-11	
Silicon, total	4.6	N/A	1.0	mg/L	2021-07-11	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-07-11	
Sodium, total	12.9	AO ≤ 200	0.10	mg/L	2021-07-11	
Strontium, total	0.307	7	0.0010	mg/L	2021-07-11	
Sulfur, total	7.9	N/A	3.0	mg/L	2021-07-11	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-07-11	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-07-11	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-07-11	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-07-11	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-07-11	
Uranium, total	0.00223	MAC = 0.02	0.000020	mg/L	2021-07-11	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-07-11	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2021-07-11	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	

Vaseux 20, 22, 24 m composite - Triplicate 2 (21G0445-06) | Matrix: Water | Sampled: 2021-07-06 10:10

Anions

Chloride	5.66	AO ≤ 250	0.10	mg/L	2021-07-07	
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TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 20, 22, 24 m composite - Triplicate 2 (21G0445-06) | Matrix: Water | Sampled: 2021-07-06 10:10, Continued

Anions, Continued

Nitrate (as N)	0.056	MAC = 10	0.010 mg/L	2021-07-07	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-07-07	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-07-07	
Sulfate	27.1	AO ≤ 500	1.0 mg/L	2021-07-07	

Calculated Parameters

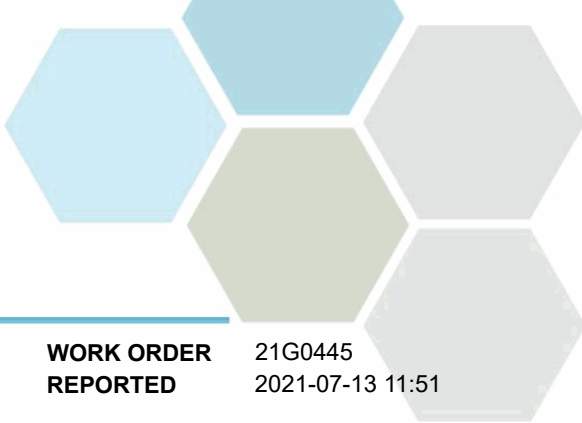
Hardness, Total (as CaCO3)	124	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	0.0560	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.360	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.226	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.078	None Required	0.020 mg/L	2021-07-07	
Nitrogen, Total Kjeldahl	0.304	N/A	0.050 mg/L	2021-07-12	
Phosphorus, Total (as P)	0.0432	N/A	0.0050 mg/L	2021-07-12	
Phosphorus, Total Dissolved	0.0251	N/A	0.0050 mg/L	2021-07-12	

Total Metals

Aluminum, total	0.0169	OG < 0.1	0.0050 mg/L	2021-07-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-07-11	
Arsenic, total	0.00063	MAC = 0.01	0.00050 mg/L	2021-07-11	
Barium, total	0.0273	MAC = 2	0.0050 mg/L	2021-07-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-07-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-07-11	
Calcium, total	34.1	None Required	0.20 mg/L	2021-07-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-07-11	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-07-11	
Copper, total	0.00057	MAC = 2	0.00040 mg/L	2021-07-11	
Iron, total	0.258	AO ≤ 0.3	0.010 mg/L	2021-07-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-07-11	
Lithium, total	0.00328	N/A	0.00010 mg/L	2021-07-11	
Magnesium, total	9.54	None Required	0.010 mg/L	2021-07-11	
Manganese, total	0.246	MAC = 0.12	0.00020 mg/L	2021-07-11	
Molybdenum, total	0.00334	N/A	0.00010 mg/L	2021-07-11	
Nickel, total	0.00052	N/A	0.00040 mg/L	2021-07-11	
Phosphorus, total	0.062	N/A	0.050 mg/L	2021-07-11	
Potassium, total	2.52	N/A	0.10 mg/L	2021-07-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-07-11	
Silicon, total	4.4	N/A	1.0 mg/L	2021-07-11	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-07-11	
Sodium, total	12.3	AO ≤ 200	0.10 mg/L	2021-07-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

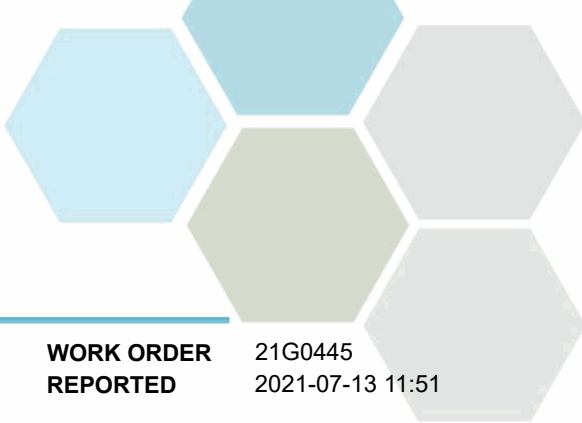
WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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Vaseux 20, 22, 24 m composite - Triplicate 2 (21G0445-06) | Matrix: Water | Sampled: 2021-07-06 10:10, Continued

Total Metals, Continued

Strontium, total	0.295	7	0.0010	mg/L	2021-07-11	
Sulfur, total	7.1	N/A	3.0	mg/L	2021-07-11	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-07-11	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-07-11	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-07-11	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-07-11	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-07-11	
Uranium, total	0.00204	MAC = 0.02	0.000020	mg/L	2021-07-11	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-07-11	
Zinc, total	0.0041	AO ≤ 5	0.0040	mg/L	2021-07-11	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-07-11	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

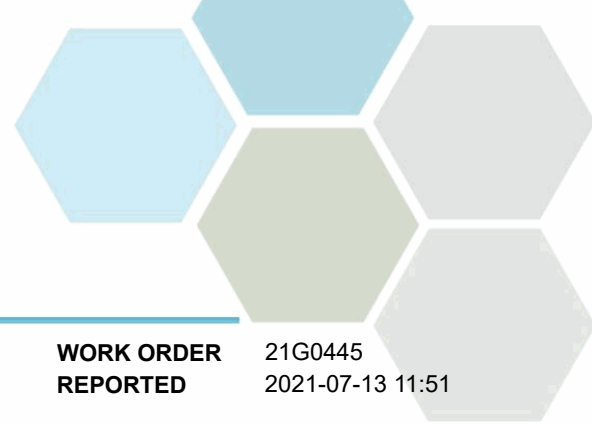
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO Regional District of Okanagan Similkameen
PROJECT OK Falls (Vaseux Lake) via LAC

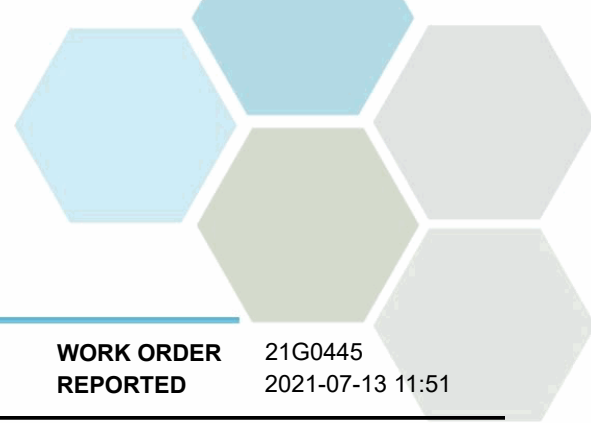
WORK ORDER 21G0445
REPORTED 2021-07-13 11:51

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

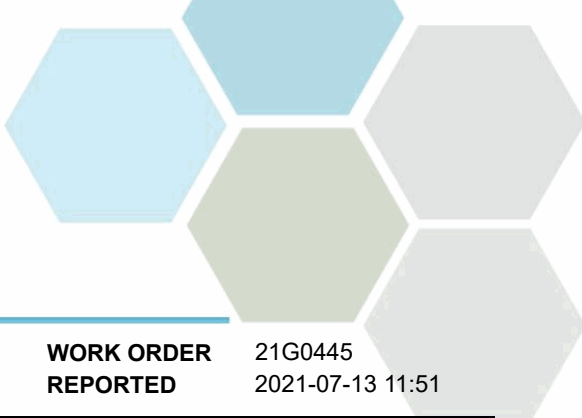
WORK ORDER REPORTED 21G0445
2021-07-13 11:51

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 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
Anions, Batch B1G0562									
Blank (B1G0562-BLK1)			Prepared: 2021-07-07, Analyzed: 2021-07-07						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
Blank (B1G0562-BLK2)			Prepared: 2021-07-08, Analyzed: 2021-07-08						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
LCS (B1G0562-BS1)			Prepared: 2021-07-07, Analyzed: 2021-07-07						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	4.18	0.010 mg/L	4.00		104	90-110			
Nitrite (as N)	1.99	0.010 mg/L	2.00		100	85-115			
Phosphate (as P)	0.980	0.0050 mg/L	1.00		98	80-120			
Sulfate	16.5	1.0 mg/L	16.0		103	90-110			
LCS (B1G0562-BS2)			Prepared: 2021-07-08, Analyzed: 2021-07-08						
Chloride	16.1	0.10 mg/L	16.0		101	90-110			
Nitrate (as N)	4.08	0.010 mg/L	4.00		102	90-110			
Nitrite (as N)	1.96	0.010 mg/L	2.00		98	85-115			
Phosphate (as P)	0.946	0.0050 mg/L	1.00		95	80-120			
Sulfate	16.2	1.0 mg/L	16.0		102	90-110			
Duplicate (B1G0562-DUP1)			Source: 21G0445-01		Prepared: 2021-07-07, Analyzed: 2021-07-07				
Chloride	5.43	0.10 mg/L		5.43			< 1	10	
Nitrate (as N)	< 0.010	0.010 mg/L		< 0.010				10	
Nitrite (as N)	< 0.010	0.010 mg/L		< 0.010				15	
Phosphate (as P)	< 0.0050	0.0050 mg/L		< 0.0050				20	
Sulfate	28.8	1.0 mg/L		28.8			< 1	10	
Matrix Spike (B1G0562-MS1)			Source: 21G0445-01		Prepared: 2021-07-07, Analyzed: 2021-07-07				
Chloride	20.3	0.10 mg/L	16.0	5.43	93	75-125			
Nitrate (as N)	3.87	0.010 mg/L	4.00	< 0.010	97	75-125			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls (Vaseux Lake) via LAC	WORK ORDER REPORTED	21G0445 2021-07-13 11:51
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B1G0562, Continued									
Matrix Spike (B1G0562-MS1), Continued		Source: 21G0445-01		Prepared: 2021-07-07, Analyzed: 2021-07-07					
Nitrite (as N)	2.11	0.010 mg/L	2.00	< 0.010	106	80-120			
Phosphate (as P)	0.895	0.0050 mg/L	1.00	< 0.0050	89	70-130			
Sulfate	44.5	1.0 mg/L	16.0	28.8	98	75-125			

General Parameters, Batch B1G0422

Blank (B1G0422-BLK1)		Prepared: 2021-07-05, Analyzed: 2021-07-09							
Chlorophyll a	< 0.10	0.10 µg/L							

General Parameters, Batch B1G0585

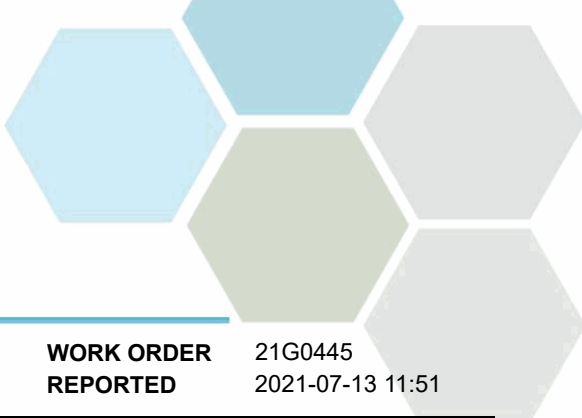
Blank (B1G0585-BLK1)		Prepared: 2021-07-07, Analyzed: 2021-07-07							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1G0585-BLK2)		Prepared: 2021-07-07, Analyzed: 2021-07-07							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1G0585-BLK3)		Prepared: 2021-07-07, Analyzed: 2021-07-07							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
LCS (B1G0585-BS1)		Prepared: 2021-07-07, Analyzed: 2021-07-07							
Ammonia, Total (as N)	0.963	0.020 mg/L	1.00		96	90-115			
LCS (B1G0585-BS2)		Prepared: 2021-07-07, Analyzed: 2021-07-07							
Ammonia, Total (as N)	0.976	0.020 mg/L	1.00		98	90-115			
LCS (B1G0585-BS3)		Prepared: 2021-07-07, Analyzed: 2021-07-07							
Ammonia, Total (as N)	1.07	0.020 mg/L	1.00		107	90-115			

General Parameters, Batch B1G0939

Blank (B1G0939-BLK1)		Prepared: 2021-07-09, Analyzed: 2021-07-12							
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B1G0939-BLK2)		Prepared: 2021-07-09, Analyzed: 2021-07-12							
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1G0939-BS1)		Prepared: 2021-07-09, Analyzed: 2021-07-12							
Nitrogen, Total Kjeldahl	1.06	0.050 mg/L	1.00		106	85-115			
LCS (B1G0939-BS2)		Prepared: 2021-07-09, Analyzed: 2021-07-12							
Nitrogen, Total Kjeldahl	1.08	0.050 mg/L	1.00		108	85-115			
Duplicate (B1G0939-DUP1)		Source: 21G0445-01		Prepared: 2021-07-09, Analyzed: 2021-07-12					
Nitrogen, Total Kjeldahl	0.359	0.050 mg/L		0.356			< 1	15	
Matrix Spike (B1G0939-MS1)		Source: 21G0445-01		Prepared: 2021-07-09, Analyzed: 2021-07-12					
Nitrogen, Total Kjeldahl	2.62	0.100 mg/L	2.00	0.356	113	65-135			

General Parameters, Batch B1G1059

Blank (B1G1059-BLK1)		Prepared: 2021-07-12, Analyzed: 2021-07-12							
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							



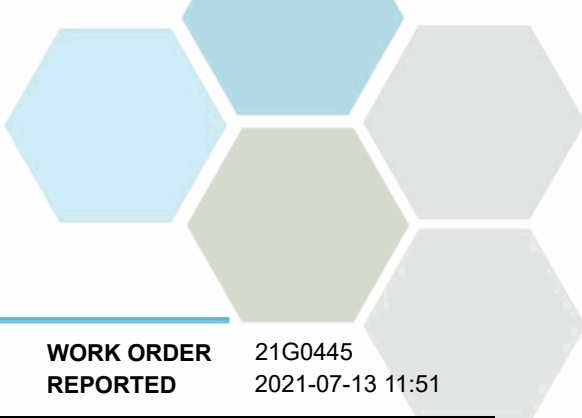
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls (Vaseux Lake) via LAC	WORK ORDER REPORTED	21G0445 2021-07-13 11:51
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1G1059, Continued									
Blank (B1G1059-BLK2)			Prepared: 2021-07-12, Analyzed: 2021-07-12						
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
LCS (B1G1059-BS1)			Prepared: 2021-07-12, Analyzed: 2021-07-12						
Phosphorus, Total (as P)	0.108	0.0050 mg/L	0.100		108	85-115			
Phosphorus, Total Dissolved	0.107	0.0050 mg/L	0.100		107	85-115			
LCS (B1G1059-BS2)			Prepared: 2021-07-12, Analyzed: 2021-07-12						
Phosphorus, Total (as P)	0.110	0.0050 mg/L	0.100		110	85-115			
Duplicate (B1G1059-DUP1)			Source: 21G0445-02		Prepared: 2021-07-12, Analyzed: 2021-07-12				
Phosphorus, Total (as P)	0.0430	0.0050 mg/L		0.0495			14	15	
Phosphorus, Total Dissolved	0.0244	0.0050 mg/L		0.0246				15	
Matrix Spike (B1G1059-MS1)			Source: 21G0445-02		Prepared: 2021-07-12, Analyzed: 2021-07-12				
Phosphorus, Total (as P)	0.147	0.0050 mg/L	0.102	0.0495	96	70-125			
Phosphorus, Total Dissolved	0.131	0.0050 mg/L	0.102	0.0246	104	70-125			

Total Metals, Batch B1G0932

Blank (B1G0932-BLK1)			Prepared: 2021-07-09, Analyzed: 2021-07-10						
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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							

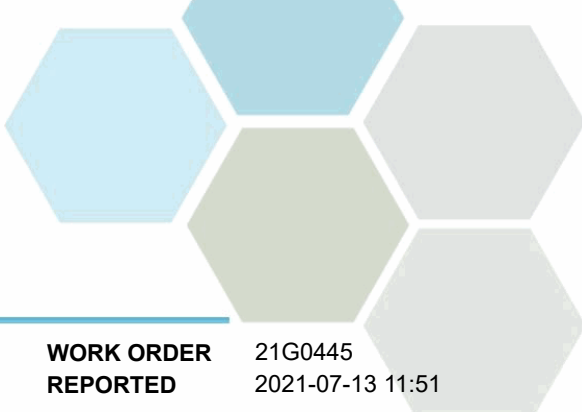


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1G0932, Continued									
Blank (B1G0932-BLK1), Continued					Prepared: 2021-07-09, Analyzed: 2021-07-10				
Zirconium, total	< 0.00010	0.00010 mg/L							
LCS (B1G0932-BS1)					Prepared: 2021-07-09, Analyzed: 2021-07-10				
Aluminum, total	0.0232	0.0050 mg/L	0.0199		117	80-120			
Antimony, total	0.0219	0.00020 mg/L	0.0200		110	80-120			
Arsenic, total	0.0216	0.00050 mg/L	0.0200		108	80-120			
Barium, total	0.0218	0.0050 mg/L	0.0198		110	80-120			
Beryllium, total	0.0192	0.00010 mg/L	0.0198		97	80-120			
Bismuth, total	0.0193	0.00010 mg/L	0.0200		96	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		96	80-120			
Cadmium, total	0.0217	0.000010 mg/L	0.0199		109	80-120			
Calcium, total	2.10	0.20 mg/L	2.02		104	80-120			
Chromium, total	0.0219	0.00050 mg/L	0.0198		111	80-120			
Cobalt, total	0.0218	0.00010 mg/L	0.0199		110	80-120			
Copper, total	0.0204	0.00040 mg/L	0.0200		102	80-120			
Iron, total	2.03	0.010 mg/L	2.02		101	80-120			
Lead, total	0.0192	0.00020 mg/L	0.0199		96	80-120			
Lithium, total	0.0193	0.00010 mg/L	0.0200		96	80-120			
Magnesium, total	2.10	0.010 mg/L	2.02		104	80-120			
Manganese, total	0.0210	0.00020 mg/L	0.0199		105	80-120			
Molybdenum, total	0.0233	0.00010 mg/L	0.0200		116	80-120			
Nickel, total	0.0227	0.00040 mg/L	0.0200		113	80-120			
Phosphorus, total	2.01	0.050 mg/L	2.00		101	80-120			
Potassium, total	2.00	0.10 mg/L	2.02		99	80-120			
Selenium, total	0.0196	0.00050 mg/L	0.0200		98	80-120			
Silicon, total	2.2	1.0 mg/L	2.00		110	80-120			
Silver, total	0.0208	0.000050 mg/L	0.0200		104	80-120			
Sodium, total	2.03	0.10 mg/L	2.02		100	80-120			
Strontium, total	0.0194	0.0010 mg/L	0.0200		97	80-120			
Sulfur, total	4.7	3.0 mg/L	5.00		94	80-120			
Tellurium, total	0.0226	0.00050 mg/L	0.0200		113	80-120			
Thallium, total	0.0194	0.000020 mg/L	0.0199		98	80-120			
Thorium, total	0.0187	0.00010 mg/L	0.0200		93	80-120			
Tin, total	0.0218	0.00020 mg/L	0.0200		109	80-120			
Titanium, total	0.0236	0.0050 mg/L	0.0200		118	80-120			
Tungsten, total	0.0233	0.0010 mg/L	0.0200		116	80-120			
Uranium, total	0.0188	0.000020 mg/L	0.0200		94	80-120			
Vanadium, total	0.0217	0.0010 mg/L	0.0200		108	80-120			
Zinc, total	0.0233	0.0040 mg/L	0.0200		117	80-120			
Zirconium, total	0.0226	0.00010 mg/L	0.0200		113	80-120			
Reference (B1G0932-SRM1)					Prepared: 2021-07-09, Analyzed: 2021-07-10				
Aluminum, total	0.322	0.0050 mg/L	0.299		108	70-130			
Antimony, total	0.0553	0.00020 mg/L	0.0517		107	70-130			
Arsenic, total	0.135	0.00050 mg/L	0.119		113	70-130			
Barium, total	0.837	0.0050 mg/L	0.801		105	70-130			
Beryllium, total	0.0508	0.00010 mg/L	0.0501		101	70-130			
Boron, total	3.72	0.0500 mg/L	4.11		90	70-130			
Cadmium, total	0.0545	0.000010 mg/L	0.0503		108	70-130			
Calcium, total	11.1	0.20 mg/L	10.7		103	70-130			
Chromium, total	0.278	0.00050 mg/L	0.250		111	70-130			
Cobalt, total	0.0432	0.00010 mg/L	0.0384		113	70-130			
Copper, total	0.504	0.00040 mg/L	0.487		103	70-130			
Iron, total	0.535	0.010 mg/L	0.504		106	70-130			
Lead, total	0.284	0.00020 mg/L	0.278		102	70-130			
Lithium, total	0.410	0.00010 mg/L	0.398		103	70-130			
Magnesium, total	3.90	0.010 mg/L	3.59		109	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21G0445
2021-07-13 11:51

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1G0932, Continued									
Reference (B1G0932-SRM1), Continued					Prepared: 2021-07-09, Analyzed: 2021-07-10				
Manganese, total	0.117	0.00020 mg/L	0.111		105	70-130			
Molybdenum, total	0.233	0.00010 mg/L	0.196		119	70-130			
Nickel, total	0.278	0.00040 mg/L	0.248		112	70-130			
Phosphorus, total	0.261	0.050 mg/L	0.213		123	70-130			
Potassium, total	6.19	0.10 mg/L	5.89		105	70-130			
Selenium, total	0.129	0.00050 mg/L	0.120		107	70-130			
Sodium, total	9.13	0.10 mg/L	8.71		105	70-130			
Strontium, total	0.381	0.0010 mg/L	0.393		97	70-130			
Thallium, total	0.0823	0.000020 mg/L	0.0787		105	70-130			
Uranium, total	0.0341	0.000020 mg/L	0.0344		99	70-130			
Vanadium, total	0.424	0.0010 mg/L	0.391		108	70-130			
Zinc, total	2.65	0.0040 mg/L	2.50		106	70-130			



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21H0575
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-08-05 14:55 / 16.6°C
PO NUMBER	OK Falls (Vaseux Lake) via LAC	REPORTED	2021-08-12 14:10
PROJECT	OK Falls (Vaseux Lake) via LAC	COC NUMBER	44174.36895
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

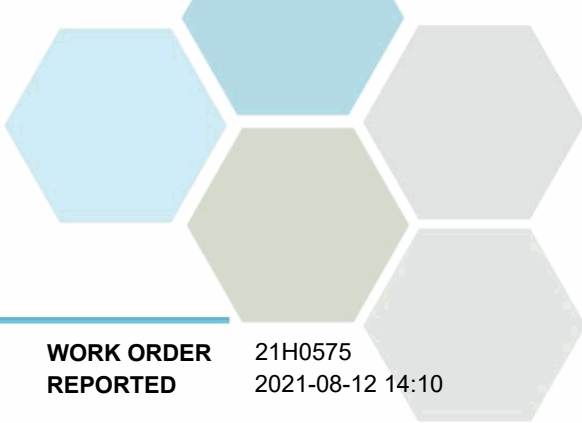
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21H0575
2021-08-12 14:10

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite (21H0575-01) | Matrix: Water | Sampled: 2021-08-05

Anions

Chloride	5.86	AO ≤ 250	0.10 mg/L	2021-08-06	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-08-06	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-08-06	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-08-06	
Sulfate	28.1	AO ≤ 500	1.0 mg/L	2021-08-06	

Calculated Parameters

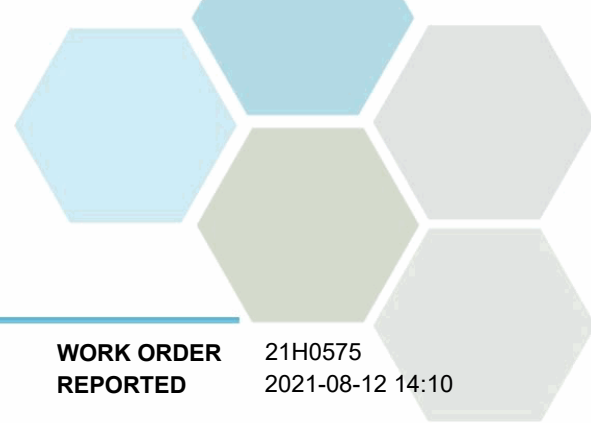
Hardness, Total (as CaCO3)	118	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.341	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.318	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.023	None Required	0.020 mg/L	2021-08-06	
Chlorophyll a	< 1.40	N/A	0.10 µg/L	2021-08-12	
Nitrogen, Total Kjeldahl	0.341	N/A	0.050 mg/L	2021-08-10	
Phosphorus, Total (as P)	0.0144	N/A	0.0050 mg/L	2021-08-10	
Phosphorus, Total Dissolved	0.0145	N/A	0.0050 mg/L	2021-08-10	

Total Metals

Aluminum, total	0.0150	OG < 0.1	0.0050 mg/L	2021-08-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-08-11	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050 mg/L	2021-08-11	
Barium, total	0.0231	MAC = 2	0.0050 mg/L	2021-08-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-08-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-08-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-08-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-08-11	
Calcium, total	31.8	None Required	0.20 mg/L	2021-08-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-08-11	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-08-11	
Copper, total	0.00065	MAC = 2	0.00040 mg/L	2021-08-11	
Iron, total	0.020	AO ≤ 0.3	0.010 mg/L	2021-08-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-08-11	
Lithium, total	0.00359	N/A	0.00010 mg/L	2021-08-11	
Magnesium, total	9.41	None Required	0.010 mg/L	2021-08-11	
Manganese, total	0.0127	MAC = 0.12	0.00020 mg/L	2021-08-11	
Molybdenum, total	0.00323	N/A	0.00010 mg/L	2021-08-11	
Nickel, total	< 0.00040	N/A	0.00040 mg/L	2021-08-11	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-08-11	
Potassium, total	2.64	N/A	0.10 mg/L	2021-08-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-08-11	
Silicon, total	3.4	N/A	1.0 mg/L	2021-08-11	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-08-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21H0575
2021-08-12 14:10

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10 m composite (21H0575-01) Matrix: Water Sampled: 2021-08-05, Continued					
<i>Total Metals, Continued</i>					
Sodium, total	12.9	AO ≤ 200	0.10 mg/L	2021-08-11	
Strontium, total	0.302	7	0.0010 mg/L	2021-08-11	
Sulfur, total	10.2	N/A	3.0 mg/L	2021-08-11	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-08-11	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-08-11	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-08-11	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-08-11	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-08-11	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-08-11	
Uranium, total	0.00229	MAC = 0.02	0.000020 mg/L	2021-08-11	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-08-11	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-08-11	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-08-11	

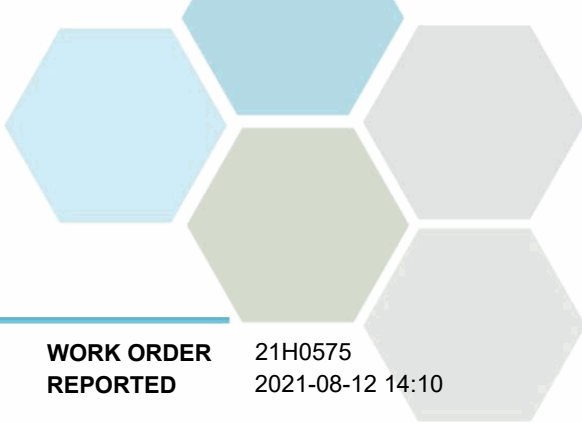
Vaseux 20, 22, 24 m composite (21H0575-02) | Matrix: Water | Sampled: 2021-08-05

<i>Anions</i>					
Chloride	5.80	AO ≤ 250	0.10 mg/L	2021-08-06	
Nitrate (as N)	0.094	MAC = 10	0.010 mg/L	2021-08-06	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-08-06	
Phosphate (as P)	0.0170	N/A	0.0050 mg/L	2021-08-06	
Sulfate	25.4	AO ≤ 500	1.0 mg/L	2021-08-06	

<i>Calculated Parameters</i>					
Hardness, Total (as CaCO3)	121	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	0.0944	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.487	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.305	N/A	0.0500 mg/L	N/A	

<i>General Parameters</i>					
Ammonia, Total (as N)	0.088	None Required	0.020 mg/L	2021-08-06	
Chlorophyll a	< 1.00	N/A	0.10 µg/L	2021-08-12	
Nitrogen, Total Kjeldahl	0.393	N/A	0.050 mg/L	2021-08-10	
Phosphorus, Total (as P)	0.0656	N/A	0.0050 mg/L	2021-08-10	
Phosphorus, Total Dissolved	0.0396	N/A	0.0050 mg/L	2021-08-10	

<i>Total Metals</i>					
Aluminum, total	0.0493	OG < 0.1	0.0050 mg/L	2021-08-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-08-11	
Arsenic, total	0.00061	MAC = 0.01	0.00050 mg/L	2021-08-11	
Barium, total	0.0241	MAC = 2	0.0050 mg/L	2021-08-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-08-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-08-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-08-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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Vaseux 20, 22, 24 m composite (21H0575-02) | Matrix: Water | Sampled: 2021-08-05, Continued

Total Metals, Continued

Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-08-11	
Calcium, total	33.3	None Required	0.20	mg/L	2021-08-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-08-11	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	
Copper, total	0.00040	MAC = 2	0.00040	mg/L	2021-08-11	
Iron, total	0.284	AO ≤ 0.3	0.010	mg/L	2021-08-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-08-11	
Lithium, total	0.00366	N/A	0.00010	mg/L	2021-08-11	
Magnesium, total	9.15	None Required	0.010	mg/L	2021-08-11	
Manganese, total	0.355	MAC = 0.12	0.00020	mg/L	2021-08-11	
Molybdenum, total	0.00288	N/A	0.00010	mg/L	2021-08-11	
Nickel, total	0.00049	N/A	0.00040	mg/L	2021-08-11	
Phosphorus, total	0.072	N/A	0.050	mg/L	2021-08-11	
Potassium, total	2.67	N/A	0.10	mg/L	2021-08-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-08-11	
Silicon, total	4.8	N/A	1.0	mg/L	2021-08-11	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-08-11	
Sodium, total	12.6	AO ≤ 200	0.10	mg/L	2021-08-11	
Strontium, total	0.306	7	0.0010	mg/L	2021-08-11	
Sulfur, total	8.3	N/A	3.0	mg/L	2021-08-11	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-08-11	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-08-11	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-08-11	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-08-11	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-08-11	
Uranium, total	0.00189	MAC = 0.02	0.000020	mg/L	2021-08-11	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-08-11	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2021-08-11	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	

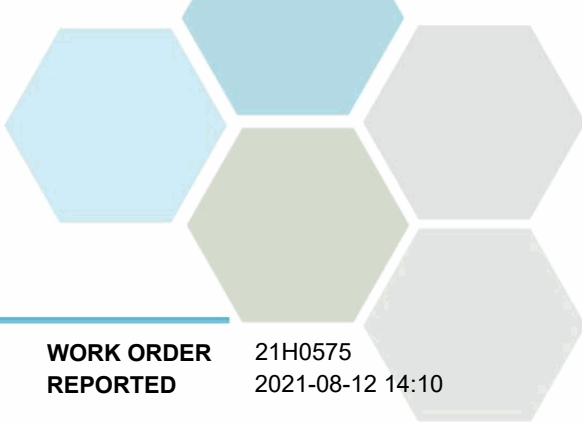
Trip Blank (21H0575-03) | Matrix: Water | Sampled: 2021-08-05

Anions

Chloride	< 0.10	AO ≤ 250	0.10	mg/L	2021-08-06	
Nitrate (as N)	< 0.010	MAC = 10	0.010	mg/L	2021-08-06	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2021-08-06	
Phosphate (as P)	< 0.0050	N/A	0.0050	mg/L	2021-08-06	
Sulfate	< 1.0	AO ≤ 500	1.0	mg/L	2021-08-06	

Calculated Parameters

Hardness, Total (as CaCO3)	< 0.500	None Required	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100	mg/L	N/A	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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Trip Blank (21H0575-03) | Matrix: Water | Sampled: 2021-08-05, Continued

Calculated Parameters, Continued

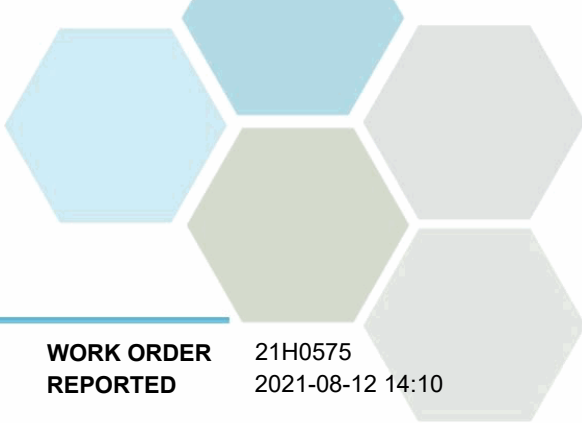
Nitrogen, Total	< 0.0500	N/A	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	N/A	0.0500	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.020	None Required	0.020	mg/L	2021-08-06	
Chlorophyll a	< 1.00	N/A	0.10	µg/L	2021-08-12	
Nitrogen, Total Kjeldahl	< 0.050	N/A	0.050	mg/L	2021-08-10	
Phosphorus, Total (as P)	< 0.0050	N/A	0.0050	mg/L	2021-08-10	

Total Metals

Aluminum, total	0.0070	OG < 0.1	0.0050	mg/L	2021-08-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2021-08-11	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2021-08-11	
Barium, total	< 0.0050	MAC = 2	0.0050	mg/L	2021-08-11	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2021-08-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-08-11	
Calcium, total	< 0.20	None Required	0.20	mg/L	2021-08-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-08-11	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	
Copper, total	< 0.00040	MAC = 2	0.00040	mg/L	2021-08-11	
Iron, total	< 0.010	AO ≤ 0.3	0.010	mg/L	2021-08-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-08-11	
Lithium, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	
Magnesium, total	< 0.010	None Required	0.010	mg/L	2021-08-11	
Manganese, total	< 0.00020	MAC = 0.12	0.00020	mg/L	2021-08-11	
Molybdenum, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	
Nickel, total	< 0.00040	N/A	0.00040	mg/L	2021-08-11	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2021-08-11	
Potassium, total	< 0.10	N/A	0.10	mg/L	2021-08-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-08-11	
Silicon, total	< 1.0	N/A	1.0	mg/L	2021-08-11	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-08-11	
Sodium, total	< 0.10	AO ≤ 200	0.10	mg/L	2021-08-11	
Strontium, total	< 0.0010	7	0.0010	mg/L	2021-08-11	
Sulfur, total	< 3.0	N/A	3.0	mg/L	2021-08-11	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-08-11	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-08-11	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-08-11	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-08-11	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-08-11	
Uranium, total	< 0.000020	MAC = 0.02	0.000020	mg/L	2021-08-11	

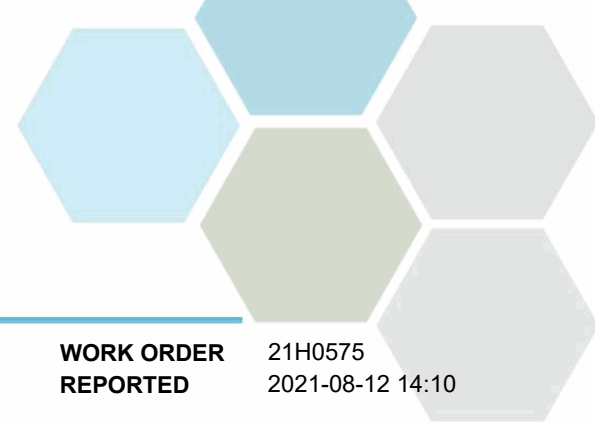


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21H0575
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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Trip Blank (21H0575-03) Matrix: Water Sampled: 2021-08-05, Continued						
<i>Total Metals, Continued</i>						
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-08-11	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2021-08-11	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-08-11	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

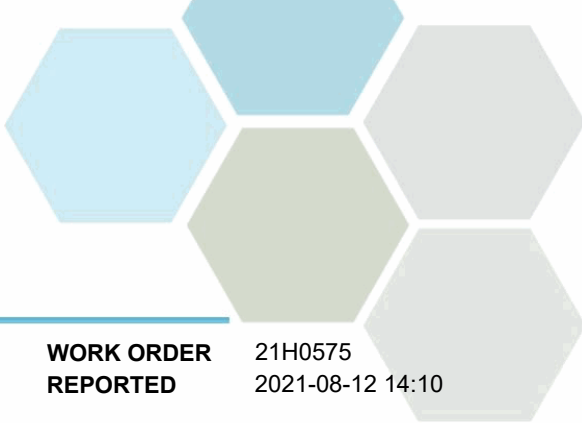
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

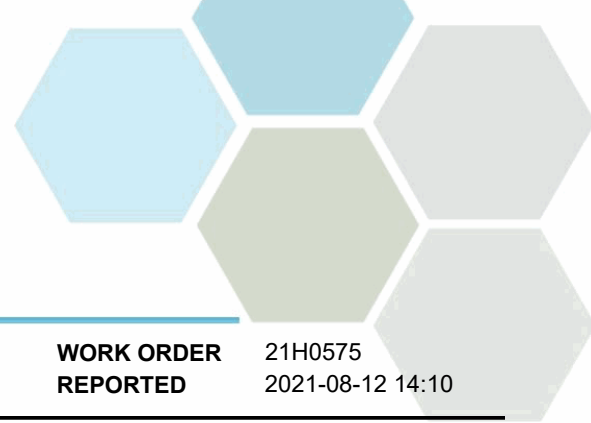
WORK ORDER REPORTED 21H0575
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General Comments:

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

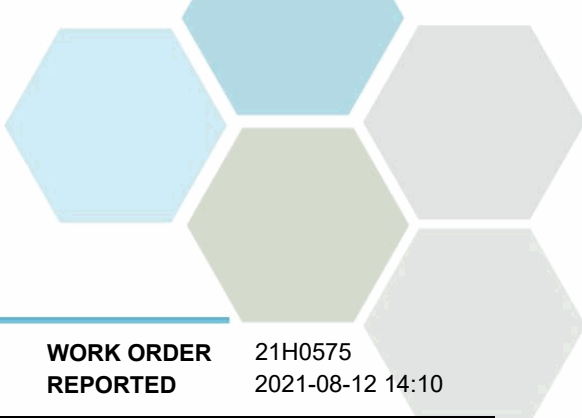
WORK ORDER REPORTED 21H0575
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the 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 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
Anions, Batch B1H0591									
Blank (B1H0591-BLK1)			Prepared: 2021-08-06, Analyzed: 2021-08-06						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
Blank (B1H0591-BLK2)			Prepared: 2021-08-07, Analyzed: 2021-08-07						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
LCS (B1H0591-BS1)			Prepared: 2021-08-06, Analyzed: 2021-08-06						
Chloride	15.9	0.10 mg/L	16.0		99	90-110			
Nitrate (as N)	4.08	0.010 mg/L	4.00		102	90-110			
Nitrite (as N)	1.95	0.010 mg/L	2.00		98	85-115			
Phosphate (as P)	0.962	0.0050 mg/L	1.00		96	80-120			
Sulfate	16.0	1.0 mg/L	16.0		100	90-110			
LCS (B1H0591-BS2)			Prepared: 2021-08-07, Analyzed: 2021-08-07						
Chloride	15.8	0.10 mg/L	16.0		99	90-110			
Nitrate (as N)	4.12	0.010 mg/L	4.00		103	90-110			
Nitrite (as N)	1.95	0.010 mg/L	2.00		97	85-115			
Phosphate (as P)	0.975	0.0050 mg/L	1.00		97	80-120			
Sulfate	16.2	1.0 mg/L	16.0		101	90-110			
Duplicate (B1H0591-DUP1)			Source: 21H0575-01		Prepared: 2021-08-06, Analyzed: 2021-08-06				
Chloride	5.79	0.10 mg/L		5.86			1	10	
Nitrate (as N)	< 0.010	0.010 mg/L		< 0.010				10	
Nitrite (as N)	< 0.010	0.010 mg/L		< 0.010				15	
Phosphate (as P)	< 0.0050	0.0050 mg/L		< 0.0050				20	
Sulfate	28.2	1.0 mg/L		28.1			< 1	10	
Matrix Spike (B1H0591-MS1)			Source: 21H0575-01		Prepared: 2021-08-06, Analyzed: 2021-08-06				
Chloride	20.8	0.10 mg/L	16.0	5.86	94	75-125			
Nitrate (as N)	3.87	0.010 mg/L	4.00	< 0.010	97	75-125			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls (Vaseux Lake) via LAC	WORK ORDER REPORTED	21H0575 2021-08-12 14:10
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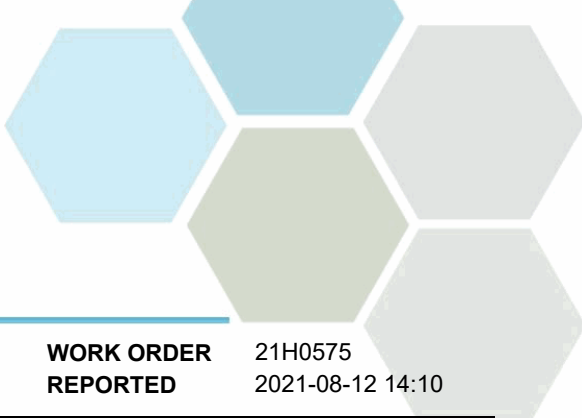
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B1H0591, Continued									
Matrix Spike (B1H0591-MS1), Continued		Source: 21H0575-01		Prepared: 2021-08-06, Analyzed: 2021-08-06					
Nitrite (as N)	1.85	0.010 mg/L	2.00	< 0.010	93	80-120			
Phosphate (as P)	0.821	0.0050 mg/L	1.00	< 0.0050	82	70-130			
Sulfate	44.2	1.0 mg/L	16.0	28.1	100	75-125			

General Parameters, Batch B1H0575									
Blank (B1H0575-BLK1)		Prepared: 2021-08-06, Analyzed: 2021-08-12							
Chlorophyll a	< 0.10	0.10 µg/L							

General Parameters, Batch B1H0623									
Blank (B1H0623-BLK1)		Prepared: 2021-08-06, Analyzed: 2021-08-06							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1H0623-BLK2)		Prepared: 2021-08-06, Analyzed: 2021-08-06							
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
LCS (B1H0623-BS1)		Prepared: 2021-08-06, Analyzed: 2021-08-06							
Ammonia, Total (as N)	0.956	0.020 mg/L	1.00		96	90-115			
LCS (B1H0623-BS2)		Prepared: 2021-08-06, Analyzed: 2021-08-06							
Ammonia, Total (as N)	0.952	0.020 mg/L	1.00		95	90-115			

General Parameters, Batch B1H0807									
Blank (B1H0807-BLK1)		Prepared: 2021-08-09, Analyzed: 2021-08-10							
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B1H0807-BLK2)		Prepared: 2021-08-09, Analyzed: 2021-08-10							
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1H0807-BS1)		Prepared: 2021-08-09, Analyzed: 2021-08-10							
Nitrogen, Total Kjeldahl	0.888	0.050 mg/L	1.00		89	85-115			
LCS (B1H0807-BS2)		Prepared: 2021-08-09, Analyzed: 2021-08-10							
Nitrogen, Total Kjeldahl	0.894	0.050 mg/L	1.00		89	85-115			
Duplicate (B1H0807-DUP1)		Source: 21H0575-02		Prepared: 2021-08-09, Analyzed: 2021-08-10					
Nitrogen, Total Kjeldahl	0.365	0.050 mg/L		0.393			7	15	
Matrix Spike (B1H0807-MS1)		Source: 21H0575-02		Prepared: 2021-08-09, Analyzed: 2021-08-10					
Nitrogen, Total Kjeldahl	2.33	0.100 mg/L	2.00	0.393	97	65-135			

General Parameters, Batch B1H0835									
Blank (B1H0835-BLK1)		Prepared: 2021-08-09, Analyzed: 2021-08-10							
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Blank (B1H0835-BLK2)		Prepared: 2021-08-09, Analyzed: 2021-08-10							
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
LCS (B1H0835-BS1)		Prepared: 2021-08-09, Analyzed: 2021-08-10							
Phosphorus, Total (as P)	0.106	0.0050 mg/L	0.100		106	85-115			
LCS (B1H0835-BS2)		Prepared: 2021-08-09, Analyzed: 2021-08-10							
Phosphorus, Total Dissolved	0.104	0.0050 mg/L	0.100		104	85-115			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

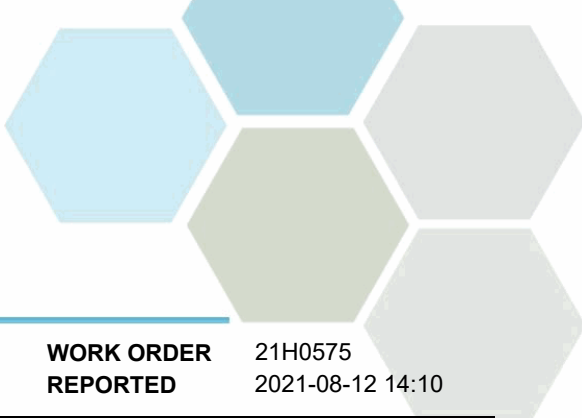
WORK ORDER REPORTED 21H0575
2021-08-12 14:10

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1H0921

Blank (B1H0921-BLK1)		Prepared: 2021-08-11, Analyzed: 2021-08-11							
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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							

Blank (B1H0921-BLK2)		Prepared: 2021-08-11, Analyzed: 2021-08-11							
Aluminum, total	0.0058	0.0050 mg/L							BLK
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							

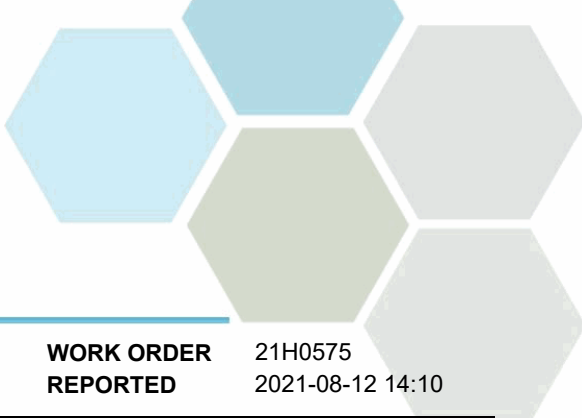


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21H0575
2021-08-12 14:10

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1H0921, Continued									
Blank (B1H0921-BLK2), Continued					Prepared: 2021-08-11, Analyzed: 2021-08-11				
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B1H0921-BS1)					Prepared: 2021-08-11, Analyzed: 2021-08-11				
Aluminum, total	0.0207	0.0050 mg/L	0.0199		104	80-120			
Antimony, total	0.0178	0.00020 mg/L	0.0200		89	80-120			
Arsenic, total	0.0175	0.00050 mg/L	0.0200		88	80-120			
Barium, total	0.0184	0.0050 mg/L	0.0198		93	80-120			
Beryllium, total	0.0183	0.00010 mg/L	0.0198		92	80-120			
Bismuth, total	0.0186	0.00010 mg/L	0.0200		93	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		88	80-120			
Cadmium, total	0.0182	0.000010 mg/L	0.0199		92	80-120			
Calcium, total	1.87	0.20 mg/L	2.02		92	80-120			
Chromium, total	0.0183	0.00050 mg/L	0.0198		92	80-120			
Cobalt, total	0.0184	0.00010 mg/L	0.0199		92	80-120			
Copper, total	0.0179	0.00040 mg/L	0.0200		90	80-120			
Iron, total	1.76	0.010 mg/L	2.02		87	80-120			
Lead, total	0.0203	0.00020 mg/L	0.0199		102	80-120			
Lithium, total	0.0190	0.00010 mg/L	0.0200		95	80-120			
Magnesium, total	1.84	0.010 mg/L	2.02		91	80-120			
Manganese, total	0.0171	0.00020 mg/L	0.0199		86	80-120			
Molybdenum, total	0.0174	0.00010 mg/L	0.0200		87	80-120			
Nickel, total	0.0186	0.00040 mg/L	0.0200		93	80-120			
Phosphorus, total	1.83	0.050 mg/L	2.00		92	80-120			
Potassium, total	1.90	0.10 mg/L	2.02		94	80-120			
Selenium, total	0.0187	0.00050 mg/L	0.0200		93	80-120			
Silicon, total	1.9	1.0 mg/L	2.00		95	80-120			
Silver, total	0.0173	0.000050 mg/L	0.0200		87	80-120			
Sodium, total	1.94	0.10 mg/L	2.02		96	80-120			
Strontium, total	0.0178	0.0010 mg/L	0.0200		89	80-120			
Sulfur, total	4.3	3.0 mg/L	5.00		85	80-120			
Tellurium, total	0.0179	0.00050 mg/L	0.0200		89	80-120			
Thallium, total	0.0178	0.000020 mg/L	0.0199		89	80-120			
Thorium, total	0.0176	0.00010 mg/L	0.0200		88	80-120			
Tin, total	0.0186	0.00020 mg/L	0.0200		93	80-120			
Titanium, total	0.0157	0.0050 mg/L	0.0200		79	80-120			SPK1
Tungsten, total	0.0197	0.0010 mg/L	0.0200		98	80-120			
Uranium, total	0.0178	0.000020 mg/L	0.0200		89	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21H0575
2021-08-12 14:10

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1H0921, Continued

LCS (B1H0921-BS1), Continued

Prepared: 2021-08-11, Analyzed: 2021-08-11

Vanadium, total	0.0183	0.0010 mg/L	0.0200		92	80-120			
Zinc, total	0.0214	0.0040 mg/L	0.0200		107	80-120			
Zirconium, total	0.0186	0.00010 mg/L	0.0200		93	80-120			

LCS (B1H0921-BS2)

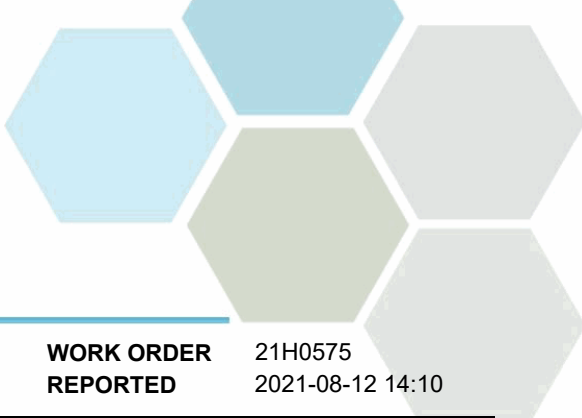
Prepared: 2021-08-11, Analyzed: 2021-08-11

Aluminum, total	0.0224	0.0050 mg/L	0.0199		113	80-120			
Antimony, total	0.0184	0.00020 mg/L	0.0200		92	80-120			
Arsenic, total	0.0177	0.00050 mg/L	0.0200		88	80-120			
Barium, total	0.0181	0.0050 mg/L	0.0198		91	80-120			
Beryllium, total	0.0189	0.00010 mg/L	0.0198		95	80-120			
Bismuth, total	0.0191	0.00010 mg/L	0.0200		95	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		97	80-120			
Cadmium, total	0.0184	0.000010 mg/L	0.0199		92	80-120			
Calcium, total	1.90	0.20 mg/L	2.02		94	80-120			
Chromium, total	0.0184	0.00050 mg/L	0.0198		93	80-120			
Cobalt, total	0.0181	0.00010 mg/L	0.0199		91	80-120			
Copper, total	0.0178	0.00040 mg/L	0.0200		89	80-120			
Iron, total	1.78	0.010 mg/L	2.02		88	80-120			
Lead, total	0.0208	0.00020 mg/L	0.0199		105	80-120			
Lithium, total	0.0206	0.00010 mg/L	0.0200		103	80-120			
Magnesium, total	1.86	0.010 mg/L	2.02		92	80-120			
Manganese, total	0.0170	0.00020 mg/L	0.0199		85	80-120			
Molybdenum, total	0.0179	0.00010 mg/L	0.0200		89	80-120			
Nickel, total	0.0185	0.00040 mg/L	0.0200		93	80-120			
Phosphorus, total	1.86	0.050 mg/L	2.00		93	80-120			
Potassium, total	1.95	0.10 mg/L	2.02		97	80-120			
Selenium, total	0.0183	0.00050 mg/L	0.0200		92	80-120			
Silicon, total	2.0	1.0 mg/L	2.00		100	80-120			
Silver, total	0.0177	0.000050 mg/L	0.0200		88	80-120			
Sodium, total	1.97	0.10 mg/L	2.02		98	80-120			
Strontium, total	0.0181	0.0010 mg/L	0.0200		91	80-120			
Sulfur, total	5.0	3.0 mg/L	5.00		101	80-120			
Tellurium, total	0.0174	0.00050 mg/L	0.0200		87	80-120			
Thallium, total	0.0181	0.000020 mg/L	0.0199		91	80-120			
Thorium, total	0.0180	0.00010 mg/L	0.0200		90	80-120			
Tin, total	0.0186	0.00020 mg/L	0.0200		93	80-120			
Titanium, total	0.0190	0.0050 mg/L	0.0200		95	80-120			
Tungsten, total	0.0202	0.0010 mg/L	0.0200		101	80-120			
Uranium, total	0.0182	0.000020 mg/L	0.0200		91	80-120			
Vanadium, total	0.0187	0.0010 mg/L	0.0200		93	80-120			
Zinc, total	0.0166	0.0040 mg/L	0.0200		83	80-120			
Zirconium, total	0.0186	0.00010 mg/L	0.0200		93	80-120			

Reference (B1H0921-SRM1)

Prepared: 2021-08-11, Analyzed: 2021-08-11

Aluminum, total	0.288	0.0050 mg/L	0.299		96	70-130			
Antimony, total	0.0491	0.00020 mg/L	0.0517		95	70-130			
Arsenic, total	0.121	0.00050 mg/L	0.119		102	70-130			
Barium, total	0.744	0.0050 mg/L	0.801		93	70-130			
Beryllium, total	0.0502	0.00010 mg/L	0.0501		100	70-130			
Boron, total	3.80	0.0500 mg/L	4.11		92	70-130			
Cadmium, total	0.0488	0.000010 mg/L	0.0503		97	70-130			
Calcium, total	9.88	0.20 mg/L	10.7		92	70-130			
Chromium, total	0.248	0.00050 mg/L	0.250		99	70-130			
Cobalt, total	0.0382	0.00010 mg/L	0.0384		100	70-130			
Copper, total	0.466	0.00040 mg/L	0.487		96	70-130			
Iron, total	0.491	0.010 mg/L	0.504		97	70-130			
Lead, total	0.291	0.00020 mg/L	0.278		105	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21H0575
2021-08-12 14:10

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1H0921, Continued									
Reference (B1H0921-SRM1), Continued					Prepared: 2021-08-11, Analyzed: 2021-08-11				
Lithium, total	0.420	0.00010 mg/L	0.398		106	70-130			
Magnesium, total	3.68	0.010 mg/L	3.59		103	70-130			
Manganese, total	0.100	0.00020 mg/L	0.111		90	70-130			
Molybdenum, total	0.193	0.00010 mg/L	0.196		98	70-130			
Nickel, total	0.251	0.00040 mg/L	0.248		101	70-130			
Phosphorus, total	0.220	0.050 mg/L	0.213		103	70-130			
Potassium, total	6.27	0.10 mg/L	5.89		107	70-130			
Selenium, total	0.126	0.00050 mg/L	0.120		105	70-130			
Sodium, total	9.47	0.10 mg/L	8.71		109	70-130			
Strontium, total	0.380	0.0010 mg/L	0.393		97	70-130			
Thallium, total	0.0771	0.000020 mg/L	0.0787		98	70-130			
Uranium, total	0.0335	0.000020 mg/L	0.0344		97	70-130			
Vanadium, total	0.382	0.0010 mg/L	0.391		98	70-130			
Zinc, total	2.46	0.0040 mg/L	2.50		98	70-130			
Reference (B1H0921-SRM2)					Prepared: 2021-08-11, Analyzed: 2021-08-11				
Aluminum, total	0.310	0.0050 mg/L	0.299		104	70-130			
Antimony, total	0.0502	0.00020 mg/L	0.0517		97	70-130			
Arsenic, total	0.120	0.00050 mg/L	0.119		101	70-130			
Barium, total	0.762	0.0050 mg/L	0.801		95	70-130			
Beryllium, total	0.0508	0.00010 mg/L	0.0501		101	70-130			
Boron, total	4.01	0.0500 mg/L	4.11		98	70-130			
Cadmium, total	0.0503	0.000010 mg/L	0.0503		100	70-130			
Calcium, total	10.1	0.20 mg/L	10.7		95	70-130			
Chromium, total	0.248	0.00050 mg/L	0.250		99	70-130			
Cobalt, total	0.0380	0.00010 mg/L	0.0384		99	70-130			
Copper, total	0.464	0.00040 mg/L	0.487		95	70-130			
Iron, total	0.490	0.010 mg/L	0.504		97	70-130			
Lead, total	0.293	0.00020 mg/L	0.278		105	70-130			
Lithium, total	0.445	0.00010 mg/L	0.398		112	70-130			
Magnesium, total	3.63	0.010 mg/L	3.59		101	70-130			
Manganese, total	0.101	0.00020 mg/L	0.111		91	70-130			
Molybdenum, total	0.195	0.00010 mg/L	0.196		100	70-130			
Nickel, total	0.249	0.00040 mg/L	0.248		101	70-130			
Phosphorus, total	0.243	0.050 mg/L	0.213		114	70-130			
Potassium, total	6.33	0.10 mg/L	5.89		108	70-130			
Selenium, total	0.128	0.00050 mg/L	0.120		107	70-130			
Sodium, total	9.37	0.10 mg/L	8.71		108	70-130			
Strontium, total	0.385	0.0010 mg/L	0.393		98	70-130			
Thallium, total	0.0769	0.000020 mg/L	0.0787		98	70-130			
Uranium, total	0.0334	0.000020 mg/L	0.0344		97	70-130			
Vanadium, total	0.381	0.0010 mg/L	0.391		98	70-130			
Zinc, total	2.47	0.0040 mg/L	2.50		99	70-130			

QC Qualifiers:

- BLK Analyte concentration in the Method Blank is above the Reporting Limit (RL).
- SPK1 The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	2110553
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-09-03 15:10 / 13.5°C
PO NUMBER	OK Falls (Vaseux Lake) via LAC	REPORTED	2021-09-10 15:51
PROJECT	OK Falls (Vaseux Lake) via LAC	COC NUMBER	44174.36895
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

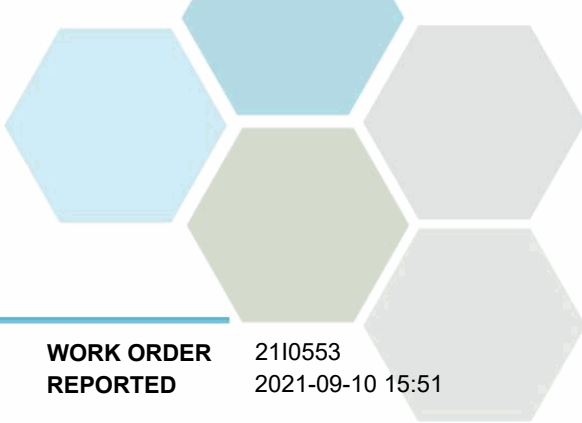
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 2110553
2021-09-10 15:51

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite (2110553-01) | Matrix: Water | Sampled: 2021-09-03 10:15

Anions

Chloride	5.91	AO ≤ 250	0.10 mg/L	2021-09-04	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-09-04	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-09-04	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-09-04	
Sulfate	29.3	AO ≤ 500	1.0 mg/L	2021-09-04	

Calculated Parameters

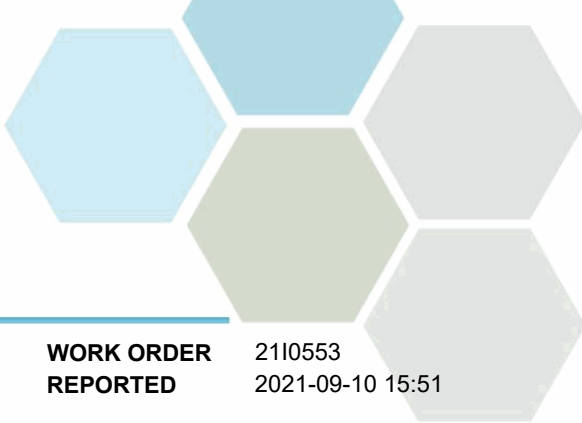
Hardness, Total (as CaCO3)	120	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.192	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.192	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.020	None Required	0.020 mg/L	2021-09-08	
Chlorophyll a	1.24	N/A	0.10 µg/L	2021-09-09	
Nitrogen, Total Kjeldahl	0.192	N/A	0.050 mg/L	2021-09-10	
Phosphorus, Total (as P)	0.0103	N/A	0.0050 mg/L	2021-09-10	
Phosphorus, Total Dissolved	0.0077	N/A	0.0050 mg/L	2021-09-10	

Total Metals

Aluminum, total	0.0149	OG < 0.1	0.0050 mg/L	2021-09-09	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-09-09	
Arsenic, total	0.00050	MAC = 0.01	0.00050 mg/L	2021-09-09	
Barium, total	0.0238	MAC = 2	0.0050 mg/L	2021-09-09	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-09-09	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-09-09	
Calcium, total	31.9	None Required	0.20 mg/L	2021-09-09	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-09-09	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	
Copper, total	0.00139	MAC = 2	0.00040 mg/L	2021-09-09	
Iron, total	0.025	AO ≤ 0.3	0.010 mg/L	2021-09-09	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-09-09	
Lithium, total	0.00358	N/A	0.00010 mg/L	2021-09-09	
Magnesium, total	9.70	None Required	0.010 mg/L	2021-09-09	
Manganese, total	0.00555	MAC = 0.12	0.00020 mg/L	2021-09-09	
Molybdenum, total	0.00343	N/A	0.00010 mg/L	2021-09-09	
Nickel, total	< 0.00040	N/A	0.00040 mg/L	2021-09-09	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-09-09	
Potassium, total	2.55	N/A	0.10 mg/L	2021-09-09	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-09-09	
Silicon, total	3.3	N/A	1.0 mg/L	2021-09-09	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-09-09	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10 m composite (2110553-01) Matrix: Water Sampled: 2021-09-03 10:15, Continued					
<i>Total Metals, Continued</i>					
Sodium, total	12.5	AO ≤ 200	0.10 mg/L	2021-09-09	
Strontium, total	0.288	7	0.0010 mg/L	2021-09-09	
Sulfur, total	12.2	N/A	3.0 mg/L	2021-09-09	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-09-09	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-09-09	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-09-09	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-09-09	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-09-09	
Uranium, total	0.00238	MAC = 0.02	0.000020 mg/L	2021-09-09	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-09-09	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-09-09	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	

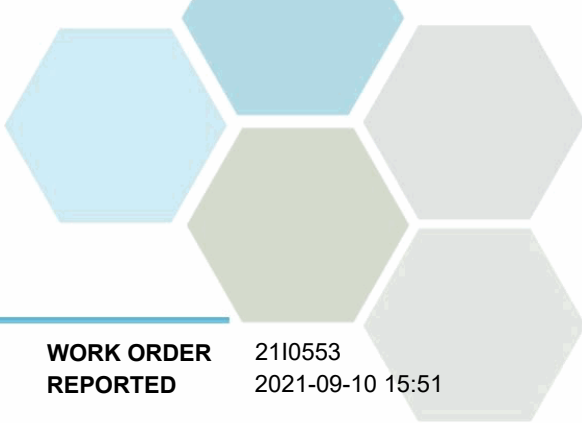
Vaseux 20, 22, 24 m composite (2110553-02) | Matrix: Water | Sampled: 2021-09-03 10:15

<i>Anions</i>					
Chloride	5.94	AO ≤ 250	0.10 mg/L	2021-09-04	
Nitrate (as N)	0.022	MAC = 10	0.010 mg/L	2021-09-04	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-09-04	
Phosphate (as P)	0.0646	N/A	0.0050 mg/L	2021-09-04	
Sulfate	25.0	AO ≤ 500	1.0 mg/L	2021-09-04	

<i>Calculated Parameters</i>					
Hardness, Total (as CaCO3)	124	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	0.0221	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.353	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.146	N/A	0.0500 mg/L	N/A	

<i>General Parameters</i>					
Ammonia, Total (as N)	0.185	None Required	0.020 mg/L	2021-09-08	
Chlorophyll a	0.32	N/A	0.10 µg/L	2021-09-09	
Nitrogen, Total Kjeldahl	0.331	N/A	0.050 mg/L	2021-09-10	
Phosphorus, Total (as P)	0.132	N/A	0.0050 mg/L	2021-09-10	
Phosphorus, Total Dissolved	0.0732	N/A	0.0050 mg/L	2021-09-10	

<i>Total Metals</i>					
Aluminum, total	0.0404	OG < 0.1	0.0050 mg/L	2021-09-09	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-09-09	
Arsenic, total	0.00085	MAC = 0.01	0.00050 mg/L	2021-09-09	
Barium, total	0.0254	MAC = 2	0.0050 mg/L	2021-09-09	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-09-09	

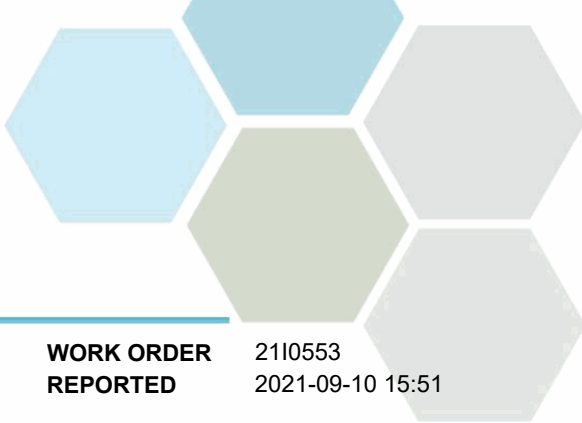


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 2110553
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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 20, 22, 24 m composite (2110553-02) Matrix: Water Sampled: 2021-09-03 10:15, Continued					
<i>Total Metals, Continued</i>					
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-09-09	
Calcium, total	33.6	None Required	0.20 mg/L	2021-09-09	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-09-09	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	
Copper, total	0.00067	MAC = 2	0.00040 mg/L	2021-09-09	
Iron, total	0.433	AO ≤ 0.3	0.010 mg/L	2021-09-09	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-09-09	
Lithium, total	0.00356	N/A	0.00010 mg/L	2021-09-09	
Magnesium, total	9.75	None Required	0.010 mg/L	2021-09-09	
Manganese, total	0.470	MAC = 0.12	0.00020 mg/L	2021-09-09	
Molybdenum, total	0.00304	N/A	0.00010 mg/L	2021-09-09	
Nickel, total	0.00046	N/A	0.00040 mg/L	2021-09-09	
Phosphorus, total	0.114	N/A	0.050 mg/L	2021-09-09	
Potassium, total	2.63	N/A	0.10 mg/L	2021-09-09	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-09-09	
Silicon, total	5.6	N/A	1.0 mg/L	2021-09-09	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-09-09	
Sodium, total	12.4	AO ≤ 200	0.10 mg/L	2021-09-09	
Strontium, total	0.305	7	0.0010 mg/L	2021-09-09	
Sulfur, total	11.2	N/A	3.0 mg/L	2021-09-09	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-09-09	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-09-09	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-09-09	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-09-09	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-09-09	
Uranium, total	0.00189	MAC = 0.02	0.000020 mg/L	2021-09-09	
Vanadium, total	< 0.0010	N/A	0.0010 mg/L	2021-09-09	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-09-09	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-09-09	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

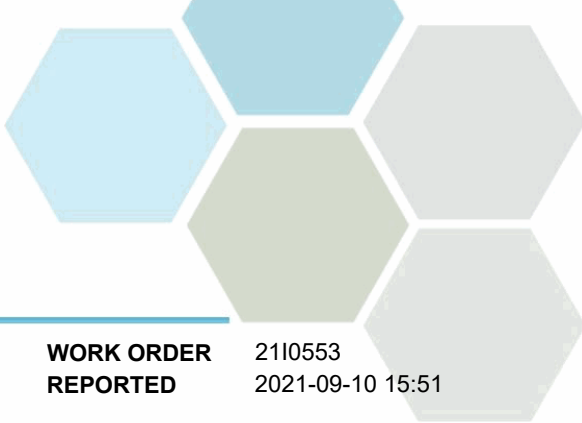
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

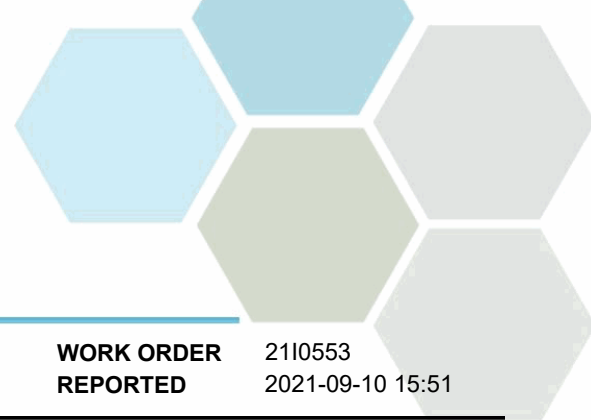
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General Comments:

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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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 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.

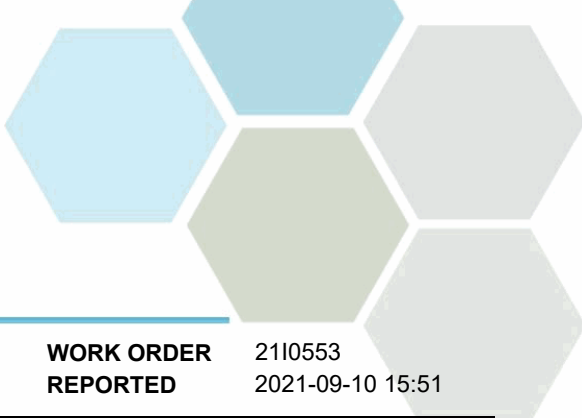
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B110574									
Blank (B110574-BLK1)			Prepared: 2021-09-04, Analyzed: 2021-09-04						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
LCS (B110574-BS1)			Prepared: 2021-09-04, Analyzed: 2021-09-04						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	4.16	0.010 mg/L	4.00		104	90-110			
Nitrite (as N)	1.93	0.010 mg/L	2.00		97	85-115			
Phosphate (as P)	1.03	0.0050 mg/L	1.00		103	80-120			
Sulfate	16.1	1.0 mg/L	16.0		100	90-110			
Duplicate (B110574-DUP1)			Source: 2110553-01		Prepared: 2021-09-04, Analyzed: 2021-09-04				
Chloride	5.93	0.10 mg/L		5.91			< 1	10	
Nitrate (as N)	< 0.010	0.010 mg/L		< 0.010				10	
Nitrite (as N)	< 0.010	0.010 mg/L		< 0.010				15	
Phosphate (as P)	< 0.0050	0.0050 mg/L		< 0.0050				20	
Sulfate	29.1	1.0 mg/L		29.3			< 1	10	
Matrix Spike (B110574-MS1)			Source: 2110553-01		Prepared: 2021-09-04, Analyzed: 2021-09-04				
Chloride	21.8	0.10 mg/L	16.0	5.91	99	75-125			
Nitrate (as N)	3.98	0.010 mg/L	4.00	< 0.010	99	75-125			
Nitrite (as N)	1.90	0.010 mg/L	2.00	< 0.010	95	80-120			
Phosphate (as P)	0.979	0.0050 mg/L	1.00	< 0.0050	98	70-130			
Sulfate	45.4	1.0 mg/L	16.0	29.3	101	75-125			

General Parameters, Batch B110552

Blank (B110552-BLK1)			Prepared: 2021-09-04, Analyzed: 2021-09-09						
Chlorophyll a	< 0.10	0.10 µg/L							

General Parameters, Batch B110771

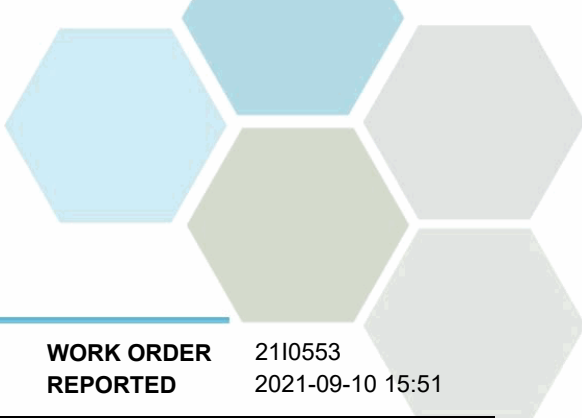
Blank (B110771-BLK1)			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls (Vaseux Lake) via LAC	WORK ORDER REPORTED	2110553 2021-09-10 15:51
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B110771, Continued									
Blank (B110771-BLK1), Continued			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Blank (B110771-BLK2)			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B110771-BLK3)			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B110771-BLK4)			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
LCS (B110771-BS1)			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Ammonia, Total (as N)	0.959	0.020 mg/L	1.00		96	90-115			
LCS (B110771-BS2)			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Ammonia, Total (as N)	0.955	0.020 mg/L	1.00		96	90-115			
LCS (B110771-BS3)			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Ammonia, Total (as N)	0.930	0.020 mg/L	1.00		93	90-115			
LCS (B110771-BS4)			Prepared: 2021-09-08, Analyzed: 2021-09-08						
Ammonia, Total (as N)	0.970	0.020 mg/L	1.00		97	90-115			
General Parameters, Batch B110938									
Blank (B110938-BLK1)			Prepared: 2021-09-09, Analyzed: 2021-09-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B110938-BLK2)			Prepared: 2021-09-09, Analyzed: 2021-09-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B110938-BS1)			Prepared: 2021-09-09, Analyzed: 2021-09-10						
Nitrogen, Total Kjeldahl	0.931	0.050 mg/L	1.00		93	85-115			
LCS (B110938-BS2)			Prepared: 2021-09-09, Analyzed: 2021-09-10						
Nitrogen, Total Kjeldahl	0.926	0.050 mg/L	1.00		93	85-115			
General Parameters, Batch B111001									
Blank (B111001-BLK1)			Prepared: 2021-09-09, Analyzed: 2021-09-10						
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
Blank (B111001-BLK2)			Prepared: 2021-09-09, Analyzed: 2021-09-10						
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
LCS (B111001-BS1)			Prepared: 2021-09-09, Analyzed: 2021-09-10						
Phosphorus, Total (as P)	0.102	0.0050 mg/L	0.100		102	85-115			
Phosphorus, Total Dissolved	0.104	0.0050 mg/L	0.100		104	85-115			
LCS (B111001-BS2)			Prepared: 2021-09-09, Analyzed: 2021-09-10						
Phosphorus, Total Dissolved	0.104	0.0050 mg/L	0.100		104	85-115			
Total Metals, Batch B110809									
Blank (B110809-BLK1)			Prepared: 2021-09-08, Analyzed: 2021-09-09						
Aluminum, total	< 0.0050	0.0050 mg/L							



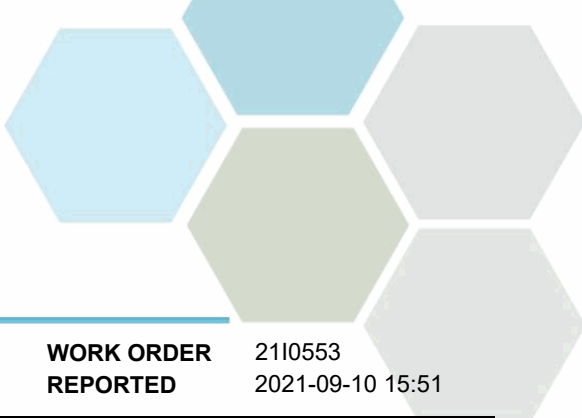
APPENDIX 2: QUALITY CONTROL RESULTS

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OK Falls (Vaseux Lake) via LAC

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2021-09-10 15:51

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B110809, Continued									
Blank (B110809-BLK1), Continued					Prepared: 2021-09-08, Analyzed: 2021-09-09				
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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							

Blank (B110809-BLK2)					Prepared: 2021-09-08, Analyzed: 2021-09-09				
Aluminum, total	0.0062	0.0050 mg/L							BLK
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	0.00014	0.00010 mg/L							BLK
Magnesium, total	< 0.010	0.010 mg/L							
Manganese, total	< 0.00020	0.00020 mg/L							
Molybdenum, total	< 0.00010	0.00010 mg/L							



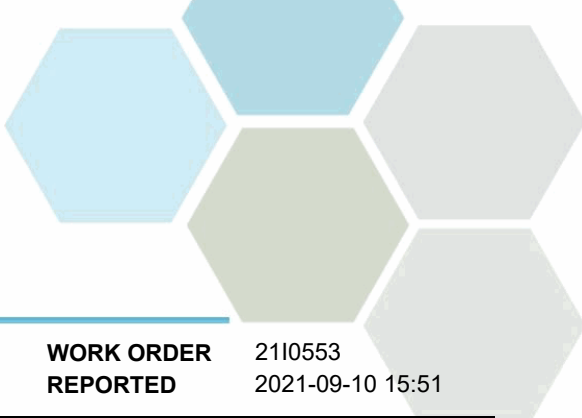
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 2110553
2021-09-10 15:51

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B110809, Continued									
Blank (B110809-BLK2), Continued					Prepared: 2021-09-08, Analyzed: 2021-09-09				
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B110809-BS1)					Prepared: 2021-09-08, Analyzed: 2021-09-09				
Aluminum, total	0.0227	0.0050 mg/L	0.0200		113	80-120			
Antimony, total	0.0197	0.00020 mg/L	0.0200		98	80-120			
Arsenic, total	0.0189	0.00050 mg/L	0.0200		94	80-120			
Barium, total	0.0187	0.0050 mg/L	0.0200		93	80-120			
Beryllium, total	0.0202	0.00010 mg/L	0.0200		101	80-120			
Bismuth, total	0.0203	0.00010 mg/L	0.0200		101	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		101	80-120			
Cadmium, total	0.0192	0.000010 mg/L	0.0200		96	80-120			
Calcium, total	1.88	0.20 mg/L	2.00		94	80-120			
Chromium, total	0.0190	0.00050 mg/L	0.0200		95	80-120			
Cobalt, total	0.0193	0.00010 mg/L	0.0200		97	80-120			
Copper, total	0.0198	0.00040 mg/L	0.0200		99	80-120			
Iron, total	1.93	0.010 mg/L	2.00		96	80-120			
Lead, total	0.0204	0.00020 mg/L	0.0200		102	80-120			
Lithium, total	0.0208	0.00010 mg/L	0.0200		104	80-120			
Magnesium, total	2.07	0.010 mg/L	2.00		104	80-120			
Manganese, total	0.0197	0.00020 mg/L	0.0200		98	80-120			
Molybdenum, total	0.0187	0.00010 mg/L	0.0200		94	80-120			
Nickel, total	0.0196	0.00040 mg/L	0.0200		98	80-120			
Phosphorus, total	2.05	0.050 mg/L	2.00		103	80-120			
Potassium, total	1.94	0.10 mg/L	2.00		97	80-120			
Selenium, total	0.0201	0.00050 mg/L	0.0200		101	80-120			
Silicon, total	2.0	1.0 mg/L	2.00		100	80-120			
Silver, total	0.0193	0.000050 mg/L	0.0200		97	80-120			
Sodium, total	2.01	0.10 mg/L	2.00		100	80-120			
Strontium, total	0.0180	0.0010 mg/L	0.0200		90	80-120			
Sulfur, total	< 3.0	3.0 mg/L	2.50		106	80-120			
Tellurium, total	0.0196	0.00050 mg/L	0.0200		98	80-120			
Thallium, total	0.0201	0.000020 mg/L	0.0200		100	80-120			
Thorium, total	0.0184	0.00010 mg/L	0.0200		92	80-120			
Tin, total	0.0198	0.00020 mg/L	0.0200		99	80-120			
Titanium, total	0.0203	0.0050 mg/L	0.0200		102	80-120			
Tungsten, total	0.0192	0.0010 mg/L	0.0200		96	80-120			
Uranium, total	0.0193	0.000020 mg/L	0.0200		96	80-120			
Vanadium, total	0.0207	0.0010 mg/L	0.0200		103	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 2110553
2021-09-10 15:51

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B110809, Continued									
LCS (B110809-BS1), Continued					Prepared: 2021-09-08, Analyzed: 2021-09-09				
Zinc, total	0.0210	0.0040 mg/L	0.0200		105	80-120			
Zirconium, total	0.0194	0.00010 mg/L	0.0200		97	80-120			
Reference (B110809-SRM1)					Prepared: 2021-09-08, Analyzed: 2021-09-09				
Aluminum, total	0.297	0.0050 mg/L	0.299		99	70-130			
Antimony, total	0.0513	0.00020 mg/L	0.0517		99	70-130			
Arsenic, total	0.121	0.00050 mg/L	0.119		101	70-130			
Barium, total	0.729	0.0050 mg/L	0.801		91	70-130			
Beryllium, total	0.0497	0.00010 mg/L	0.0501		99	70-130			
Boron, total	3.89	0.0500 mg/L	4.11		95	70-130			
Cadmium, total	0.0484	0.000010 mg/L	0.0503		96	70-130			
Calcium, total	10.1	0.20 mg/L	10.7		95	70-130			
Chromium, total	0.244	0.00050 mg/L	0.250		97	70-130			
Cobalt, total	0.0385	0.00010 mg/L	0.0384		100	70-130			
Copper, total	0.495	0.00040 mg/L	0.487		102	70-130			
Iron, total	0.503	0.010 mg/L	0.504		100	70-130			
Lead, total	0.283	0.00020 mg/L	0.278		102	70-130			
Lithium, total	0.412	0.00010 mg/L	0.398		104	70-130			
Magnesium, total	3.74	0.010 mg/L	3.59		104	70-130			
Manganese, total	0.108	0.00020 mg/L	0.111		98	70-130			
Molybdenum, total	0.200	0.00010 mg/L	0.196		102	70-130			
Nickel, total	0.246	0.00040 mg/L	0.248		99	70-130			
Phosphorus, total	0.227	0.050 mg/L	0.213		107	70-130			
Potassium, total	5.79	0.10 mg/L	5.89		98	70-130			
Selenium, total	0.118	0.00050 mg/L	0.120		99	70-130			
Sodium, total	9.09	0.10 mg/L	8.71		104	70-130			
Strontium, total	0.358	0.0010 mg/L	0.393		91	70-130			
Thallium, total	0.0800	0.000020 mg/L	0.0787		102	70-130			
Uranium, total	0.0329	0.000020 mg/L	0.0344		96	70-130			
Vanadium, total	0.378	0.0010 mg/L	0.391		97	70-130			
Zinc, total	2.43	0.0040 mg/L	2.50		97	70-130			

QC Qualifiers:

BLK Analyte concentration in the Method Blank is above the Reporting Limit (RL).



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21J1096
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-10-07 16:00 / 8.2°C 2021-10-18 16:20
PO NUMBER	OK Falls (Vaseux Lake) via LAC	COC NUMBER	44174.36895
PROJECT	OK Falls (Vaseux Lake) via LAC		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: YES

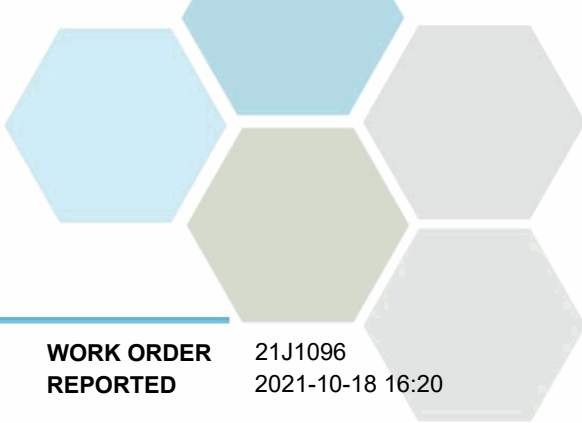
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
2021-10-18 16:20

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite (21J1096-01) | Matrix: Water | Sampled: 2021-10-07 10:00

Anions

Chloride	6.02	AO ≤ 250	0.10 mg/L	2021-10-12	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-10-12	HT1
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-10-12	HT1
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-10-12	HT1
Sulfate	29.1	AO ≤ 500	1.0 mg/L	2021-10-12	

Calculated Parameters

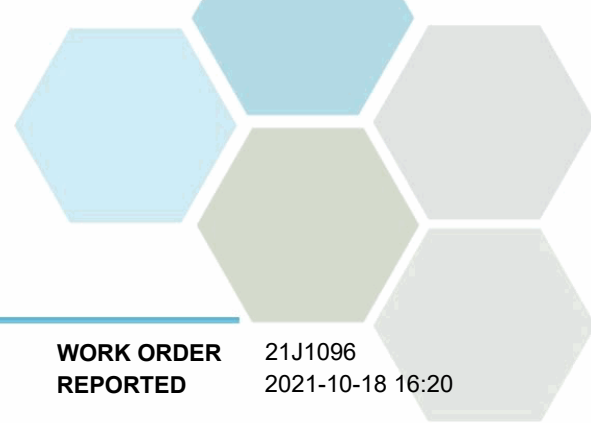
Hardness, Total (as CaCO3)	118	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.244	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.224	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.020	None Required	0.020 mg/L	2021-10-14	
Chlorophyll a	2.04	N/A	0.10 µg/L	2021-10-18	
Nitrogen, Total Kjeldahl	0.244	N/A	0.050 mg/L	2021-10-15	
Phosphorus, Total (as P)	0.0107	N/A	0.0050 mg/L	2021-10-18	
Phosphorus, Total Dissolved	0.0070	N/A	0.0050 mg/L	2021-10-18	

Total Metals

Aluminum, total	0.0114	OG < 0.1	0.0050 mg/L	2021-10-17	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-10-17	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050 mg/L	2021-10-17	
Barium, total	0.0223	MAC = 2	0.0050 mg/L	2021-10-17	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-10-17	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-10-17	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-10-17	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-10-17	
Calcium, total	31.4	None Required	0.20 mg/L	2021-10-17	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-10-17	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-10-17	
Copper, total	0.00090	MAC = 2	0.00040 mg/L	2021-10-17	
Iron, total	0.027	AO ≤ 0.3	0.010 mg/L	2021-10-17	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-10-17	
Lithium, total	0.00335	N/A	0.00010 mg/L	2021-10-17	
Magnesium, total	9.56	None Required	0.010 mg/L	2021-10-17	
Manganese, total	0.00452	MAC = 0.12	0.00020 mg/L	2021-10-17	
Molybdenum, total	0.00323	N/A	0.00010 mg/L	2021-10-17	
Nickel, total	0.00044	N/A	0.00040 mg/L	2021-10-17	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-10-17	
Potassium, total	2.60	N/A	0.10 mg/L	2021-10-17	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-10-17	
Silicon, total	2.8	N/A	1.0 mg/L	2021-10-17	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-10-17	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
2021-10-18 16:20

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10 m composite (21J1096-01) Matrix: Water Sampled: 2021-10-07 10:00, Continued					
<i>Total Metals, Continued</i>					
Sodium, total	12.6	AO ≤ 200	0.10 mg/L	2021-10-17	
Strontium, total	0.280	7	0.0010 mg/L	2021-10-17	
Sulfur, total	11.8	N/A	3.0 mg/L	2021-10-17	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-10-17	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-10-17	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-10-17	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-10-17	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-10-17	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-10-17	
Uranium, total	0.00223	MAC = 0.02	0.000020 mg/L	2021-10-17	
Vanadium, total	0.0018	N/A	0.0010 mg/L	2021-10-17	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-10-17	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-10-17	

Vaseux 20, 22, 24 m composite (21J1096-02) | Matrix: Water | Sampled: 2021-10-07 10:30

Anions

Chloride	6.01	AO ≤ 250	0.10 mg/L	2021-10-12	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-10-12	HT1
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-10-12	HT1
Phosphate (as P)	0.0416	N/A	0.0050 mg/L	2021-10-12	HT1
Sulfate	24.1	AO ≤ 500	1.0 mg/L	2021-10-12	

Calculated Parameters

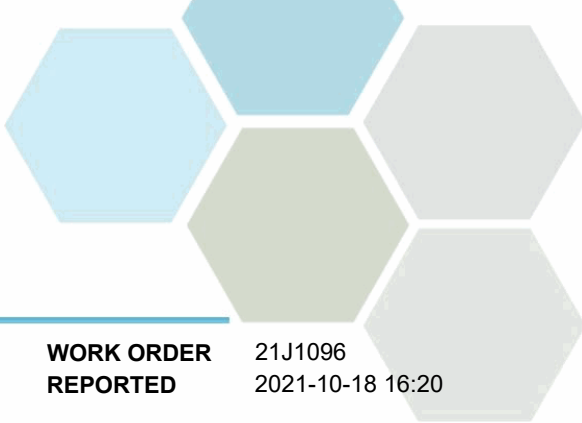
Hardness, Total (as CaCO ₃)	117	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.512	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.185	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.327	None Required	0.020 mg/L	2021-10-14	
Chlorophyll a	< 1.00	N/A	0.10 µg/L	2021-10-18	
Nitrogen, Total Kjeldahl	0.512	N/A	0.050 mg/L	2021-10-15	
Phosphorus, Total (as P)	0.192	N/A	0.0050 mg/L	2021-10-18	
Phosphorus, Total Dissolved	0.161	N/A	0.0050 mg/L	2021-10-18	

Total Metals

Aluminum, total	0.0553	OG < 0.1	0.0050 mg/L	2021-10-16	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-10-16	
Arsenic, total	0.00076	MAC = 0.01	0.00050 mg/L	2021-10-16	
Barium, total	0.0237	MAC = 2	0.0050 mg/L	2021-10-16	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-10-16	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-10-16	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-10-16	



TEST RESULTS

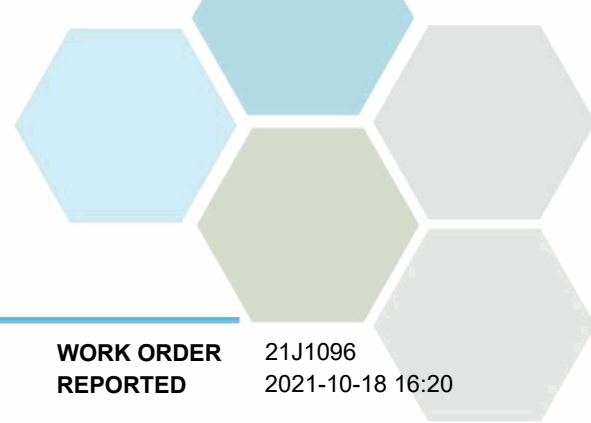
REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
2021-10-18 16:20

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Vaseux 20, 22, 24 m composite (21J1096-02) Matrix: Water Sampled: 2021-10-07 10:30, Continued						
<i>Total Metals, Continued</i>						
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-10-16	
Calcium, total	32.0	None Required	0.20	mg/L	2021-10-16	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-10-16	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-10-16	
Copper, total	0.00041	MAC = 2	0.00040	mg/L	2021-10-16	
Iron, total	0.875	AO ≤ 0.3	0.010	mg/L	2021-10-16	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-10-16	
Lithium, total	0.00303	N/A	0.00010	mg/L	2021-10-16	
Magnesium, total	9.01	None Required	0.010	mg/L	2021-10-16	
Manganese, total	0.588	MAC = 0.12	0.00020	mg/L	2021-10-16	
Molybdenum, total	0.00282	N/A	0.00010	mg/L	2021-10-16	
Nickel, total	0.00068	N/A	0.00040	mg/L	2021-10-16	
Phosphorus, total	0.235	N/A	0.050	mg/L	2021-10-16	
Potassium, total	2.42	N/A	0.10	mg/L	2021-10-16	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-10-16	
Silicon, total	5.4	N/A	1.0	mg/L	2021-10-16	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-10-16	
Sodium, total	16.4	AO ≤ 200	0.10	mg/L	2021-10-16	
Strontium, total	0.300	7	0.0010	mg/L	2021-10-16	
Sulfur, total	7.3	N/A	3.0	mg/L	2021-10-16	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-10-16	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-10-16	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-10-16	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-10-16	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-10-16	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-10-16	
Uranium, total	0.00156	MAC = 0.02	0.000020	mg/L	2021-10-16	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2021-10-16	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2021-10-16	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-10-16	

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
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Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

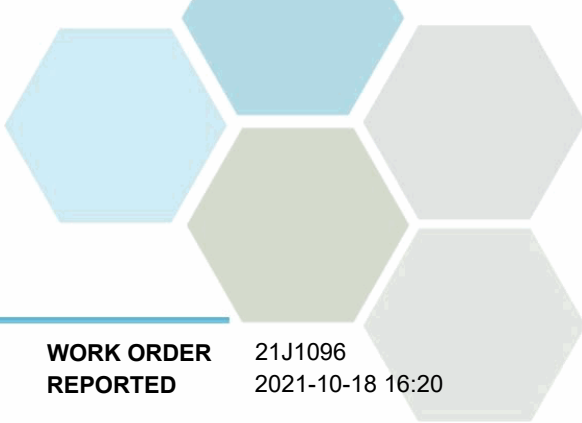
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

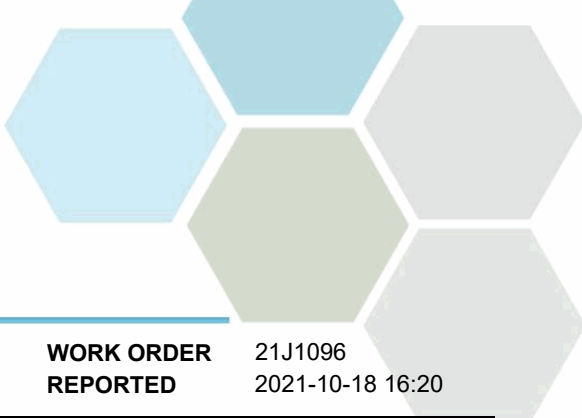
WORK ORDER REPORTED 21J1096
2021-10-18 16:20

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

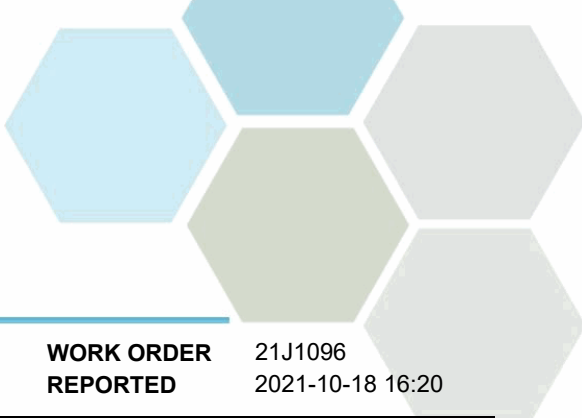
WORK ORDER REPORTED 21J1096
2021-10-18 16:20

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 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
Anions, Batch B1J1016									
Blank (B1J1016-BLK1)			Prepared: 2021-10-12, Analyzed: 2021-10-12						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
Blank (B1J1016-BLK2)			Prepared: 2021-10-12, Analyzed: 2021-10-12						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
Blank (B1J1016-BLK3)			Prepared: 2021-10-12, Analyzed: 2021-10-12						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							
LCS (B1J1016-BS1)			Prepared: 2021-10-12, Analyzed: 2021-10-12						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	4.06	0.010 mg/L	4.00		101	90-110			
Nitrite (as N)	2.01	0.010 mg/L	2.00		100	85-115			
Phosphate (as P)	0.994	0.0050 mg/L	1.00		99	80-120			
Sulfate	16.3	1.0 mg/L	16.0		102	90-110			
LCS (B1J1016-BS2)			Prepared: 2021-10-12, Analyzed: 2021-10-12						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	4.00	0.010 mg/L	4.00		100	90-110			
Nitrite (as N)	1.99	0.010 mg/L	2.00		100	85-115			
Phosphate (as P)	0.967	0.0050 mg/L	1.00		97	80-120			
Sulfate	16.1	1.0 mg/L	16.0		101	90-110			
LCS (B1J1016-BS3)			Prepared: 2021-10-12, Analyzed: 2021-10-12						
Chloride	15.9	0.10 mg/L	16.0		99	90-110			
Nitrate (as N)	4.06	0.010 mg/L	4.00		102	90-110			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls (Vaseux Lake) via LAC	WORK ORDER REPORTED	21J1096 2021-10-18 16:20
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B1J1016, Continued									
LCS (B1J1016-BS3), Continued				Prepared: 2021-10-12, Analyzed: 2021-10-12					
Nitrite (as N)	2.01	0.010 mg/L	2.00		100	85-115			
Phosphate (as P)	1.01	0.0050 mg/L	1.00		101	80-120			
Sulfate	16.0	1.0 mg/L	16.0		100	90-110			

General Parameters, Batch B1J1083

Blank (B1J1083-BLK1)				Prepared: 2021-10-15, Analyzed: 2021-10-18					
Chlorophyll a	< 0.10	0.10 µg/L							

General Parameters, Batch B1J1369

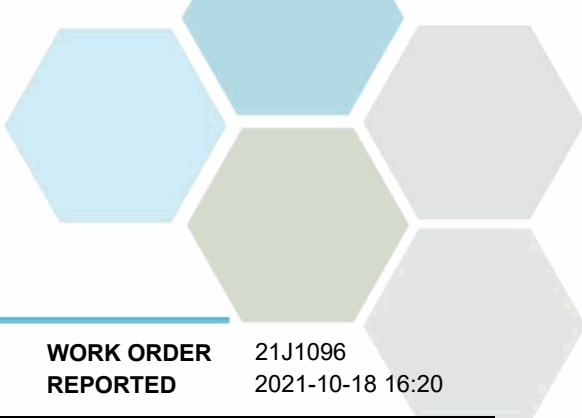
Blank (B1J1369-BLK1)				Prepared: 2021-10-13, Analyzed: 2021-10-15					
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B1J1369-BLK2)				Prepared: 2021-10-13, Analyzed: 2021-10-15					
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1J1369-BS1)				Prepared: 2021-10-13, Analyzed: 2021-10-15					
Nitrogen, Total Kjeldahl	0.981	0.050 mg/L	1.00		98	85-115			
LCS (B1J1369-BS2)				Prepared: 2021-10-13, Analyzed: 2021-10-15					
Nitrogen, Total Kjeldahl	0.979	0.050 mg/L	1.00		98	85-115			
Duplicate (B1J1369-DUP1)				Source: 21J1096-02		Prepared: 2021-10-13, Analyzed: 2021-10-15			
Nitrogen, Total Kjeldahl	0.492	0.050 mg/L		0.512			4	15	
Matrix Spike (B1J1369-MS1)				Source: 21J1096-02		Prepared: 2021-10-13, Analyzed: 2021-10-15			
Nitrogen, Total Kjeldahl	2.31	0.100 mg/L	2.00	0.512	90	65-135			

General Parameters, Batch B1J1378

Blank (B1J1378-BLK1)				Prepared: 2021-10-14, Analyzed: 2021-10-14					
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1J1378-BLK2)				Prepared: 2021-10-14, Analyzed: 2021-10-14					
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
Blank (B1J1378-BLK3)				Prepared: 2021-10-14, Analyzed: 2021-10-14					
Ammonia, Total (as N)	0.021	0.020 mg/L							
LCS (B1J1378-BS1)				Prepared: 2021-10-14, Analyzed: 2021-10-14					
Ammonia, Total (as N)	1.02	0.020 mg/L	1.00		102	90-115			
LCS (B1J1378-BS2)				Prepared: 2021-10-14, Analyzed: 2021-10-14					
Ammonia, Total (as N)	1.02	0.020 mg/L	1.00		102	90-115			
LCS (B1J1378-BS3)				Prepared: 2021-10-14, Analyzed: 2021-10-14					
Ammonia, Total (as N)	1.04	0.020 mg/L	1.00		104	90-115			

General Parameters, Batch B1J1789

Blank (B1J1789-BLK1)				Prepared: 2021-10-18, Analyzed: 2021-10-18					
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Blank (B1J1789-BLK2)				Prepared: 2021-10-18, Analyzed: 2021-10-18					
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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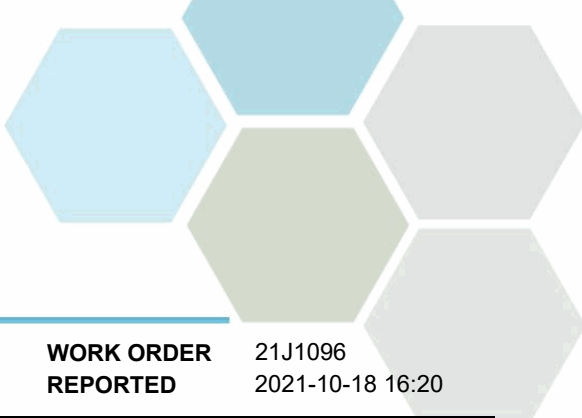
General Parameters, Batch B1J1789, Continued

Blank (B1J1789-BLK3)			Prepared: 2021-10-18, Analyzed: 2021-10-18						
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
LCS (B1J1789-BS1)			Prepared: 2021-10-18, Analyzed: 2021-10-18						
Phosphorus, Total (as P)	0.111	0.0050 mg/L	0.100		111	85-115			
LCS (B1J1789-BS2)			Prepared: 2021-10-18, Analyzed: 2021-10-18						
Phosphorus, Total (as P)	0.112	0.0050 mg/L	0.100		112	85-115			
LCS (B1J1789-BS3)			Prepared: 2021-10-18, Analyzed: 2021-10-18						
Phosphorus, Total Dissolved	0.112	0.0050 mg/L	0.100		112	85-115			

Total Metals, Batch B1J1467

Blank (B1J1467-BLK1)			Prepared: 2021-10-14, Analyzed: 2021-10-17						
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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							

Blank (B1J1467-BLK2)			Prepared: 2021-10-14, Analyzed: 2021-10-17						
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
2021-10-18 16:20

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1J1467, Continued

Blank (B1J1467-BLK2), Continued

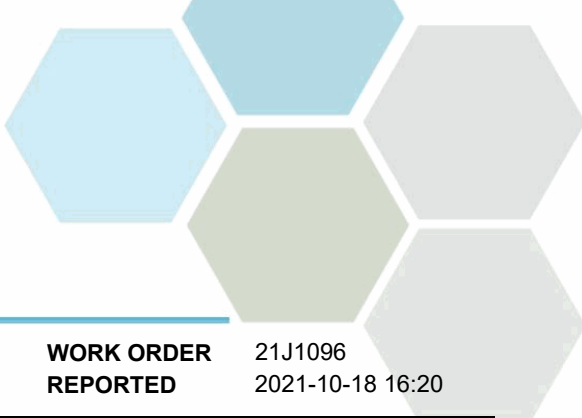
Prepared: 2021-10-14, Analyzed: 2021-10-17

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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B1J1467-BS1)

Prepared: 2021-10-14, Analyzed: 2021-10-17

Aluminum, total	0.0231	0.0050 mg/L	0.0200		116	80-120			
Antimony, total	0.0201	0.00020 mg/L	0.0200		100	80-120			
Arsenic, total	0.0204	0.00050 mg/L	0.0200		102	80-120			
Barium, total	0.0189	0.0050 mg/L	0.0200		94	80-120			
Beryllium, total	0.0187	0.00010 mg/L	0.0200		94	80-120			
Bismuth, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		107	80-120			
Cadmium, total	0.0193	0.000010 mg/L	0.0200		97	80-120			
Calcium, total	2.07	0.20 mg/L	2.00		103	80-120			
Chromium, total	0.0201	0.00050 mg/L	0.0200		100	80-120			
Cobalt, total	0.0200	0.00010 mg/L	0.0200		100	80-120			
Copper, total	0.0199	0.00040 mg/L	0.0200		100	80-120			
Iron, total	2.03	0.010 mg/L	2.00		101	80-120			
Lead, total	0.0192	0.00020 mg/L	0.0200		96	80-120			
Lithium, total	0.0192	0.00010 mg/L	0.0200		96	80-120			
Magnesium, total	2.04	0.010 mg/L	2.00		102	80-120			
Manganese, total	0.0198	0.00020 mg/L	0.0200		99	80-120			
Molybdenum, total	0.0186	0.00010 mg/L	0.0200		93	80-120			
Nickel, total	0.0203	0.00040 mg/L	0.0200		102	80-120			
Phosphorus, total	2.06	0.050 mg/L	2.00		103	80-120			

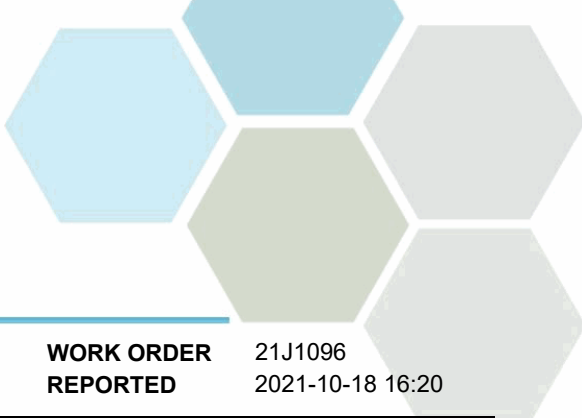


APPENDIX 2: QUALITY CONTROL RESULTS

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OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1J1467, Continued									
LCS (B1J1467-BS1), Continued					Prepared: 2021-10-14, Analyzed: 2021-10-17				
Potassium, total	1.99	0.10 mg/L	2.00		100	80-120			
Selenium, total	0.0207	0.00050 mg/L	0.0200		103	80-120			
Silicon, total	1.8	1.0 mg/L	2.00		91	80-120			
Silver, total	0.0188	0.000050 mg/L	0.0200		94	80-120			
Sodium, total	2.03	0.10 mg/L	2.00		101	80-120			
Strontium, total	0.0192	0.0010 mg/L	0.0200		96	80-120			
Sulfur, total	5.0	3.0 mg/L	5.00		101	80-120			
Tellurium, total	0.0208	0.00050 mg/L	0.0200		104	80-120			
Thallium, total	0.0199	0.000020 mg/L	0.0200		100	80-120			
Thorium, total	0.0184	0.00010 mg/L	0.0200		92	80-120			
Tin, total	0.0207	0.00020 mg/L	0.0200		103	80-120			
Titanium, total	0.0227	0.0050 mg/L	0.0200		114	80-120			
Tungsten, total	0.0190	0.0010 mg/L	0.0200		95	80-120			
Uranium, total	0.0190	0.000020 mg/L	0.0200		95	80-120			
Vanadium, total	0.0236	0.0010 mg/L	0.0200		118	80-120			
Zinc, total	0.0222	0.0040 mg/L	0.0200		111	80-120			
Zirconium, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
LCS (B1J1467-BS2)					Prepared: 2021-10-18, Analyzed: 2021-10-18				
Aluminum, total	0.0230	0.0050 mg/L	0.0200		115	80-120			
Antimony, total	0.0185	0.00020 mg/L	0.0200		92	80-120			
Arsenic, total	0.0167	0.00050 mg/L	0.0200		83	80-120			
Barium, total	0.0180	0.0050 mg/L	0.0200		90	80-120			
Beryllium, total	0.0179	0.00010 mg/L	0.0200		89	80-120			
Bismuth, total	0.0180	0.00010 mg/L	0.0200		90	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		86	80-120			
Cadmium, total	0.0167	0.000010 mg/L	0.0200		84	80-120			
Calcium, total	1.85	0.20 mg/L	2.00		93	80-120			
Chromium, total	0.0175	0.00050 mg/L	0.0200		87	80-120			
Cobalt, total	0.0169	0.00010 mg/L	0.0200		84	80-120			
Copper, total	0.0158	0.00040 mg/L	0.0200		79	80-120			
Iron, total	1.62	0.010 mg/L	2.00		81	80-120			
Lead, total	0.0189	0.00020 mg/L	0.0200		94	80-120			
Lithium, total	0.0173	0.00010 mg/L	0.0200		86	80-120			
Magnesium, total	1.83	0.010 mg/L	2.00		91	80-120			
Manganese, total	0.0170	0.00020 mg/L	0.0200		85	80-120			
Molybdenum, total	0.0177	0.00010 mg/L	0.0200		88	80-120			
Nickel, total	0.0171	0.00040 mg/L	0.0200		85	80-120			
Phosphorus, total	1.75	0.050 mg/L	2.00		88	80-120			
Potassium, total	1.79	0.10 mg/L	2.00		90	80-120			
Selenium, total	0.0178	0.00050 mg/L	0.0200		89	80-120			
Silicon, total	1.8	1.0 mg/L	2.00		88	80-120			
Silver, total	0.0163	0.000050 mg/L	0.0200		82	80-120			
Sodium, total	1.77	0.10 mg/L	2.00		89	80-120			
Strontium, total	0.0179	0.0010 mg/L	0.0200		90	80-120			
Sulfur, total	3.4	3.0 mg/L	5.00		68	80-120			
Tellurium, total	0.0189	0.00050 mg/L	0.0200		95	80-120			
Thallium, total	0.0172	0.000020 mg/L	0.0200		86	80-120			
Thorium, total	0.0177	0.00010 mg/L	0.0200		89	80-120			
Tin, total	0.0192	0.00020 mg/L	0.0200		96	80-120			
Titanium, total	0.0207	0.0050 mg/L	0.0200		103	80-120			
Tungsten, total	0.0197	0.0010 mg/L	0.0200		98	80-120			
Uranium, total	0.0179	0.000020 mg/L	0.0200		90	80-120			
Vanadium, total	0.0200	0.0010 mg/L	0.0200		100	80-120			
Zinc, total	0.0167	0.0040 mg/L	0.0200		83	80-120			
Zirconium, total	0.0189	0.00010 mg/L	0.0200		94	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

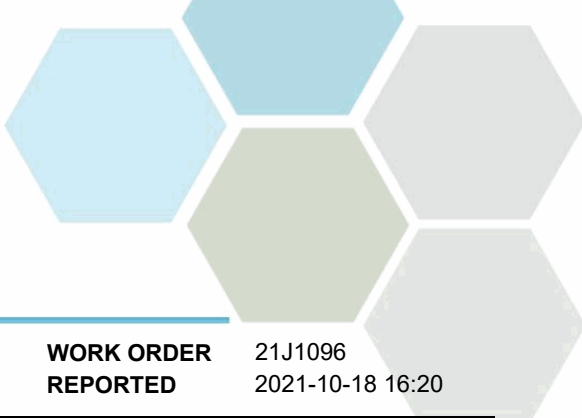
WORK ORDER REPORTED 21J1096
2021-10-18 16:20

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1J1467, Continued

Reference (B1J1467-SRM1)	Prepared: 2021-10-14, Analyzed: 2021-10-17								
Aluminum, total	0.317	0.0050 mg/L	0.299		106	70-130			
Antimony, total	0.0500	0.00020 mg/L	0.0517		97	70-130			
Arsenic, total	0.125	0.00050 mg/L	0.119		105	70-130			
Barium, total	0.693	0.0050 mg/L	0.801		86	70-130			
Beryllium, total	0.0464	0.00010 mg/L	0.0501		93	70-130			
Boron, total	3.56	0.0500 mg/L	4.11		87	70-130			
Cadmium, total	0.0486	0.000010 mg/L	0.0503		97	70-130			
Calcium, total	10.2	0.20 mg/L	10.7		96	70-130			
Chromium, total	0.254	0.00050 mg/L	0.250		102	70-130			
Cobalt, total	0.0393	0.00010 mg/L	0.0384		102	70-130			
Copper, total	0.480	0.00040 mg/L	0.487		99	70-130			
Iron, total	0.512	0.010 mg/L	0.504		102	70-130			
Lead, total	0.269	0.00020 mg/L	0.278		97	70-130			
Lithium, total	0.387	0.00010 mg/L	0.398		97	70-130			
Magnesium, total	3.90	0.010 mg/L	3.59		109	70-130			
Manganese, total	0.109	0.00020 mg/L	0.111		99	70-130			
Molybdenum, total	0.194	0.00010 mg/L	0.196		99	70-130			
Nickel, total	0.252	0.00040 mg/L	0.248		101	70-130			
Phosphorus, total	0.255	0.050 mg/L	0.213		120	70-130			
Potassium, total	6.29	0.10 mg/L	5.89		107	70-130			
Selenium, total	0.127	0.00050 mg/L	0.120		105	70-130			
Sodium, total	9.68	0.10 mg/L	8.71		111	70-130			
Strontium, total	0.386	0.0010 mg/L	0.393		98	70-130			
Thallium, total	0.0784	0.000020 mg/L	0.0787		100	70-130			
Uranium, total	0.0324	0.000020 mg/L	0.0344		94	70-130			
Vanadium, total	0.411	0.0010 mg/L	0.391		105	70-130			
Zinc, total	2.67	0.0040 mg/L	2.50		107	70-130			

Reference (B1J1467-SRM2)	Prepared: 2021-10-14, Analyzed: 2021-10-17								
Aluminum, total	0.320	0.0050 mg/L	0.299		107	70-130			
Antimony, total	0.0508	0.00020 mg/L	0.0517		98	70-130			
Arsenic, total	0.125	0.00050 mg/L	0.119		105	70-130			
Barium, total	0.692	0.0050 mg/L	0.801		86	70-130			
Beryllium, total	0.0482	0.00010 mg/L	0.0501		96	70-130			
Boron, total	3.84	0.0500 mg/L	4.11		93	70-130			
Cadmium, total	0.0489	0.000010 mg/L	0.0503		97	70-130			
Calcium, total	10.6	0.20 mg/L	10.7		99	70-130			
Chromium, total	0.255	0.00050 mg/L	0.250		102	70-130			
Cobalt, total	0.0393	0.00010 mg/L	0.0384		102	70-130			
Copper, total	0.479	0.00040 mg/L	0.487		98	70-130			
Iron, total	0.511	0.010 mg/L	0.504		101	70-130			
Lead, total	0.277	0.00020 mg/L	0.278		100	70-130			
Lithium, total	0.408	0.00010 mg/L	0.398		102	70-130			
Magnesium, total	3.98	0.010 mg/L	3.59		111	70-130			
Manganese, total	0.113	0.00020 mg/L	0.111		102	70-130			
Molybdenum, total	0.195	0.00010 mg/L	0.196		99	70-130			
Nickel, total	0.253	0.00040 mg/L	0.248		102	70-130			
Phosphorus, total	0.251	0.050 mg/L	0.213		118	70-130			
Potassium, total	6.42	0.10 mg/L	5.89		109	70-130			
Selenium, total	0.126	0.00050 mg/L	0.120		105	70-130			
Sodium, total	9.89	0.10 mg/L	8.71		114	70-130			
Strontium, total	0.398	0.0010 mg/L	0.393		101	70-130			
Thallium, total	0.0809	0.000020 mg/L	0.0787		103	70-130			
Uranium, total	0.0333	0.000020 mg/L	0.0344		97	70-130			
Vanadium, total	0.410	0.0010 mg/L	0.391		105	70-130			
Zinc, total	2.66	0.0040 mg/L	2.50		106	70-130			



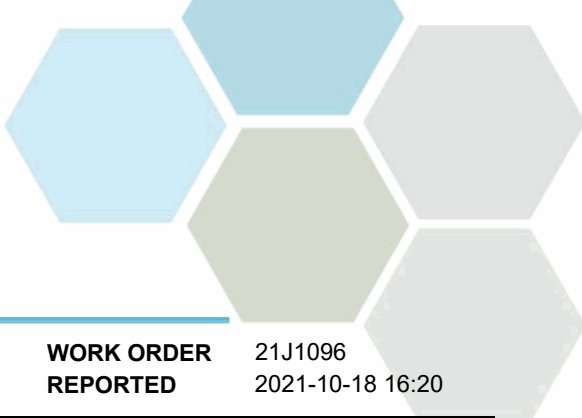
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
2021-10-18 16:20

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1J1501									
Blank (B1J1501-BLK1)					Prepared: 2021-10-14, Analyzed: 2021-10-16				
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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B1J1501-BS1)					Prepared: 2021-10-14, Analyzed: 2021-10-16				
Aluminum, total	0.0182	0.0050 mg/L	0.0200		91	80-120			
Antimony, total	0.0198	0.00020 mg/L	0.0200		99	80-120			
Arsenic, total	0.0186	0.00050 mg/L	0.0200		93	80-120			
Barium, total	0.0177	0.0050 mg/L	0.0200		88	80-120			
Beryllium, total	0.0195	0.00010 mg/L	0.0200		97	80-120			
Bismuth, total	0.0199	0.00010 mg/L	0.0200		99	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		81	80-120			
Cadmium, total	0.0189	0.000010 mg/L	0.0200		94	80-120			
Calcium, total	2.17	0.20 mg/L	2.00		109	80-120			
Chromium, total	0.0188	0.00050 mg/L	0.0200		94	80-120			
Cobalt, total	0.0190	0.00010 mg/L	0.0200		95	80-120			
Copper, total	0.0186	0.00040 mg/L	0.0200		93	80-120			
Iron, total	1.79	0.010 mg/L	2.00		90	80-120			
Lead, total	0.0200	0.00020 mg/L	0.0200		100	80-120			
Lithium, total	0.0188	0.00010 mg/L	0.0200		94	80-120			
Magnesium, total	1.99	0.010 mg/L	2.00		100	80-120			
Manganese, total	0.0179	0.00020 mg/L	0.0200		89	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21J1096
2021-10-18 16:20

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1J1501, Continued									
LCS (B1J1501-BS1), Continued					Prepared: 2021-10-14, Analyzed: 2021-10-16				
Molybdenum, total	0.0193	0.00010 mg/L	0.0200		97	80-120			
Nickel, total	0.0195	0.00040 mg/L	0.0200		98	80-120			
Phosphorus, total	1.95	0.050 mg/L	2.00		98	80-120			
Potassium, total	1.91	0.10 mg/L	2.00		96	80-120			
Selenium, total	0.0216	0.00050 mg/L	0.0200		108	80-120			
Silicon, total	2.1	1.0 mg/L	2.00		104	80-120			
Silver, total	0.0189	0.000050 mg/L	0.0200		95	80-120			
Sodium, total	1.99	0.10 mg/L	2.00		100	80-120			
Strontium, total	0.0176	0.0010 mg/L	0.0200		88	80-120			
Sulfur, total	4.2	3.0 mg/L	5.00		85	80-120			
Tellurium, total	0.0195	0.00050 mg/L	0.0200		98	80-120			
Thallium, total	0.0186	0.000020 mg/L	0.0200		93	80-120			
Thorium, total	0.0190	0.00010 mg/L	0.0200		95	80-120			
Tin, total	0.0207	0.00020 mg/L	0.0200		103	80-120			
Titanium, total	0.0213	0.0050 mg/L	0.0200		107	80-120			
Tungsten, total	0.0196	0.0010 mg/L	0.0200		98	80-120			
Uranium, total	0.0194	0.000020 mg/L	0.0200		97	80-120			
Vanadium, total	0.0194	0.0010 mg/L	0.0200		97	80-120			
Zinc, total	0.0201	0.0040 mg/L	0.0200		101	80-120			
Zirconium, total	0.0206	0.00010 mg/L	0.0200		103	80-120			
Reference (B1J1501-SRM1)					Prepared: 2021-10-14, Analyzed: 2021-10-16				
Aluminum, total	0.286	0.0050 mg/L	0.299		96	70-130			
Antimony, total	0.0450	0.00020 mg/L	0.0517		87	70-130			
Arsenic, total	0.116	0.00050 mg/L	0.119		98	70-130			
Barium, total	0.588	0.0050 mg/L	0.801		73	70-130			
Beryllium, total	0.0443	0.00010 mg/L	0.0501		88	70-130			
Boron, total	3.06	0.0500 mg/L	4.11		75	70-130			
Cadmium, total	0.0450	0.000010 mg/L	0.0503		89	70-130			
Calcium, total	13.3	0.20 mg/L	10.7		124	70-130			
Chromium, total	0.241	0.00050 mg/L	0.250		97	70-130			
Cobalt, total	0.0356	0.00010 mg/L	0.0384		93	70-130			
Copper, total	0.466	0.00040 mg/L	0.487		96	70-130			
Iron, total	0.508	0.010 mg/L	0.504		101	70-130			
Lead, total	0.282	0.00020 mg/L	0.278		102	70-130			
Lithium, total	0.368	0.00010 mg/L	0.398		92	70-130			
Magnesium, total	3.36	0.010 mg/L	3.59		94	70-130			
Manganese, total	0.105	0.00020 mg/L	0.111		95	70-130			
Molybdenum, total	0.179	0.00010 mg/L	0.196		92	70-130			
Nickel, total	0.243	0.00040 mg/L	0.248		98	70-130			
Phosphorus, total	0.263	0.050 mg/L	0.213		123	70-130			
Potassium, total	5.16	0.10 mg/L	5.89		88	70-130			
Selenium, total	0.109	0.00050 mg/L	0.120		91	70-130			
Sodium, total	10.2	0.10 mg/L	8.71		117	70-130			
Strontium, total	0.350	0.0010 mg/L	0.393		89	70-130			
Thallium, total	0.0669	0.000020 mg/L	0.0787		85	70-130			
Uranium, total	0.0284	0.000020 mg/L	0.0344		83	70-130			
Vanadium, total	0.370	0.0010 mg/L	0.391		95	70-130			
Zinc, total	2.47	0.0040 mg/L	2.50		99	70-130			



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Okanagan Similkameen 101 Martin Street Penticton, BC V2A 5J9	WORK ORDER	21K0702
ATTENTION	Rina Seppen	RECEIVED / TEMP REPORTED	2021-11-04 13:45 / 8.3°C 2021-11-12 13:14
PO NUMBER	OK Falls (Vaseux Lake) via LAC	COC NUMBER	44174.36895
PROJECT	OK Falls (Vaseux Lake) via LAC		
PROJECT INFO			

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.

Work Order Comments:

Custody Seals Intact: N/A

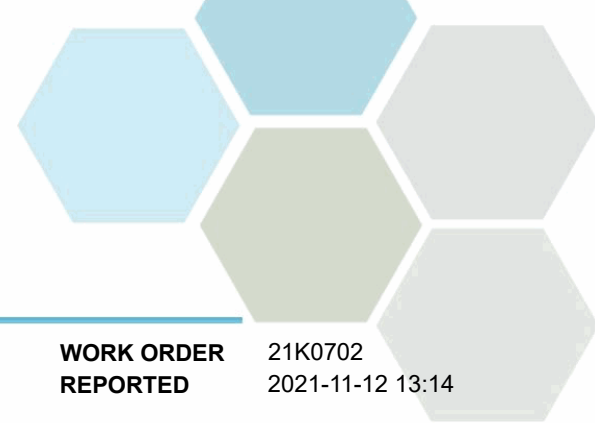
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21K0702
2021-11-12 13:14

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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Vaseux 1, 5, 10 m composite (21K0702-01) | Matrix: Water | Sampled: 2021-11-04 10:00

Anions

Chloride	5.91	AO ≤ 250	0.10 mg/L	2021-11-06	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-11-06	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-11-06	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-11-06	
Sulfate	28.8	AO ≤ 500	1.0 mg/L	2021-11-06	

Calculated Parameters

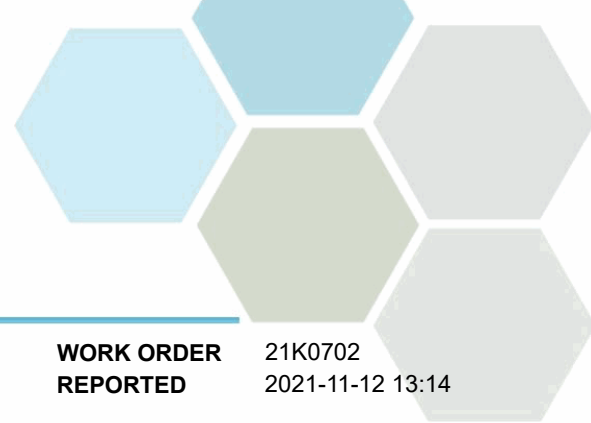
Hardness, Total (as CaCO3)	134	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.199	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.173	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.026	None Required	0.020 mg/L	2021-11-05	
Chlorophyll a	2.44	N/A	0.10 µg/L	2021-11-09	
Nitrogen, Total Kjeldahl	0.199	N/A	0.050 mg/L	2021-11-10	
Phosphorus, Total (as P)	0.0227	N/A	0.0050 mg/L	2021-11-09	
Phosphorus, Total Dissolved	0.0173	N/A	0.0050 mg/L	2021-11-09	

Total Metals

Aluminum, total	0.0203	OG < 0.1	0.0050 mg/L	2021-11-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-11-11	
Arsenic, total	0.00050	MAC = 0.01	0.00050 mg/L	2021-11-11	
Barium, total	0.0250	MAC = 2	0.0050 mg/L	2021-11-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-11-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-11-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-11-11	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2021-11-11	
Calcium, total	37.1	None Required	0.20 mg/L	2021-11-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-11-11	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2021-11-11	
Copper, total	0.00114	MAC = 2	0.00040 mg/L	2021-11-11	
Iron, total	0.038	AO ≤ 0.3	0.010 mg/L	2021-11-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2021-11-11	
Lithium, total	0.00364	N/A	0.00010 mg/L	2021-11-11	
Magnesium, total	10.1	None Required	0.010 mg/L	2021-11-11	
Manganese, total	0.0295	MAC = 0.12	0.00020 mg/L	2021-11-11	
Molybdenum, total	0.00336	N/A	0.00010 mg/L	2021-11-11	
Nickel, total	0.00047	N/A	0.00040 mg/L	2021-11-11	
Phosphorus, total	< 0.050	N/A	0.050 mg/L	2021-11-11	
Potassium, total	2.63	N/A	0.10 mg/L	2021-11-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2021-11-11	
Silicon, total	3.6	N/A	1.0 mg/L	2021-11-11	
Silver, total	< 0.000050	None Required	0.000050 mg/L	2021-11-11	



TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Vaseux 1, 5, 10 m composite (21K0702-01) Matrix: Water Sampled: 2021-11-04 10:00, Continued					
<i>Total Metals, Continued</i>					
Sodium, total	12.6	AO ≤ 200	0.10 mg/L	2021-11-11	
Strontium, total	0.305	7	0.0010 mg/L	2021-11-11	
Sulfur, total	12.0	N/A	3.0 mg/L	2021-11-11	
Tellurium, total	< 0.00050	N/A	0.00050 mg/L	2021-11-11	
Thallium, total	< 0.000020	N/A	0.000020 mg/L	2021-11-11	
Thorium, total	< 0.00010	N/A	0.00010 mg/L	2021-11-11	
Tin, total	< 0.00020	N/A	0.00020 mg/L	2021-11-11	
Titanium, total	< 0.0050	N/A	0.0050 mg/L	2021-11-11	
Tungsten, total	< 0.0010	N/A	0.0010 mg/L	2021-11-11	
Uranium, total	0.00252	MAC = 0.02	0.000020 mg/L	2021-11-11	
Vanadium, total	0.0013	N/A	0.0010 mg/L	2021-11-11	
Zinc, total	< 0.0040	AO ≤ 5	0.0040 mg/L	2021-11-11	
Zirconium, total	< 0.00010	N/A	0.00010 mg/L	2021-11-11	

Vaseux 20, 22, 24 m composite (21K0702-02) | Matrix: Water | Sampled: 2021-11-04 10:30

Anions

Chloride	5.91	AO ≤ 250	0.10 mg/L	2021-11-06	
Nitrate (as N)	< 0.010	MAC = 10	0.010 mg/L	2021-11-06	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2021-11-06	
Phosphate (as P)	< 0.0050	N/A	0.0050 mg/L	2021-11-06	
Sulfate	28.9	AO ≤ 500	1.0 mg/L	2021-11-06	

Calculated Parameters

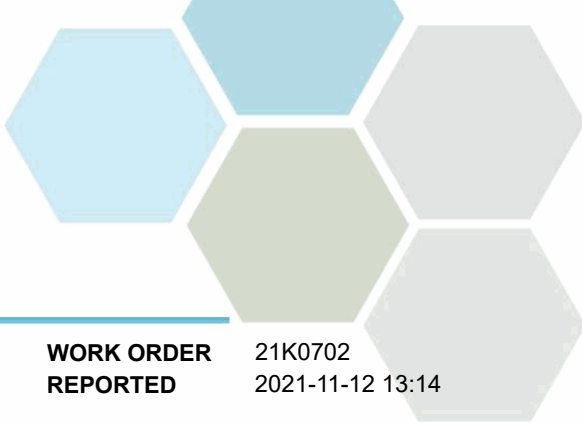
Hardness, Total (as CaCO3)	133	None Required	0.500 mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	0.233	N/A	0.0500 mg/L	N/A	
Nitrogen, Organic	0.192	N/A	0.0500 mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.041	None Required	0.020 mg/L	2021-11-05	
Chlorophyll a	1.37	N/A	0.10 µg/L	2021-11-09	
Nitrogen, Total Kjeldahl	0.233	N/A	0.050 mg/L	2021-11-10	
Phosphorus, Total (as P)	0.0289	N/A	0.0050 mg/L	2021-11-09	
Phosphorus, Total Dissolved	0.0184	N/A	0.0050 mg/L	2021-11-09	

Total Metals

Aluminum, total	0.0424	OG < 0.1	0.0050 mg/L	2021-11-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2021-11-11	
Arsenic, total	0.00061	MAC = 0.01	0.00050 mg/L	2021-11-11	
Barium, total	0.0270	MAC = 2	0.0050 mg/L	2021-11-11	
Beryllium, total	< 0.00010	N/A	0.00010 mg/L	2021-11-11	
Bismuth, total	< 0.00010	N/A	0.00010 mg/L	2021-11-11	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2021-11-11	

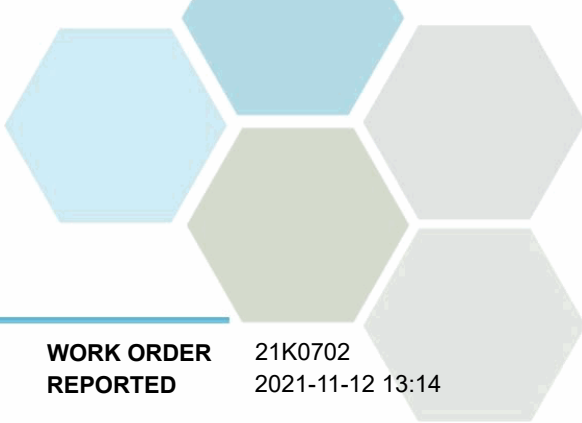


TEST RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21K0702
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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Vaseux 20, 22, 24 m composite (21K0702-02) Matrix: Water Sampled: 2021-11-04 10:30, Continued						
<i>Total Metals, Continued</i>						
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2021-11-11	
Calcium, total	36.9	None Required	0.20	mg/L	2021-11-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-11-11	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2021-11-11	
Copper, total	0.00071	MAC = 2	0.00040	mg/L	2021-11-11	
Iron, total	0.085	AO ≤ 0.3	0.010	mg/L	2021-11-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2021-11-11	
Lithium, total	0.00359	N/A	0.00010	mg/L	2021-11-11	
Magnesium, total	9.92	None Required	0.010	mg/L	2021-11-11	
Manganese, total	0.0530	MAC = 0.12	0.00020	mg/L	2021-11-11	
Molybdenum, total	0.00354	N/A	0.00010	mg/L	2021-11-11	
Nickel, total	0.00105	N/A	0.00040	mg/L	2021-11-11	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2021-11-11	
Potassium, total	2.59	N/A	0.10	mg/L	2021-11-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2021-11-11	
Silicon, total	3.6	N/A	1.0	mg/L	2021-11-11	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2021-11-11	
Sodium, total	12.4	AO ≤ 200	0.10	mg/L	2021-11-11	
Strontium, total	0.299	7	0.0010	mg/L	2021-11-11	
Sulfur, total	10.5	N/A	3.0	mg/L	2021-11-11	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2021-11-11	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2021-11-11	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2021-11-11	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2021-11-11	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2021-11-11	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2021-11-11	
Uranium, total	0.00247	MAC = 0.02	0.000020	mg/L	2021-11-11	
Vanadium, total	0.0019	N/A	0.0010	mg/L	2021-11-11	
Zinc, total	0.0070	AO ≤ 5	0.0040	mg/L	2021-11-11	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2021-11-11	



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Chlorophyll-A in Water	SM 10200 H (2017)	Spectrophotometry		Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

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

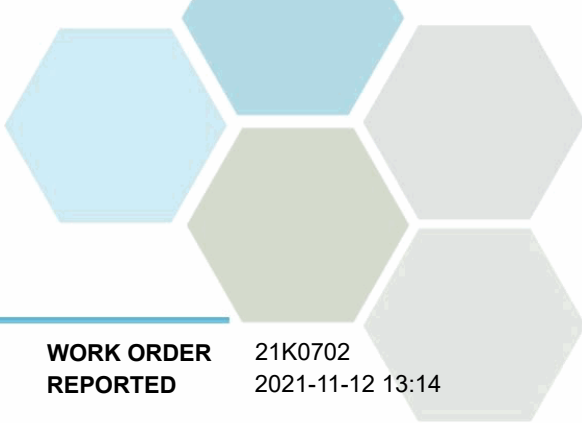
Glossary of Terms:

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
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
OG	Operational Guideline (treated water)
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

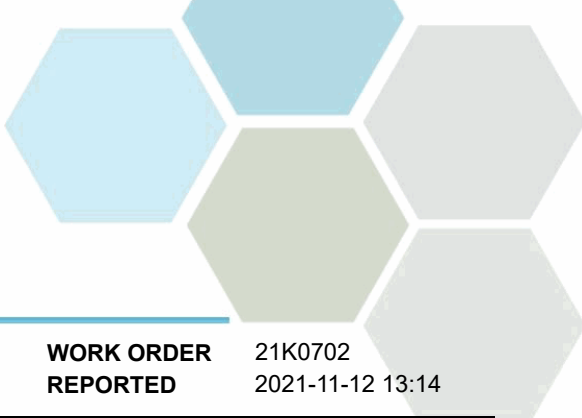
WORK ORDER REPORTED 21K0702
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General Comments:

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.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: bwhitehead@caro.ca

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 PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

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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 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
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Anions, Batch B1K0668

Blank (B1K0668-BLK1)			Prepared: 2021-11-05, Analyzed: 2021-11-05						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							

Blank (B1K0668-BLK2)			Prepared: 2021-11-06, Analyzed: 2021-11-06						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Phosphate (as P)	< 0.0050	0.0050 mg/L							
Sulfate	< 1.0	1.0 mg/L							

LCS (B1K0668-BS1)			Prepared: 2021-11-05, Analyzed: 2021-11-05						
Chloride	15.9	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	4.10	0.010 mg/L	4.00		102	90-110			
Nitrite (as N)	2.04	0.010 mg/L	2.00		102	85-115			
Phosphate (as P)	0.917	0.0050 mg/L	1.00		92	80-120			
Sulfate	16.3	1.0 mg/L	16.0		102	90-110			

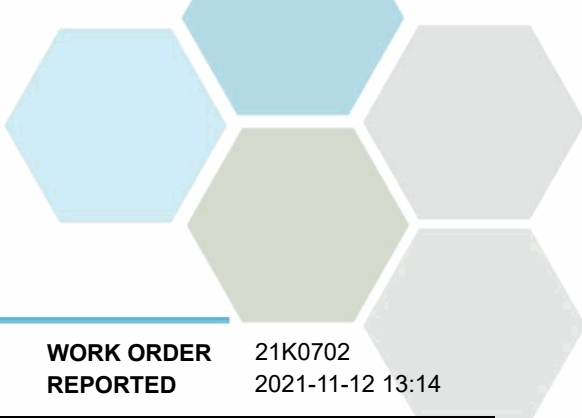
LCS (B1K0668-BS2)			Prepared: 2021-11-06, Analyzed: 2021-11-06						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	4.15	0.010 mg/L	4.00		104	90-110			
Nitrite (as N)	2.06	0.010 mg/L	2.00		103	85-115			
Phosphate (as P)	0.938	0.0050 mg/L	1.00		94	80-120			
Sulfate	16.2	1.0 mg/L	16.0		101	90-110			

General Parameters, Batch B1K0545

Blank (B1K0545-BLK1)			Prepared: 2021-11-03, Analyzed: 2021-11-09						
Chlorophyll a	< 0.10	0.10 µg/L							

General Parameters, Batch B1K0766

Blank (B1K0766-BLK1)			Prepared: 2021-11-05, Analyzed: 2021-11-05						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Regional District of Okanagan Similkameen OK Falls (Vaseux Lake) via LAC	WORK ORDER REPORTED	21K0702 2021-11-12 13:14
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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General Parameters, Batch B1K0766, Continued

Blank (B1K0766-BLK1), Continued			Prepared: 2021-11-05, Analyzed: 2021-11-05						
Blank (B1K0766-BLK2)			Prepared: 2021-11-05, Analyzed: 2021-11-05						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
LCS (B1K0766-BS1)			Prepared: 2021-11-05, Analyzed: 2021-11-05						
Ammonia, Total (as N)	1.01	0.020 mg/L	1.00		101	90-115			
LCS (B1K0766-BS2)			Prepared: 2021-11-05, Analyzed: 2021-11-05						
Ammonia, Total (as N)	0.995	0.020 mg/L	1.00		100	90-115			
Duplicate (B1K0766-DUP2)			Source: 21K0702-01		Prepared: 2021-11-05, Analyzed: 2021-11-05				
Ammonia, Total (as N)	0.024	0.020 mg/L		0.026					15
Matrix Spike (B1K0766-MS2)			Source: 21K0702-01		Prepared: 2021-11-05, Analyzed: 2021-11-05				
Ammonia, Total (as N)	0.295	0.020 mg/L	0.250	0.026	108	75-125			

General Parameters, Batch B1K0996

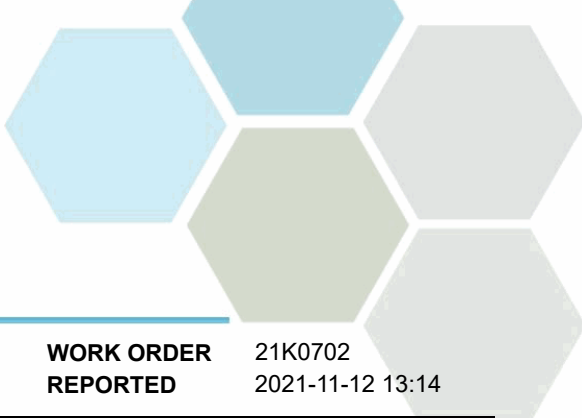
Blank (B1K0996-BLK1)			Prepared: 2021-11-08, Analyzed: 2021-11-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B1K0996-BLK2)			Prepared: 2021-11-08, Analyzed: 2021-11-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1K0996-BS1)			Prepared: 2021-11-08, Analyzed: 2021-11-10						
Nitrogen, Total Kjeldahl	1.02	0.050 mg/L	1.00		102	85-115			
LCS (B1K0996-BS2)			Prepared: 2021-11-08, Analyzed: 2021-11-10						
Nitrogen, Total Kjeldahl	1.03	0.050 mg/L	1.00		103	85-115			
Duplicate (B1K0996-DUP1)			Source: 21K0702-01		Prepared: 2021-11-08, Analyzed: 2021-11-10				
Nitrogen, Total Kjeldahl	0.203	0.050 mg/L		0.199					15
Matrix Spike (B1K0996-MS1)			Source: 21K0702-01		Prepared: 2021-11-08, Analyzed: 2021-11-10				
Nitrogen, Total Kjeldahl	2.22	0.100 mg/L	2.00	0.199	101	65-135			

General Parameters, Batch B1K1036

Blank (B1K1036-BLK1)			Prepared: 2021-11-09, Analyzed: 2021-11-09						
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
Blank (B1K1036-BLK2)			Prepared: 2021-11-09, Analyzed: 2021-11-09						
Phosphorus, Total Dissolved	< 0.0050	0.0050 mg/L							
LCS (B1K1036-BS1)			Prepared: 2021-11-09, Analyzed: 2021-11-09						
Phosphorus, Total (as P)	0.105	0.0050 mg/L	0.100		105	85-115			
Phosphorus, Total Dissolved	0.106	0.0050 mg/L	0.100		106	85-115			
LCS (B1K1036-BS2)			Prepared: 2021-11-09, Analyzed: 2021-11-09						
Phosphorus, Total Dissolved	0.107	0.0050 mg/L	0.100		107	85-115			

Total Metals, Batch B1K1078

Blank (B1K1078-BLK1)			Prepared: 2021-11-09, Analyzed: 2021-11-11						
Aluminum, total	< 0.0050	0.0050 mg/L							



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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1K1078, Continued

Blank (B1K1078-BLK1), Continued

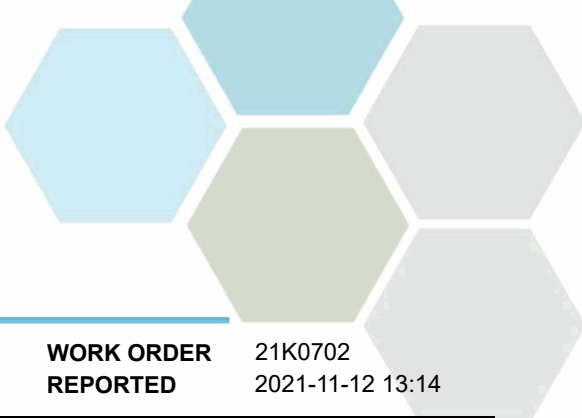
Prepared: 2021-11-09, Analyzed: 2021-11-11

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	< 0.00020	0.00020 mg/L
Titanium, total	< 0.0050	0.0050 mg/L
Tungsten, total	< 0.0010	0.0010 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

Blank (B1K1078-BLK2)

Prepared: 2021-11-09, Analyzed: 2021-11-11

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



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21K0702
2021-11-12 13:14

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1K1078, Continued

Blank (B1K1078-BLK2), Continued

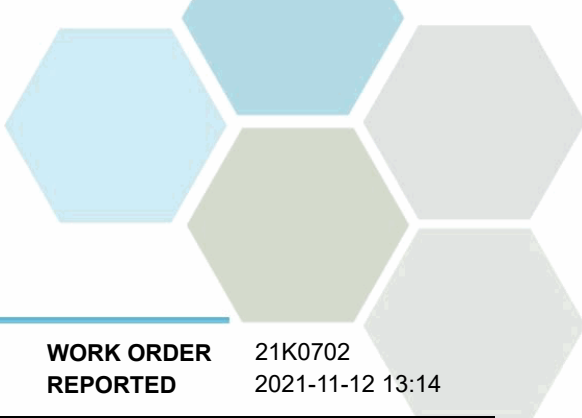
Prepared: 2021-11-09, Analyzed: 2021-11-11

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	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 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 (B1K1078-BS1)

Prepared: 2021-11-09, Analyzed: 2021-11-11

Aluminum, total	0.0219	0.0050 mg/L	0.0200		109	80-120			
Antimony, total	0.0217	0.00020 mg/L	0.0200		108	80-120			
Arsenic, total	0.0206	0.00050 mg/L	0.0200		103	80-120			
Barium, total	0.0196	0.0050 mg/L	0.0200		98	80-120			
Beryllium, total	0.0215	0.00010 mg/L	0.0200		108	80-120			
Bismuth, total	0.0201	0.00010 mg/L	0.0200		101	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		109	80-120			
Cadmium, total	0.0202	0.000010 mg/L	0.0200		101	80-120			
Calcium, total	2.23	0.20 mg/L	2.00		111	80-120			
Chromium, total	0.0200	0.00050 mg/L	0.0200		100	80-120			
Cobalt, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
Copper, total	0.0195	0.00040 mg/L	0.0200		97	80-120			
Iron, total	2.06	0.010 mg/L	2.00		103	80-120			
Lead, total	0.0205	0.00020 mg/L	0.0200		102	80-120			
Lithium, total	0.0211	0.00010 mg/L	0.0200		105	80-120			
Magnesium, total	1.93	0.010 mg/L	2.00		96	80-120			
Manganese, total	0.0194	0.00020 mg/L	0.0200		97	80-120			
Molybdenum, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
Nickel, total	0.0201	0.00040 mg/L	0.0200		101	80-120			
Phosphorus, total	1.96	0.050 mg/L	2.00		98	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	2.2	1.0 mg/L	2.00		109	80-120			
Silver, total	0.0198	0.000050 mg/L	0.0200		99	80-120			
Sodium, total	1.91	0.10 mg/L	2.00		95	80-120			
Strontium, total	0.0192	0.0010 mg/L	0.0200		96	80-120			
Sulfur, total	4.4	3.0 mg/L	5.00		88	80-120			
Tellurium, total	0.0210	0.00050 mg/L	0.0200		105	80-120			
Thallium, total	0.0202	0.000020 mg/L	0.0200		101	80-120			
Thorium, total	0.0193	0.00010 mg/L	0.0200		97	80-120			
Tin, total	0.0210	0.00020 mg/L	0.0200		105	80-120			
Titanium, total	0.0224	0.0050 mg/L	0.0200		112	80-120			
Tungsten, total	0.0199	0.0010 mg/L	0.0200		99	80-120			
Uranium, total	0.0195	0.000020 mg/L	0.0200		97	80-120			
Vanadium, total	0.0216	0.0010 mg/L	0.0200		108	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

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OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21K0702
2021-11-12 13:14

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B1K1078, Continued

LCS (B1K1078-BS1), Continued

Prepared: 2021-11-09, Analyzed: 2021-11-11

Zinc, total	0.0209	0.0040 mg/L	0.0200		104	80-120			
Zirconium, total	0.0208	0.00010 mg/L	0.0200		104	80-120			

LCS (B1K1078-BS2)

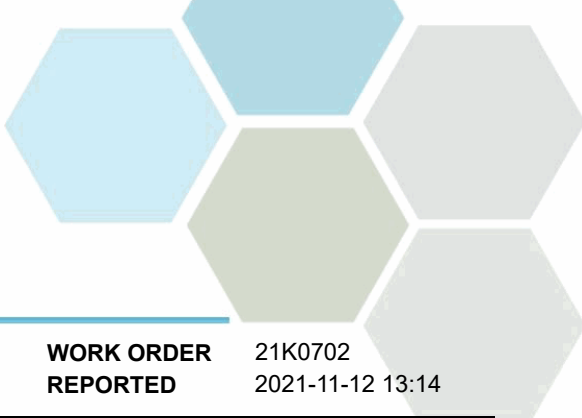
Prepared: 2021-11-09, Analyzed: 2021-11-11

Aluminum, total	0.0240	0.0050 mg/L	0.0200		120	80-120			
Antimony, total	0.0219	0.00020 mg/L	0.0200		110	80-120			
Arsenic, total	0.0204	0.00050 mg/L	0.0200		102	80-120			
Barium, total	0.0200	0.0050 mg/L	0.0200		100	80-120			
Beryllium, total	0.0206	0.00010 mg/L	0.0200		103	80-120			
Bismuth, total	0.0200	0.00010 mg/L	0.0200		100	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		97	80-120			
Cadmium, total	0.0202	0.000010 mg/L	0.0200		101	80-120			
Calcium, total	2.38	0.20 mg/L	2.00		119	80-120			
Chromium, total	0.0201	0.00050 mg/L	0.0200		100	80-120			
Cobalt, total	0.0196	0.00010 mg/L	0.0200		98	80-120			
Copper, total	0.0194	0.00040 mg/L	0.0200		97	80-120			
Iron, total	2.02	0.010 mg/L	2.00		101	80-120			
Lead, total	0.0204	0.00020 mg/L	0.0200		102	80-120			
Lithium, total	0.0204	0.00010 mg/L	0.0200		102	80-120			
Magnesium, total	1.94	0.010 mg/L	2.00		97	80-120			
Manganese, total	0.0197	0.00020 mg/L	0.0200		98	80-120			
Molybdenum, total	0.0197	0.00010 mg/L	0.0200		99	80-120			
Nickel, total	0.0203	0.00040 mg/L	0.0200		101	80-120			
Phosphorus, total	2.05	0.050 mg/L	2.00		103	80-120			
Potassium, total	1.89	0.10 mg/L	2.00		95	80-120			
Selenium, total	0.0205	0.00050 mg/L	0.0200		102	80-120			
Silicon, total	2.2	1.0 mg/L	2.00		110	80-120			
Silver, total	0.0196	0.000050 mg/L	0.0200		98	80-120			
Sodium, total	1.85	0.10 mg/L	2.00		93	80-120			
Strontium, total	0.0199	0.0010 mg/L	0.0200		99	80-120			
Sulfur, total	5.4	3.0 mg/L	5.00		108	80-120			
Tellurium, total	0.0204	0.00050 mg/L	0.0200		102	80-120			
Thallium, total	0.0202	0.000020 mg/L	0.0200		101	80-120			
Thorium, total	0.0194	0.00010 mg/L	0.0200		97	80-120			
Tin, total	0.0213	0.00020 mg/L	0.0200		107	80-120			
Titanium, total	0.0207	0.0050 mg/L	0.0200		103	80-120			
Tungsten, total	0.0199	0.0010 mg/L	0.0200		100	80-120			
Uranium, total	0.0195	0.000020 mg/L	0.0200		98	80-120			
Vanadium, total	0.0216	0.0010 mg/L	0.0200		108	80-120			
Zinc, total	0.0212	0.0040 mg/L	0.0200		106	80-120			
Zirconium, total	0.0206	0.00010 mg/L	0.0200		103	80-120			

Reference (B1K1078-SRM1)

Prepared: 2021-11-09, Analyzed: 2021-11-11

Aluminum, total	0.213	0.0050 mg/L	0.198		107	70-130			
Antimony, total	0.0253	0.00020 mg/L	0.0230		110	70-130			
Arsenic, total	0.0208	0.00050 mg/L	0.0200		104	70-130			
Barium, total	0.0163	0.0050 mg/L	0.0161		101	70-130			
Beryllium, total	0.00412	0.00010 mg/L	0.00384		107	70-130			
Boron, total	0.175	0.0500 mg/L	0.191		92	70-130			
Cadmium, total	0.00398	0.000010 mg/L	0.00404		98	70-130			
Calcium, total	1.13	0.20 mg/L	0.938		121	70-130			
Chromium, total	0.0255	0.00050 mg/L	0.0256		99	70-130			
Cobalt, total	0.0217	0.00010 mg/L	0.0214		102	70-130			
Copper, total	0.0311	0.00040 mg/L	0.0322		97	70-130			
Iron, total	0.058	0.010 mg/L	0.0580		100	70-130			
Lead, total	0.00809	0.00020 mg/L	0.00796		102	70-130			
Lithium, total	0.0101	0.00010 mg/L	0.0102		99	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Regional District of Okanagan Similkameen
OK Falls (Vaseux Lake) via LAC

WORK ORDER REPORTED 21K0702
2021-11-12 13:14

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B1K1078, Continued									
Reference (B1K1078-SRM1), Continued					Prepared: 2021-11-09, Analyzed: 2021-11-11				
Magnesium, total	0.111	0.010 mg/L	0.112		99	70-130			
Manganese, total	0.0114	0.00020 mg/L	0.0120		95	70-130			
Molybdenum, total	0.0438	0.00010 mg/L	0.0438		100	70-130			
Nickel, total	0.0395	0.00040 mg/L	0.0394		100	70-130			
Potassium, total	0.77	0.10 mg/L	0.820		93	70-130			
Selenium, total	0.120	0.00050 mg/L	0.117		102	70-130			
Sodium, total	0.46	0.10 mg/L	0.490		94	70-130			
Strontium, total	0.264	0.0010 mg/L	0.276		96	70-130			
Thallium, total	0.0120	0.000020 mg/L	0.0118		102	70-130			
Uranium, total	0.00945	0.000020 mg/L	0.00970		97	70-130			
Vanadium, total	0.0284	0.0010 mg/L	0.0274		104	70-130			
Zinc, total	0.0994	0.0040 mg/L	0.0884		112	70-130			
Reference (B1K1078-SRM2)					Prepared: 2021-11-09, Analyzed: 2021-11-11				
Aluminum, total	0.189	0.0050 mg/L	0.198		95	70-130			
Antimony, total	0.0268	0.00020 mg/L	0.0230		116	70-130			
Arsenic, total	0.0218	0.00050 mg/L	0.0200		109	70-130			
Barium, total	0.0170	0.0050 mg/L	0.0161		106	70-130			
Beryllium, total	0.00409	0.00010 mg/L	0.00384		107	70-130			
Boron, total	0.154	0.0500 mg/L	0.191		80	70-130			
Cadmium, total	0.00412	0.000010 mg/L	0.00404		102	70-130			
Calcium, total	1.12	0.20 mg/L	0.938		119	70-130			
Chromium, total	0.0264	0.00050 mg/L	0.0256		103	70-130			
Cobalt, total	0.0222	0.00010 mg/L	0.0214		104	70-130			
Copper, total	0.0321	0.00040 mg/L	0.0322		100	70-130			
Iron, total	0.064	0.010 mg/L	0.0580		111	70-130			
Lead, total	0.00813	0.00020 mg/L	0.00796		102	70-130			
Lithium, total	0.0102	0.00010 mg/L	0.0102		100	70-130			
Magnesium, total	0.111	0.010 mg/L	0.112		99	70-130			
Manganese, total	0.0114	0.00020 mg/L	0.0120		95	70-130			
Molybdenum, total	0.0462	0.00010 mg/L	0.0438		106	70-130			
Nickel, total	0.0407	0.00040 mg/L	0.0394		103	70-130			
Potassium, total	0.85	0.10 mg/L	0.820		103	70-130			
Selenium, total	0.118	0.00050 mg/L	0.117		100	70-130			
Sodium, total	0.48	0.10 mg/L	0.490		98	70-130			
Strontium, total	0.269	0.0010 mg/L	0.276		97	70-130			
Thallium, total	0.0120	0.000020 mg/L	0.0118		102	70-130			
Uranium, total	0.00950	0.000020 mg/L	0.00970		98	70-130			
Vanadium, total	0.0315	0.0010 mg/L	0.0274		115	70-130			
Zinc, total	0.100	0.0040 mg/L	0.0884		114	70-130			

APPENDIX U

Impact of RDOS WWTP on Vaseux Lake and Okanagan River 2021 Annual Report

by Larratt Aquatics April 2022



LARRATT
AQUATIC

Impact of RDOS WWTP on Vaseux Lake and Okanagan River 2021 Annual Report

Prepared for Regional District Okanagan-Similkameen:

Executive Summary

The Regional District of Okanagan-Similkameen (RDOS) began operating a wastewater treatment plant (WWTP) for the community of Okanagan Falls in March 2013. The WWTP treats sewage to the tertiary level, which includes phosphorus removal. The plant discharges treated effluent into Okanagan River upstream of Vaseux Lake.

RDOS contracted Larratt Aquatic Consulting Ltd. (LAC) to sample Vaseux Lake monthly from March to November in the years 2013 to 2021 for the parameters required by BC ENV permit and to combine all available data into an annual report summarizing the impacts, if any, of the WWTP on Okanagan River and Vaseux Lake.

The WWTP discharged 181,707 m³ of treated effluent into Okanagan River in 2021 (133,758 m³ directly, 47,948 m³ via the new treatment wetland). The effluent contributed 516 kg of nitrogen and 22 kg of phosphorous, both the lowest to date. This represented only 0.45% of the total nitrogen load and 0.34% of the total phosphorus load in Okanagan River during 2021. These nutrients were transported 2.7 km down Okanagan River into Vaseux Lake. Nitrogen and phosphorus are the primary nutrients that fuel aquatic food chains.

Okanagan River was sampled 100 m upstream as well as 100 m and 500 m downstream of the WWTP to evaluate possible impacts of the treated effluent on the river. No statistically verifiable differences were detected for either total nitrogen or total phosphorus between upstream and downstream samples from 2013-2021. While, freshet and seasonal variation were the dominant influences on the data, there were subtle differences in chloride and conductivity between the upstream and downstream sites. Benthic invertebrate samples collected in October appeared to show an impact with lower species richness at the downstream site than the upstream site during most years but the effect of climate and the 2017-2018 freshets continued to outweigh any potential impacts from the WWTP.

Vaseux Lake began to develop thermal stratification in May and overturned in November in 2021. Decomposition of organics in the sediment depleted dissolved oxygen and caused the water below the thermocline to become anoxic by the end of summer each year. The Secchi depth, a measure of water clarity, ranged from 3.55 m to 7.25 m during 2021. Phosphorus increased during freshet as sediment were carried into the lake. Chloride, a common indicator for human impacts on aquatic systems, increased from 2013-2021. Vaseux Lake is a productive lake but total algae production was lower than recent very high productivity years.

From 2013-2021 there were no observed impacts from the WWTP operation on Vaseux Lake chemistry and biology. There appears to be subtle increases in chloride and conductivity in Okanagan River downstream of the WWTP and there may be a small impact on benthic invertebrates downstream of the plant discharge, although this pattern is not yet statistically significant.

Acknowledgements

Special thanks to Regional District of Okanagan-Similkameen staff, particularly Rina Seppen and Karen Moore, for their assistance in preparing this report.

Preferred Citation

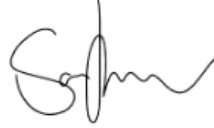
Self, J., Knezevic, S., 2022. Impact of RDOS WWTP on Vaseux Lake and Okanagan River Channel 2021 Annual Report. Larratt Aquatic Consulting Ltd. Prepared for the Regional District of Okanagan-Similkameen.

Report prepared by: Larratt Aquatic Consulting Ltd.

Jamie Self: Aquatic Biologist, R.P.Bio



Sara Knezevic: Field Biologist, B.Sc



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1.0 Introduction

1.1 Background

The Regional District of Okanagan-Similkameen (RDOS) began operating a new wastewater treatment plant (WWTP) for the community of Okanagan Falls on March 5, 2013. The WWTP is permitted to release treated effluent into Okanagan River. A 1.4 ha treatment wetland was constructed adjacent to the WWTP during 2020 and became operational during 2021. The goal of the wetland is to further reduce nutrient loading to Okanagan River.

A requirement of their Operational Certificate is to monitor the effects of the effluent on water quality within Okanagan River channel and in Vaseux Lake downstream (Figure 1, Table 1-1, Appendix 5). The results from 2021 are summarized in this report and are combined with data since 2013 to illustrate trends.

Table 1-1: Monitoring program frequency

Site	Frequency
WWTP	Weekly (Jan-Dec)
Wetland	Weekly (March to November when discharging to River)
Okanagan River	Chemistry: Monthly (Jan-Dec) Bacteria: Weekly (May-Sept) Benthic Invertebrates: Annually (Oct)
Vaseux Lake	Monthly (Mar-Nov)

1.2 Geography Overview

Okanagan Falls is a small town on the southern end of Skaha Lake in the Okanagan Valley of British Columbia (Figure 1). The Okanagan River flows from Skaha Lake and passes through Okanagan falls before flowing into Vaseux Lake to the south. Vaseux Lake is the smallest of the Okanagan mainstem lakes. The Okanagan Falls WWTP releases treated effluent into Okanagan River, 2.7 km upstream of Vaseux Lake. Vaseux Lake is shallow, averaging approximately 5 m, but has a small deep zone near the center that reaches 27 m (Appendix 6).

Vaseux Lake is a productive lake (meso-eutrophic; Nordin, 1985). The extensive aquatic macrophyte growth covering much of the shallows will remain an integral part of its environment regardless of varying nutrient inputs from Okanagan River (Appendix 6; CBCCB, 1974).



Figure 1: Overview map of Okanagan mainstem lakes and close-up of the area of study

2.0 Results and Discussion

2.1 Wastewater Treatment Plant Effluent

Temperatures of the treated effluent rose and fell seasonally (8.7 – 23.6 °C during 2021). The highest recorded temperature by the on-line analyzer in 2021 was 23.6 °C on August 4 (Figure 2). Water temperatures in the wetland exhibited greater variation and ranged from 2.9 – 23.5 °C during 2021. Effluent pH was stable over the past 5 years and averaged 6.92 ± 0.08 during 2021 (Field pH).

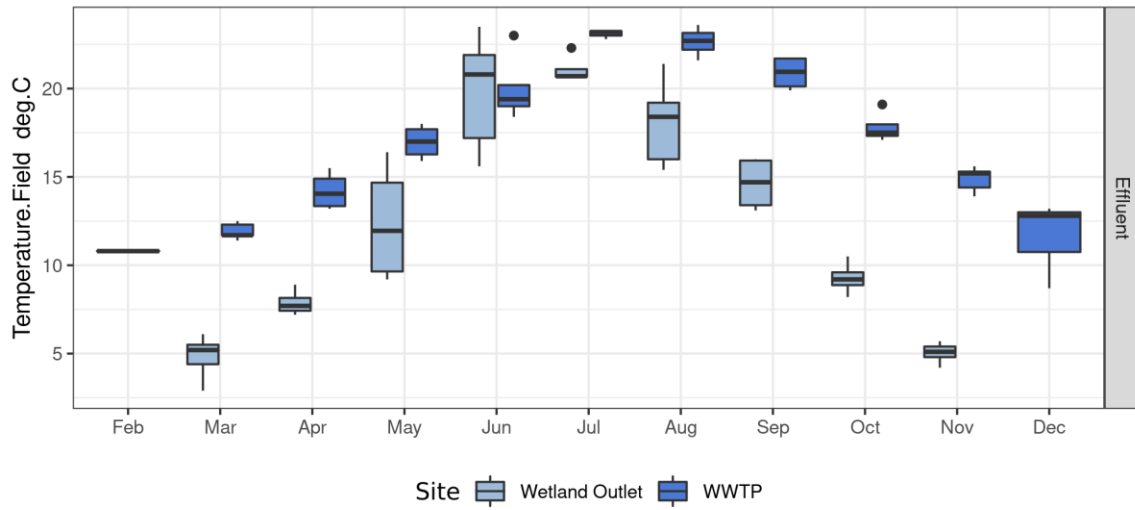


Figure 2: Monthly temperature of treated effluent before it enters Okanagan River during 2021

Daily discharge from the WWTP to Okanagan River during 2013-2021 averaged 542 ± 128 m³/day. Flows typically peaked during the summer high demand period when seasonal residences are full. Discharge during 2021 was close to the 2013-2020 average throughout the year (Figure 3). 133,759 m³ was released from the WWTP directly into Okanagan River while an additional 80,639 m³ was released into the new treatment wetland with 47,948 m³ released into Okanagan River from the wetland for a total of 181,707 m³ of treated effluent released into Okanagan River (Figure 4). Comparatively, the 2021 annual discharge for the Okanagan River was 461 million m³ (Water Office, 2021). The WWTP effluent therefore made up only 0.04% of the total flow in Okanagan River at Okanagan Falls during 2021.

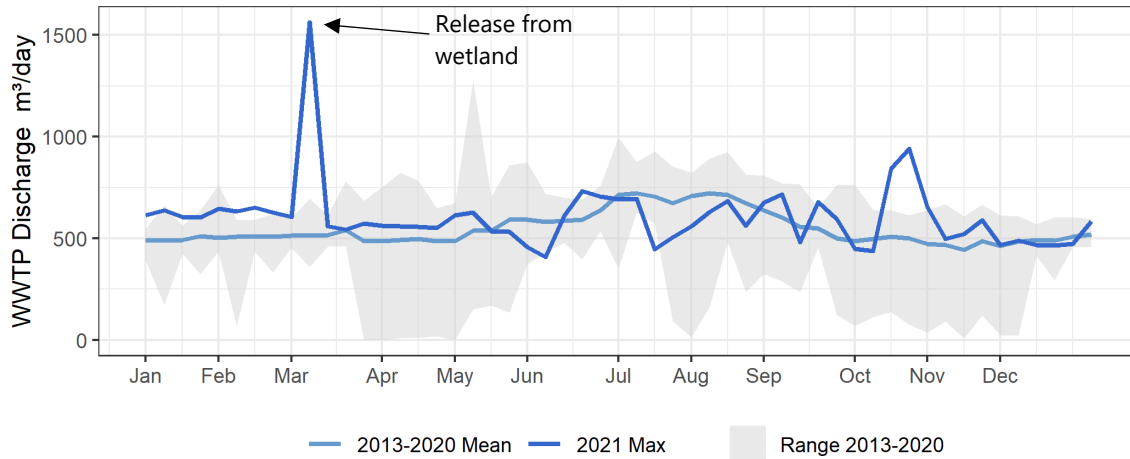


Figure 3: Weekly average discharge from the WWTP, 2013-2021

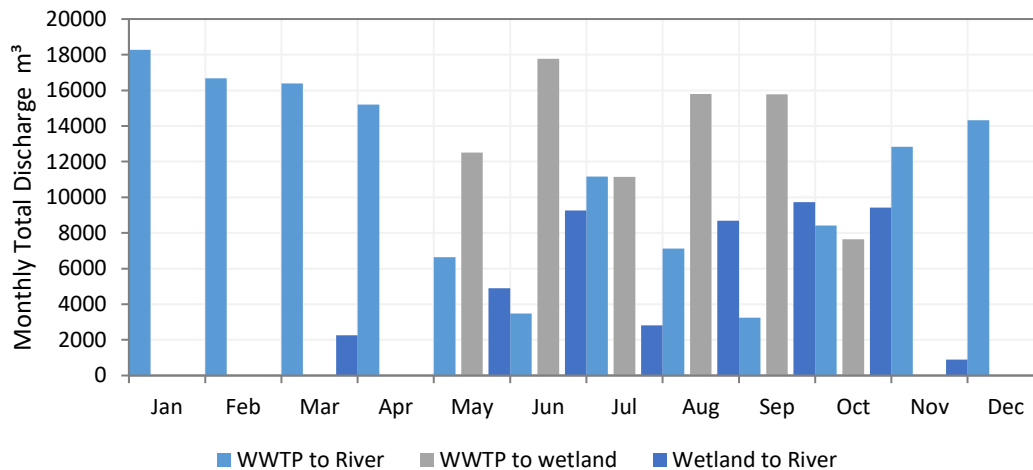


Figure 4: Comparison of discharge from WWTP to Okanagan River and the new polishing wetland during 2021

Nutrients released from the WWTP are a potential concern for downstream water bodies. Effluent concentrations of total nitrogen as well as nitrate, the most biologically available form of nitrogen, decreased from 2013 to 2021 (Mann-Kendall, $p < 0.001$; Figure 6). The declining trend appears to be stabilizing within the past 2-3 years and is likely related to increased WWTP efficiency.

Total nitrogen averaged 3.37 ± 1.12 mg/L as N in the WWTP discharge during 2021 (mean of 4.99 ± 2.48 mg/L as N from 2013-2021). In 2021, 516 kg of total nitrogen was added to Okanagan River from the WWTP¹, the lowest annual total since the plant began operating (mean of 1031 ± 411 kg/yr as N from 2013-2021; Appendix 2). There was a significant declining trend in TN

¹ This represents the load from the WWTP directly into Okanagan River + the load from the Wetland into Okanagan River.

concentration from the WWTP during 2013-2021 (Mann-Kendall, $p < 0.001$). The WWTP discharged 235 kg of nitrate in 2021 (mean of 503 ± 209 kg/yr as N from 2013-2021) with an annual average effluent nitrate concentration of 1.68 ± 1.06 mg/L as N in the direct WWTP release (2.72 ± 1.64 mg/L as N from 2013-2021) compared to only 0.049 ± 0.077 mg/L as N in the wetland releases (Figure 6). Nitrogen released from the WWTP accounted for 0.45 % of the annual total nitrogen load flowing into Vaseux Lake in 2021. Nitrate was regularly below detection in Okanagan River samples, making it difficult to accurately determine the percent of total load contributed by the WWTP. In the data collected to date, the WWTP has supplied up to 10% of the nitrate load during low flow periods (Table 2-1).

The new wetland was highly effective at reducing the nitrogen concentration in the treated effluent reducing TN concentration from 3.37 ± 1.11 mg/L as N in the direct effluent to 0.92 ± 0.22 mg/L as N in the wetland outlet, a 73% reduction (Figure 5). Nitrate was similarly reduced by 93% while ammonia was reduced by 76% through the treatment wetland.

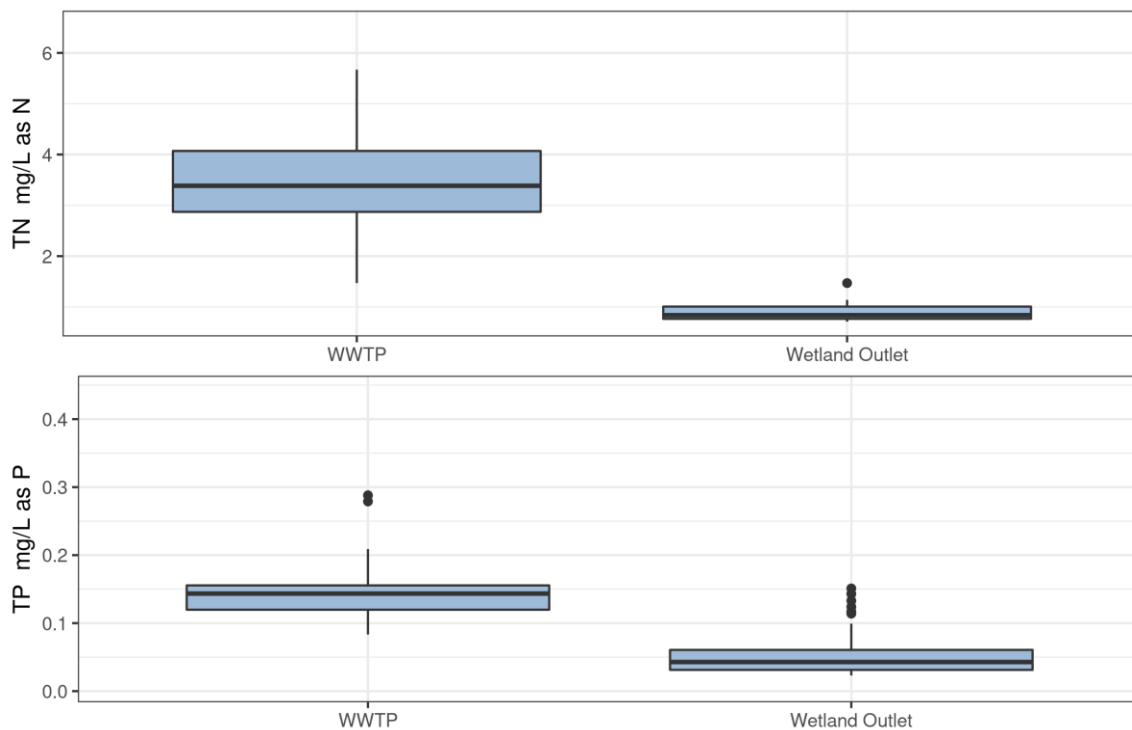


Figure 5: Comparison of TN and TP concentrations in WWTP and Wetland effluent discharges during 2021

WWTP effluent phosphorus concentrations were stable from 2014-2021 and averaged 0.143 ± 0.039 mg/L as P during 2021 (0.179 ± 0.171 mg/L in 2013-2021; Figure 6). The Wetland discharge averaged only 0.055 ± 0.035 mg/L as P, a 62% reduction compared to the direct effluent (Figure 5). The total annual phosphorus load contributed by the WWTP measured 22 kg in 2021, the lowest annual total to date (mean of 32 ± 7 kg/yr as P from 2013-2021; Figure 6). During the low flow period, the WWTP contributed up to 0.8 % of the total phosphorus load flowing into Vaseux Lake in 2021 (0.34% of total 2021 load; Table 2-1), which is an important consideration because phosphorus is more limited in aquatic environments than nitrogen.

Table 2-1: Comparison of nutrient loadings into Okanagan River by the WWTP, 2021

Month	WWTP Loadings (kg/yr)			% of Total Monthly Load into Vaseux Lake		
	TN	NO ₃	TP	TN	NO ₃ *	TP
Jan	80	43	-	1.1%	-	-
Feb	95	58	2.5	1.0%	-	0.4%
Mar	39	21	3.5	0.4%	-	0.7%
Apr	22	1	2.2	0.2%	-	0.1%
May	18	0	0.9	0.1%	-	0.09%
Jun	21	5	0.9	0.1%	-	0.29%
Jul	40	27	1.7	0.6%	-	0.5%
Aug	26	16	1.1	0.3%	-	0.5%
Sep	20	7	0.8	0.3%	-	0.5%
Oct	39	17	1.2	0.5%	-	0.5%
Nov	56	21	2.1	1.5%	-	0.8%
Dec	60	19	2.5	1.5%	-	0.6%

*Nitrate was below detection (<0.010 mg/L as N) at the upstream Okanagan River site in samples from 2021

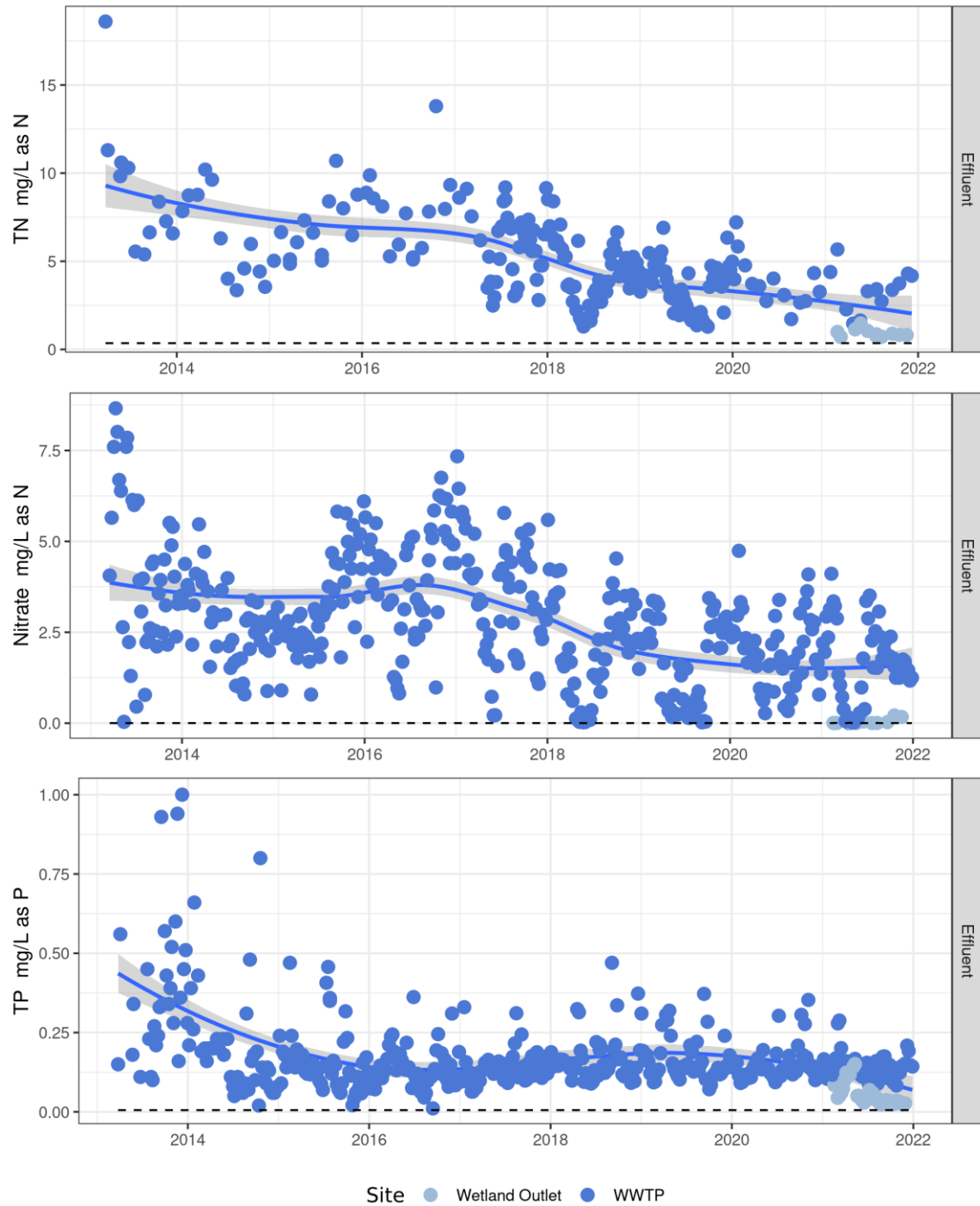


Figure 6: TN, Nitrate and TP concentrations in the treated effluent in 2013-2021

Fecal bacteria and *E. coli* samples collected in the treated effluent contained very low counts with 83% of samples having undetectable *E. coli* during 2021 and only 2 samples having >1 CFU/100mL. While the new treatment wetland was very effective at removing nutrients, it was a net source of fecal bacteria into Okanagan River averaging 78 ± 251 CFU/100mL (Figure 7). The surge in fecal bacteria in the wetland was sudden, rising from 6 CFU/100mL on August 10

to 1410 CFU/100mL on August 27 before declining through September. The cause of the surge is unclear given that no similar increase was noted in the direct WWTP effluent and may relate to a period of intense waterfowl use. Fecal bacteria in the direct effluent discharge were nearly always lower than the receiving Okanagan River water (Figure 12).

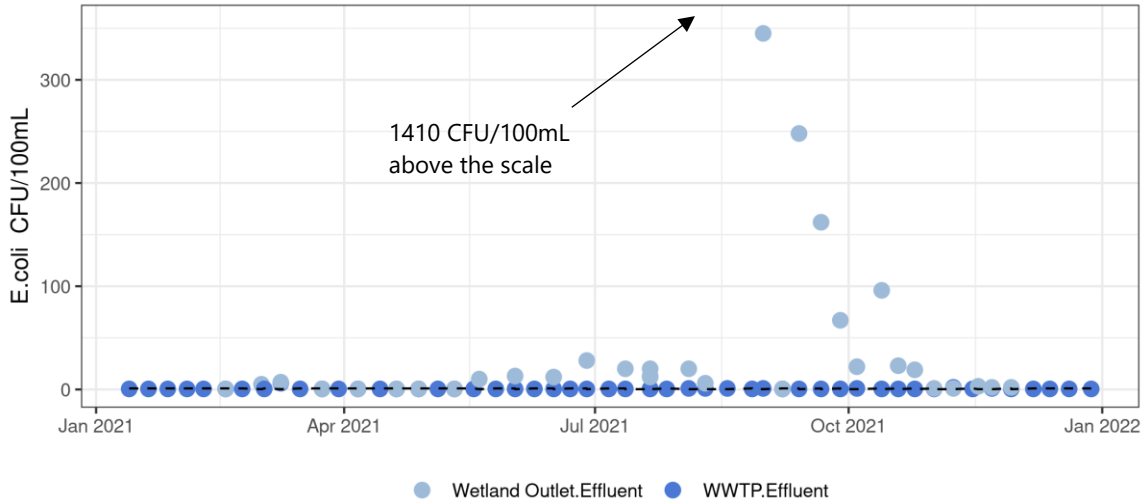


Figure 7: *E.coli* in treated WWTP effluent during 2021

2.2 Okanagan River

2.2.1 Flow

Okanagan River is by far the largest inflow to Vaseux Lake. The annual discharge for Okanagan River was 461 million m³ in 2021 and was much smaller than the record 2020 total discharge (Figure 8). The WWTP contributed 181,707 m³ of effluent to the river, representing only 0.04% of the total annual water volume entering Vaseux Lake via Okanagan River (Figure 8).

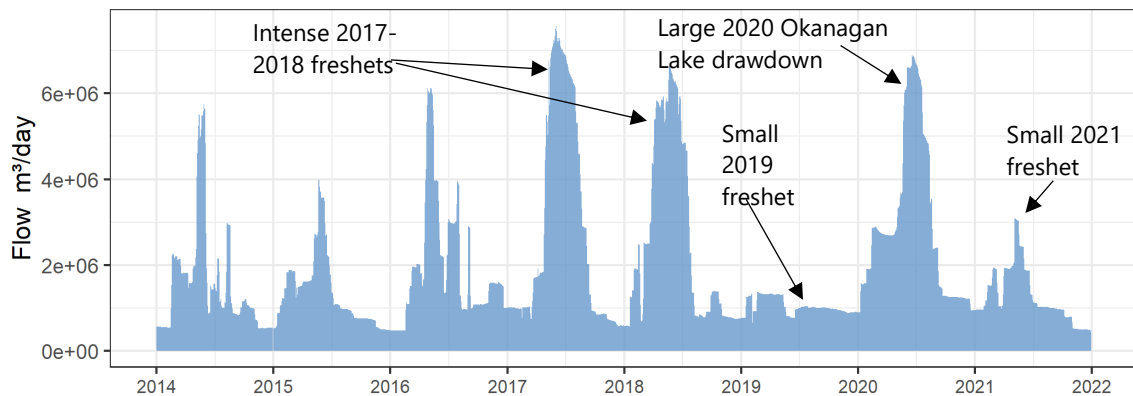


Figure 8: Daily flow in Okanagan River at Okanagan Falls, 2014-2021

Note: significantly larger shaded area surrounding 2017 and 2018, 2020 freshets = substantially more water flowing through Vaseux Lake

2.2.2 Water Chemistry

Conductivity showed dramatic seasonal variation with low concentrations during freshet, and higher concentrations through the fall and winter as groundwater contributions to the river became more important (Figure 9). Conductivity averaged $267.1 \pm 11.7 \mu\text{S}/\text{cm}$ at the upstream site and $272 \pm 6.5 \mu\text{S}/\text{cm}$ at the 500 m downstream site during 2021. While the difference between upstream and downstream was not statistically significant (KW-Test, $p=0.09$), the downstream site measured higher than the upstream in 64% of samples with an average difference of $2.5 \pm 5.4 \mu\text{S}/\text{cm}$. This may be a subtle marker of the effluent plume downstream of the WWTP.

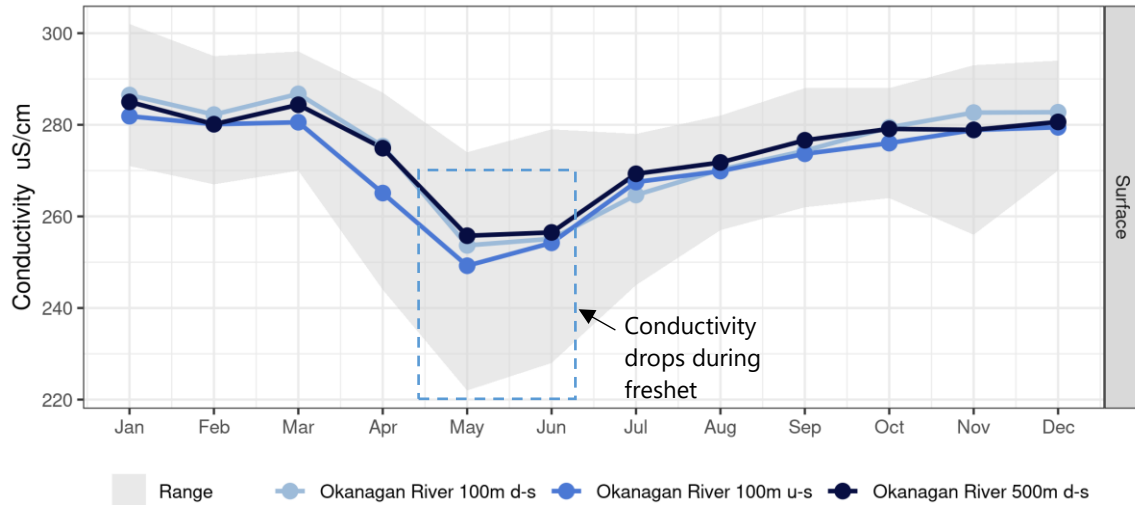


Figure 9 : Conductivity in Okanagan River by month, 2013-2021

Chloride has increased by 27% from 2013 to 2021 at the upstream 100 m site (Figure 10, Mann-Kendall, $p<0.001$). Chloride averaged $5.87 \pm 0.30 \text{ mg}/\text{L}$ and $6.00 \pm 0.27 \text{ mg}/\text{L}$ 100m upstream and 500 m downstream sites respectively during 2021. As with conductivity, the difference was not statistically significant (KW-Test, $p=0.24$) but 73% of samples to date showed higher chloride at the 500 m downstream site than the 100 m upstream site. During 2021, 11 out of 12 samples measured higher chloride at the downstream site by an average of $0.13 \pm 0.09 \text{ mg}/\text{L}$.

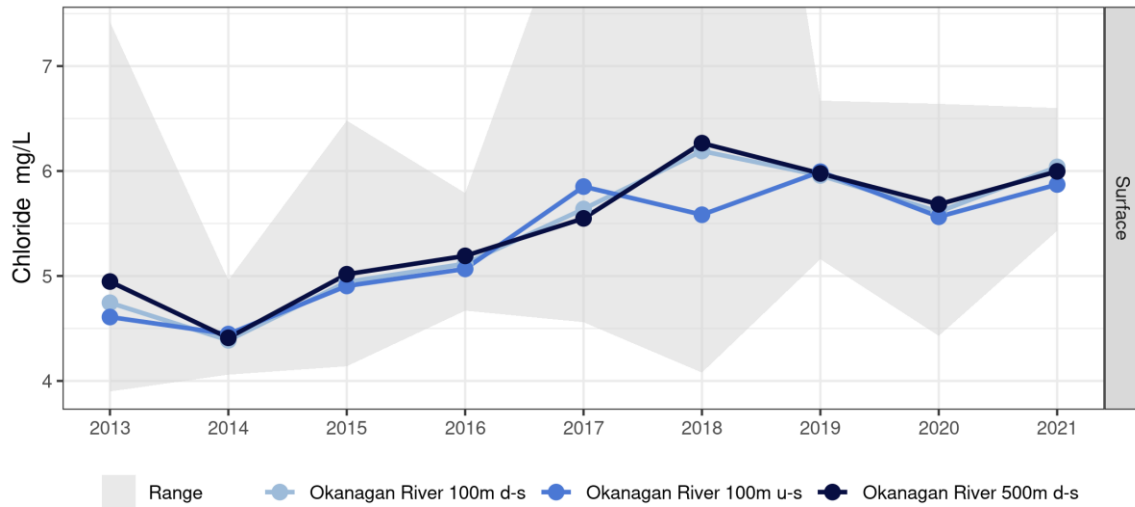


Figure 10: Annual chloride averages (mg/L) upstream and downstream of the WWTP from 2013-2021

pH was stable at all three river sites from 2013-2021 with a short term oscillating pattern. This pattern in pH has been observed in numerous lakes throughout the Okanagan and is driven by climate. The effluent pH was consistently lower than the pH of the river sites.

Both total nitrogen and total dissolved phosphorus (TDP) decreased upstream and downstream of the WWTP from 2013–2015 (Mann-Kendall, $p \leq 0.001$) but have plateaued since 2015. TN averaged 0.243 ± 0.042 mg/L as N at the upstream river site during 2021. Nitrate was routinely undetectable in Okanagan River samples because it is rapidly consumed by macrophytes, phytoplankton, and periphyton. Ammonia results were impaired by the increase in lab detection limit from 2020-2021 that masked most results.

TP includes phosphorus associated with suspended sediment. TP concentrations increase in wet years and during freshet but decrease in dry years. TP averaged 0.0139 ± 0.0081 mg/L as P at the upstream river site during 2021 (0.0188 ± 0.0301 mg/L as P from 2013-2021).

There was no statistically significant difference between samples taken upstream and downstream of the WWTP for any forms of nitrogen or phosphorus during 2013-2021 (Kruskal-Wallis tests, Figure 11).

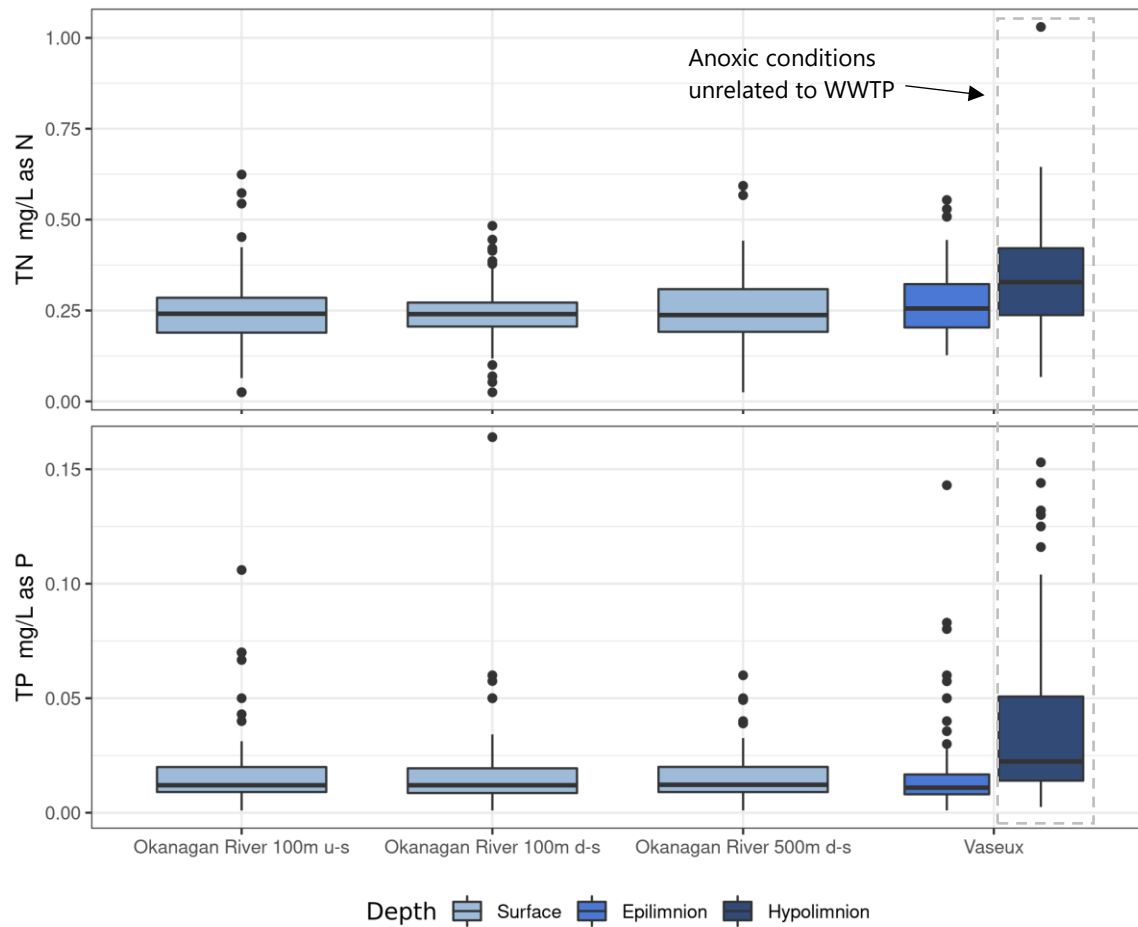


Figure 11: Average TN, TP at Okanagan River and Vaseux Lake sample locations upstream and downstream of the WWTP from 2013 to 2021

Notes:

-Vaseux Lake surface was comparable to Okanagan River for both parameters. Anoxic conditions in the hypolimnion of Vaseux Lake increases nutrient concentrations unrelated to the WWTP

Water Quality Exceedances

Aluminum exceeded BC guideline for the protection of aquatic life during freshet 2021 at all three Okanagan River sample sites. Aluminum is associated with sediment and routinely exceeds guidelines during freshet when water has a high sediment load. There was also an exceedance of the total copper MAC in October 2021 at the 500 m downstream site. There was a similar exceedance during October 2020 at the 100 m downstream site. Flow in Okanagan River during October is relatively low, reducing dilution of the WWTP effluent stream and possibly resulting in these exceedances. However, the connection is not clear because at the same time as these samples were collected, copper was much lower in the direct effluent stream.

2.2.3 Bacteria

Bacteriological sampling was performed at the three sites along Okanagan River upstream and downstream of the WWTP. The data exhibited strong seasonal variation with *E. coli* counts increasing with water temperature from 2013-2021 (Figure 12). Bacteria counts in the effluent were very low, resulting in no significant differences between the upstream or downstream sites in the 2013 - 2021 data (KW-Test, $p=0.87$). *E. coli* counts in the WWTP effluent were much lower than the receiving river throughout 2021 (Figure 12).

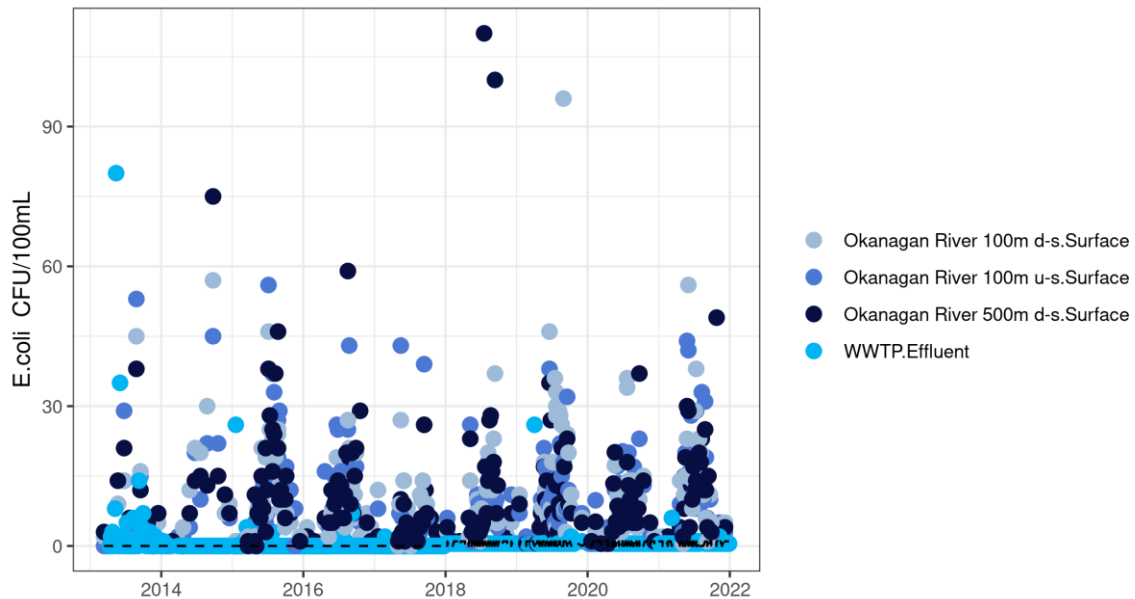


Figure 12: *E. coli* counts in samples from Okanagan River and the WWTP, 2013-2021

2.2.4 Benthic Invertebrates

Benthic invertebrates were sampled at the three sites along Okanagan River in October during 2014-2021 (2015 excluded). The results are presented in Figure 13. A healthy river normally has higher values for species richness and EPT² richness than an unhealthy river. EPT is a taxonomic index made up pollution sensitive species such as mayflies. *Diptera* are a class of fly larvae that are considered tolerant of pollution, indicating declining health of the river. Overall species richness was stable in Okanagan River over the 2014-2021 dataset (Figure 13). During most years, 2021 included, benthic invertebrate metrics show a consistent pattern of greater diversity and higher abundance of pollution sensitive taxa upstream than downstream of the WWTP, although the pattern was not statistically significant.

The benthic invertebrate data indicate that Okanagan River is not a healthy water body and that the WWTP may be impacting benthic invertebrates in some years. Despite the potential impact during some years, upstream impacts appear to play a larger role with EPT and species richness. There were also no year-over-year trends in the benthic invertebrate metrics to suggest an ongoing degradation in habitat quality.

² EPT stands for *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), *Trichoptera* (caddisflies)

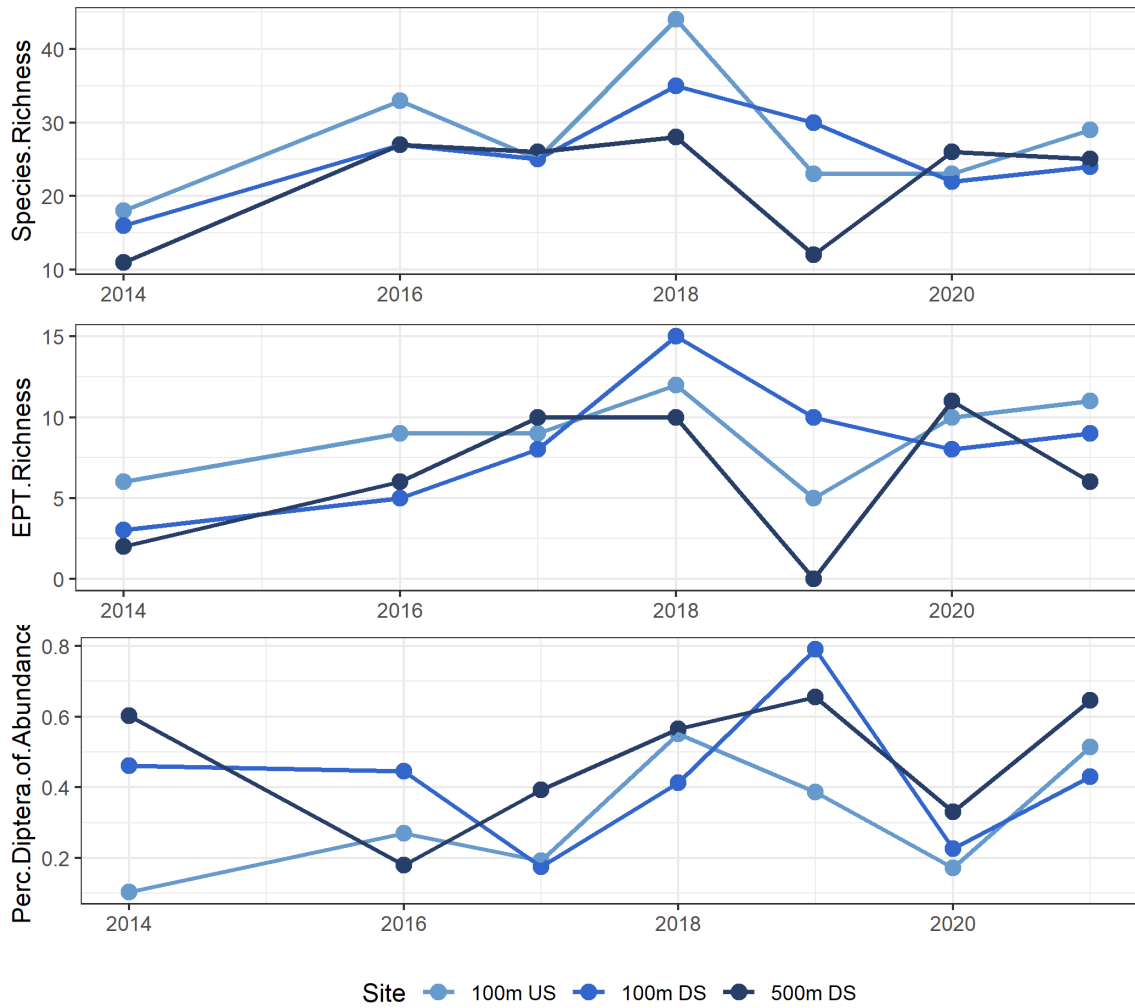


Figure 13: Species richness, EPT richness, and percent Diptera in Okanagan River benthic invertebrates, 2014-2021

2.3 Vaseux Lake

2.3.1 Limnology

Vaseux Lake is a small shallow lake with a volume of only 17.6 million m³ and a short theoretical residency time of under two weeks. Okanagan Lake, for comparison, contains 262 billion m³ of water and has an average residency time of 60 years (CBCCB, 1974).

2021 was the hottest year on record for the Interior of BC, setting record high temperatures throughout the Okanagan. In addition to extreme heat the Okanagan experienced the driest summer on record with creeks, including Vaseux Creek, drying out completely.

Vaseux Lake quickly warms each summer to 23-25 °C at the surface and the peak recorded surface temperature in 2021 was 24.6 °C (Figure 16, Figure 14). Both June and July experienced their highest monthly surface temperature recordings during 2021 (20.8 °C and 24.4 °C respectively). This is attributed to record high air temperatures throughout the valley. Vaseux Lake develops stable thermal stratification most years from May to November. Fall overturn occurred earlier than previous years from 2019-2021; the lake was fully mixed by the November 4, 2021 sampling trip. Vaseux Lake freezes over completely each winter with ice-off typically occurring during the first half of March. Vaseux lake froze lightly for approximately 2 weeks during mid-February 2021.

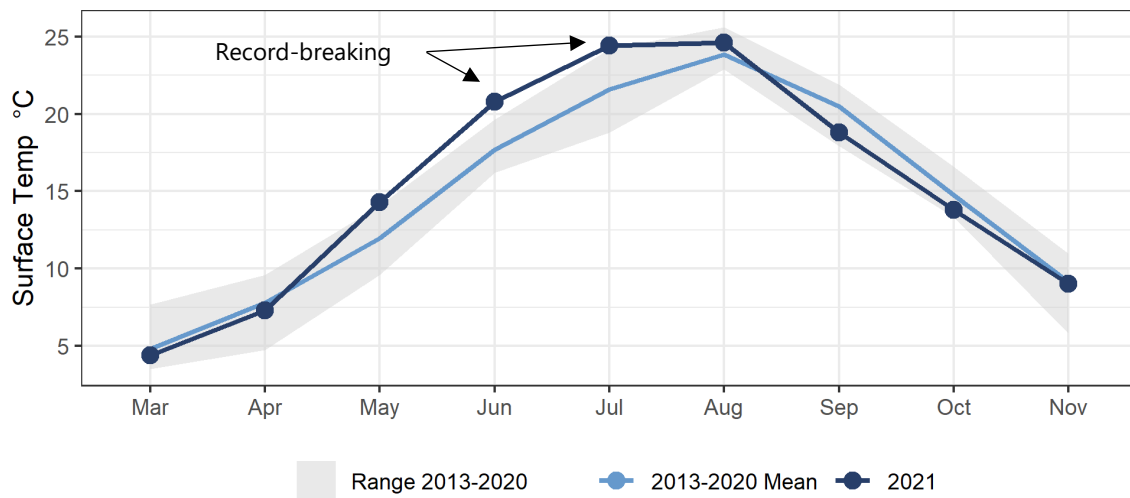


Figure 14: Surface temperature in Vaseux Lake during 2021 compared to 2013-2020 average

pH recordings were collected each month. During periods of mixing, pH measurements appeared to be relatively similar at all depths and varied during periods of stratification (Figure 15). Water depths comprising the epilimnion contained higher pH recordings than the hypolimnion, especially while the anoxic zone was present (Figure 15). Differences can be attributed to photosynthetic processes that increase pH in the epilimnion and anoxic conditions which cause pH to decrease in the hypolimnion.

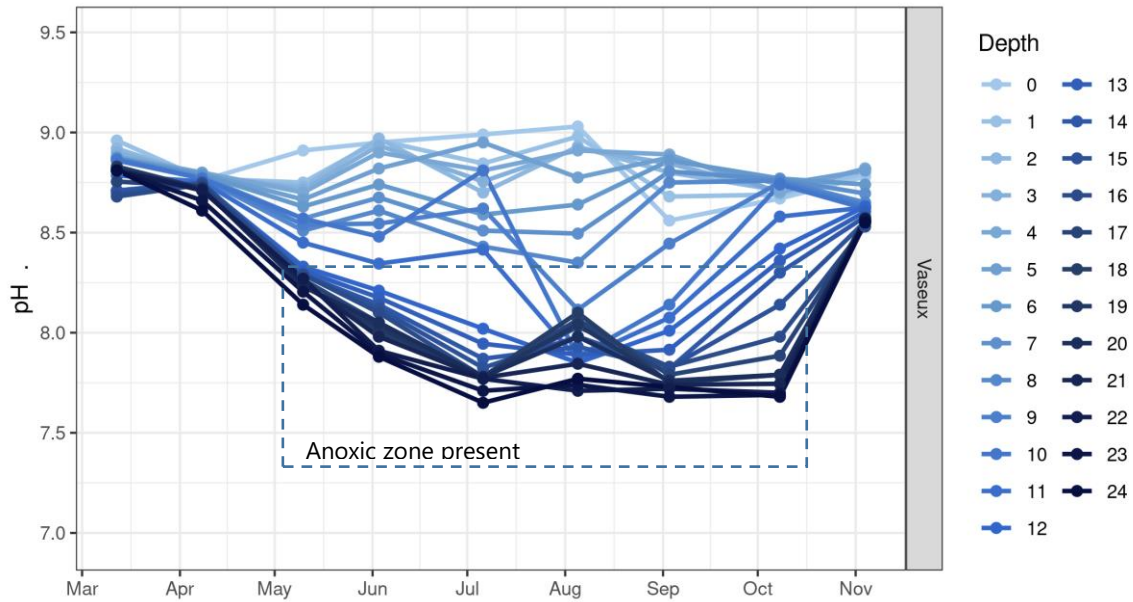


Figure 15: pH recordings of Vaseux Lake during 2021

Vaseux is a productive lake. It produces large quantities of organic material (aquatic macrophytes, algae, and bacteria) throughout the growing season. This organic material settles to the sediment and decomposes. Decomposition of organic compounds consumes oxygen from the overlying water column and releases nutrients. Vaseux Lake sediments exert a strong oxygen demand and rendered essentially all the water below the thermocline completely anoxic by September from 2013 - 2021 (Figure 16). Approximately ¼ of the entire lake's volume becomes anoxic each summer.

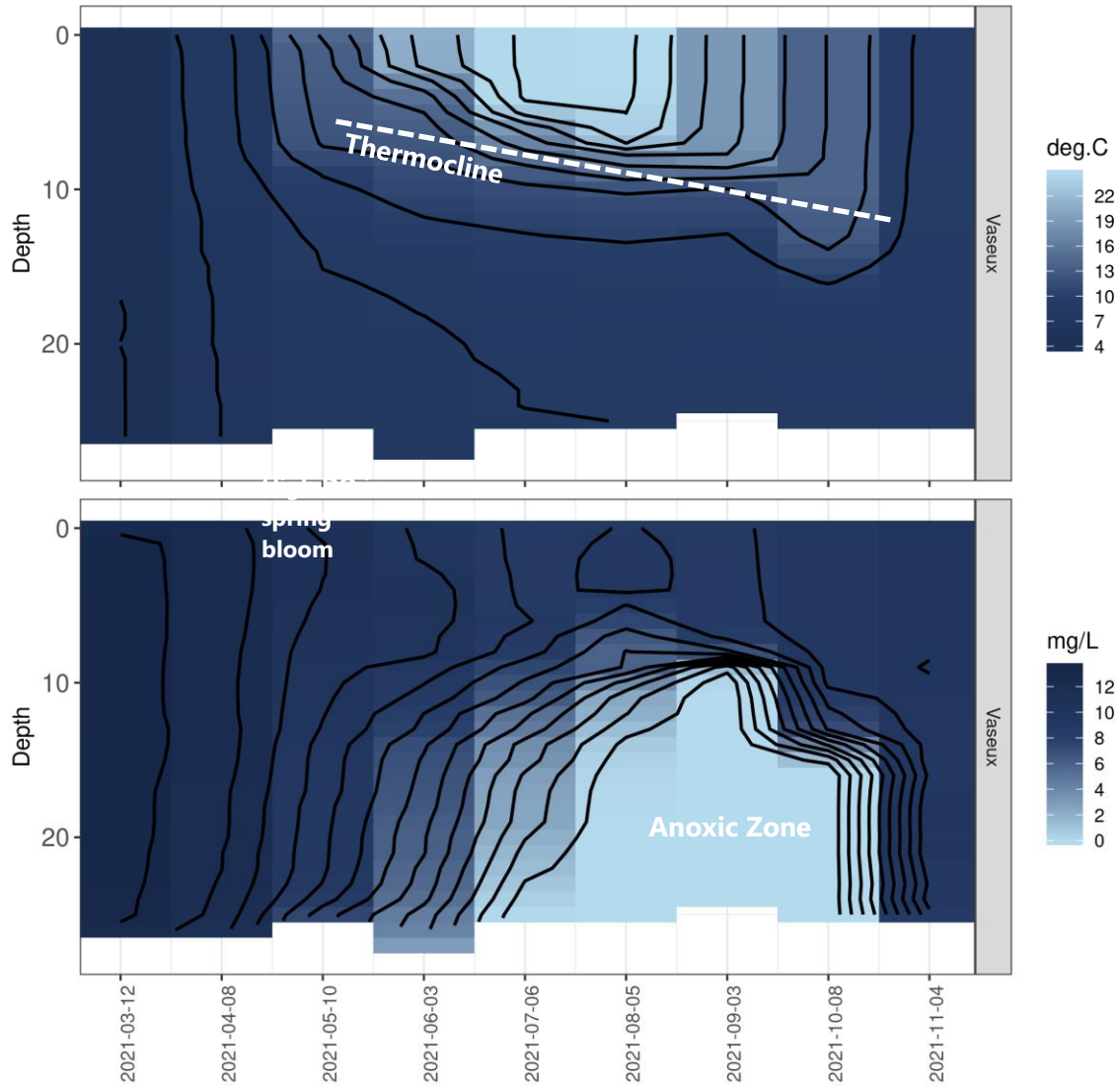


Figure 16: Temperature (top) and dissolved oxygen (bottom) profiles for Vaseux Lake during 2021

Water clarity in Vaseux Lake was moderate with an average Secchi depth of 5.5 ± 1.16 m in 2021 (Figure 17). Secchi depth was close to the 2013-2020 average, and within the recorded range for the entire 2021 growing season. Unlike 2020, the Secchi was above average during freshet 2021 (Figure 17).

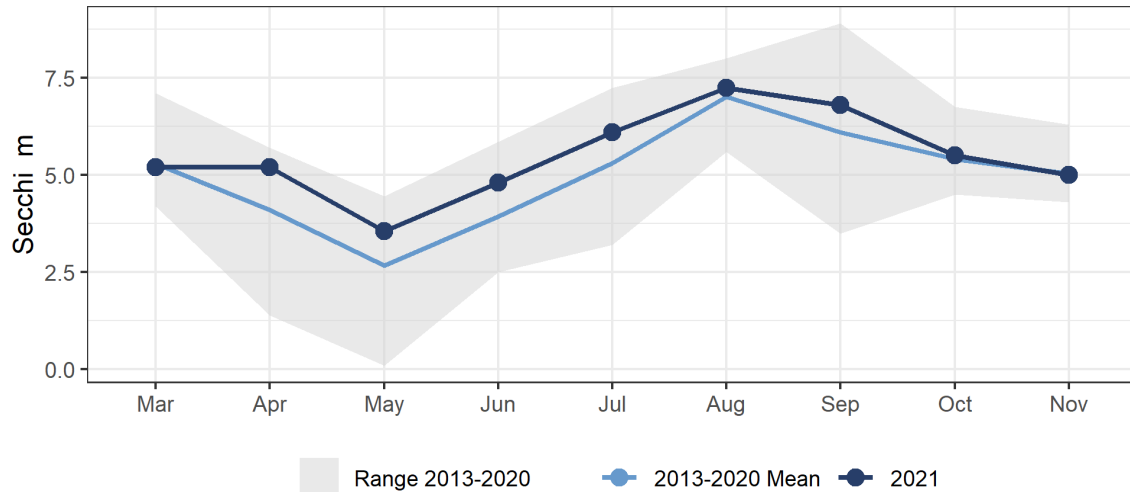


Figure 17: Secchi depth in Vaseux Lake in 2013-2021

2.3.2 Water Chemistry

Seasonal variation in most parameters is far greater than the impact of the WWTP. The contribution of the WWTP relative to base Okanagan River flows is very small and the residency time of Vaseux Lake is very short, all factors that mitigate possible adverse impacts as nutrients are flushed away before they can accumulate.

Nutrients – Annual Variation

Based on the concentrations of nitrogen and phosphorus, Vaseux Lake is defined as meso-eutrophic or highly productive. Total nitrogen (TN) concentrations of the epilimnion have declined from 2013-2021 and averaged 0.265 ± 0.10 mg/L as N in 2021 (Mann-Kendall, $p=0.007$). TN concentrations in the hypolimnion were record high during 2021, measuring 1.03 mg/L as N on July 6. The cause of this unusually high result is unclear but was related to elevated organic nitrogen; all forms of inorganic nitrogen (nitrate, nitrite, ammonia) that were measured were low. TN and total phosphorous (TP) concentrations have been stable from 2013-2021 in both the epilimnion and hypolimnion³ (Figure 18). On October 7, 2021, TP concentrations in the hypolimnion were record high and measured 0.192 mg/L because of release from highly anoxic sediments. Dissolved phosphorus increases in the hypolimnion each summer in Vaseux Lake.

For comparison, total nitrogen, and phosphorus concentrations in Okanagan Lake during 2021 (measured at Summerland⁴) averaged 0.24 ± 0.02 mg/L TN and 0.005 ± 0.001 mg/L TP (ENV, 2021). Dissolved phosphorus was stable in Vaseux Lake from 2013 to 2021 (Mann-Kendall, $p=0.90$) and in the Okanagan River upstream of the WWTP from 2015-2021 (Figure 11).

³ Average 2021 epilimnion TP = 0.013 ± 0.003 mg/L | Average 2021 hypolimnion TP = 0.065 ± 0.060 mg/L

⁴ ENV Site 0500454

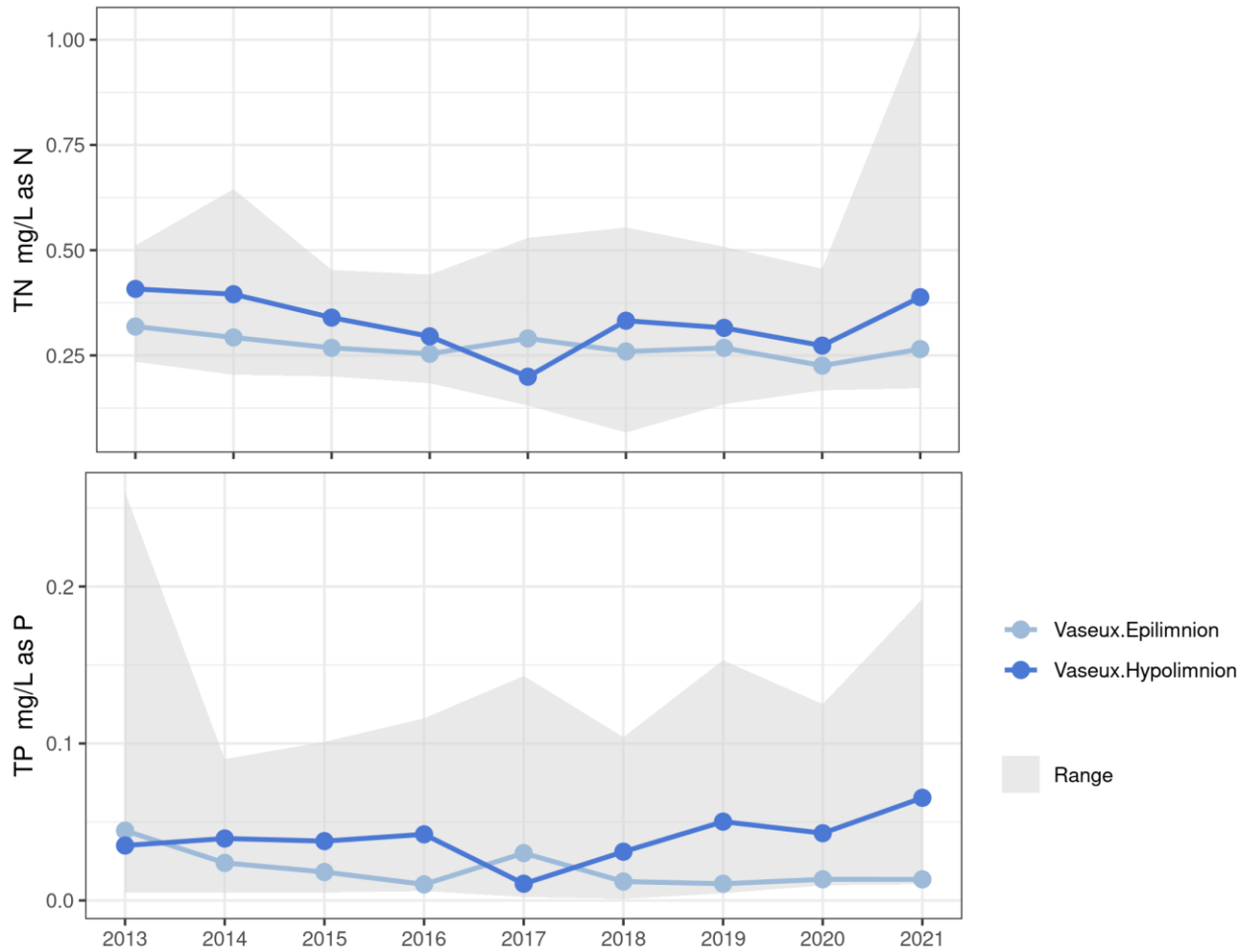


Figure 18: Total nitrogen and phosphorus in Vaseux Lake from 2013-2021

Ammonia increased significantly in the Vaseux hypolimnion from 2013-2021 (Figure 19; Mann-Kendall, $p < 0.001$). Epilimnetic ammonia concentrations averaged 0.088 ± 0.105 mg/L as N in 2021⁵. Ammonia concentrations in the hypolimnion were also record high on October 7, like TP, and measured 0.327 mg/L. A rise in ammonia concentrations was noted in Vaseux Lake and the upstream Okanagan River sites during 2017-2019 because of greater groundwater inflows during the 2017-2018 flooding. The WWTP represented only 0.64% of the ammonia reporting to Vaseux Lake in 2021 (Appendix 2).

⁵ Lab detection limit was stable at 0.02 mg/L from 2013-2019 and was changed to 0.05 mg/L in 2020 without notifying LAC. This resulted in 100% non-detect values in the epilimnion during 2020. This error was corrected for 2021 Vaseux Lake samples but still affected River samples.

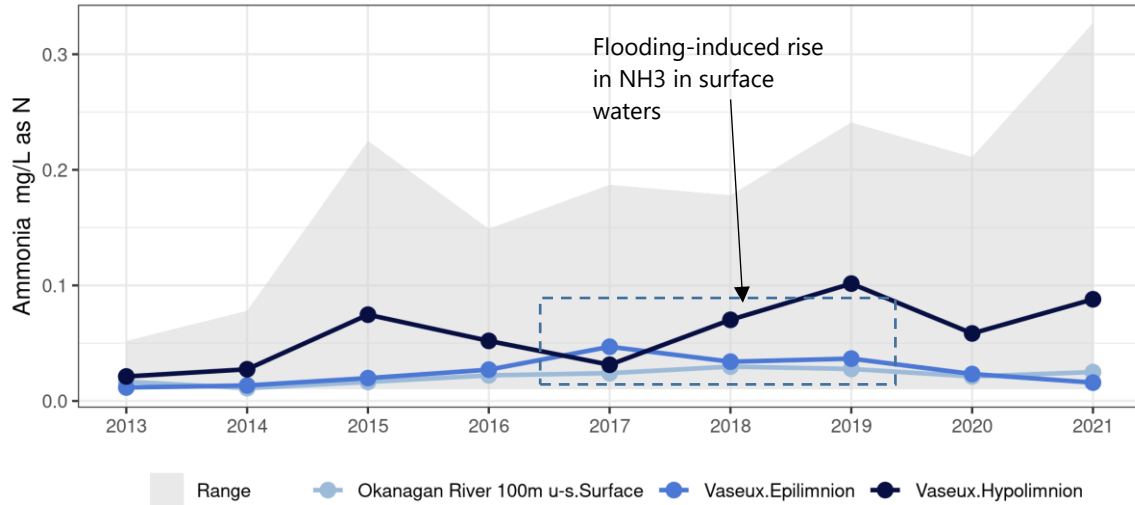


Figure 19: Ammonia concentration in Okanagan River and Vaseux Lake, 2013-2021

Nutrients – Seasonal Variations

Total nitrogen was relatively stable during the 2021 freshet in the hypolimnion while the epilimnion exhibited an increase in June (TN = 0.172 mg/L on May 10th and 0.443 mg/L on June 3). TP increased in the hypolimnion during freshet and increased to record high concentrations as the anoxic zone developed through the summer and into the fall.

During freshet suspended sediment often carries phosphorus adsorbed onto particulates and in organic material (Figure 20). Okanagan River transports phosphorus into Vaseux Lake on particulates where they are then deposited. The deep water of Vaseux Lake contained higher nutrient concentrations than the surface. This is because sediment nutrients are released into deep waters under anoxic conditions (Figure 18, Figure 20).

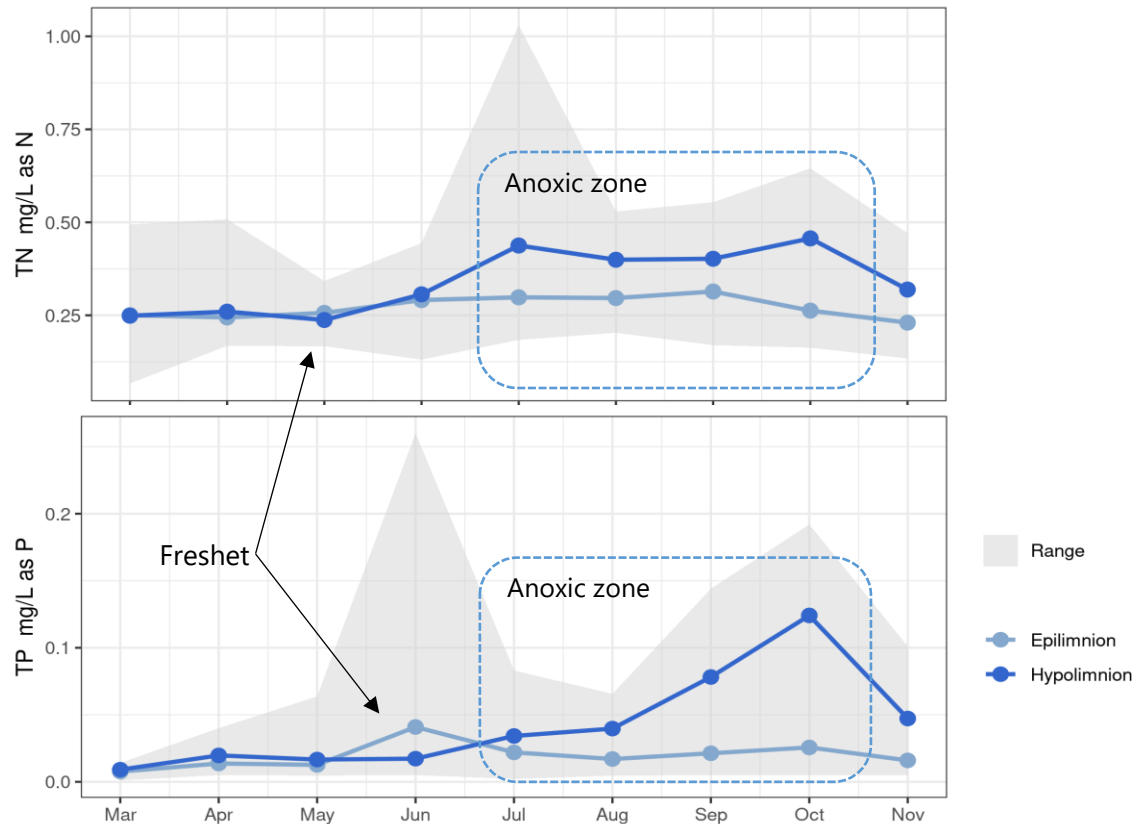


Figure 20: Monthly total nitrogen and total phosphorus epilimnion and hypolimnion samples from Vaseux Lake, 2013-2021

Nutrients - Loading

Most nutrients that flow into Vaseux Lake come from Okanagan River. In 2021, 99.5% of the total nitrogen (114,970 kg) and 99.7% of total phosphorus (6,387 kg) from external sources came from Okanagan River whereas the WWTP only contributed 0.45% and 0.34% TN and TP respectively (loadings based on concentrations in Okanagan River samples upstream of WWTP). Internal loading from the anoxic zone is a significant source of nutrients to Vaseux Lake. An estimate developed as part of the 2018 Vaseux Lake Land Use Study and showed that internal loading accounted for approximately 6% of total nitrogen, 30% of nitrate, 11% of total phosphorus, and 30% of dissolved phosphorus in Vaseux Lake (Larratt and Self, 2019).

There were no historic data on nutrient conditions available from the ENV database. However, the 1974 Okanagan Basin Water Report describes nutrient ranges of 0.03-0.39 mg/L as P of total phosphorus and 0.01-1.06 mg/L as N of total nitrogen (CBCCB, 1974). 2013-2021 nitrogen concentrations fell within or below these ranges, indicating that nutrient conditions in Vaseux improved between 1974 and 2013, likely with the introduction of nutrient removal at upstream wastewater treatment plants during the 1970s-1980s.

To date, sampling has not detected a significant WWTP impact on Vaseux Lake water chemistry. This is likely because of the low WWTP loading rate and the rapid flushing rate of

Vaseux Lake (theoretical residence time of only two weeks) that moves nutrients downstream before they can accumulate.

Chloride/Road Runoff

Chloride can be used as an indicator of human impacts on aquatic systems. The largest source of anthropogenic chloride is typically road-salt, followed by sewage effluents (Figure 21, WWTP discharge averaged 117 ± 10 mg/L during 2021). Chloride increased significantly from 2013 to 2021 and averaged 5.93 ± 0.25 mg/L during 2021 in the epilimnion Vaseux Lake (Mann-Kendall, $p < 0.001$; Figure 22; Appendix 2). Over the long term (decades), chloride is likely to continue increasing as it does in the other Okanagan mainstem lakes. These chloride concentrations were far below the aquatic life guideline (< 600 mg/L) and are unlikely to affect any aquatic plants or animals in the foreseeable future; however, the trend is undesirable and indicates ongoing impacts to the upstream urban watershed.

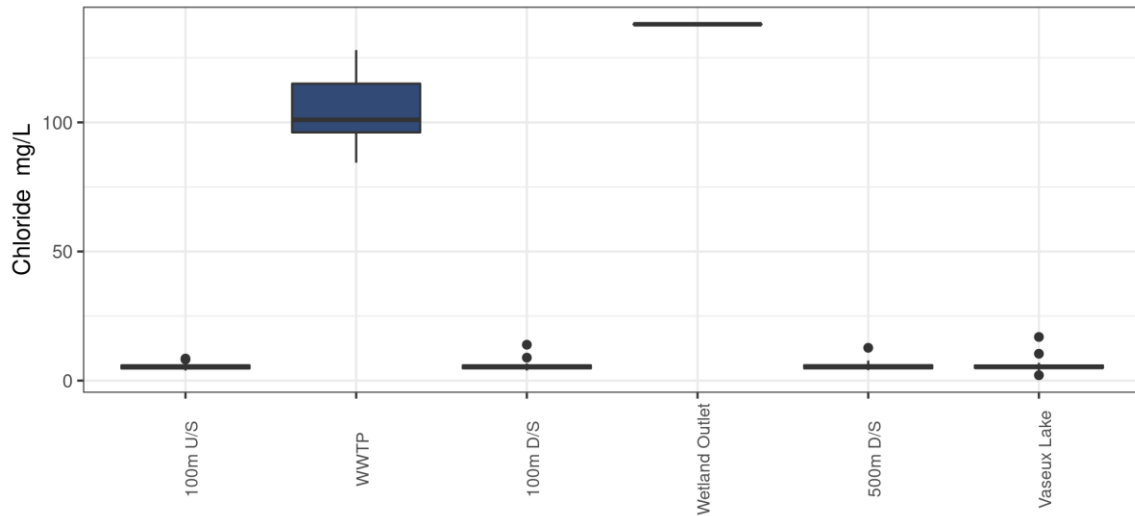


Figure 21: Chloride concentration at all sample sites from 2013-2021

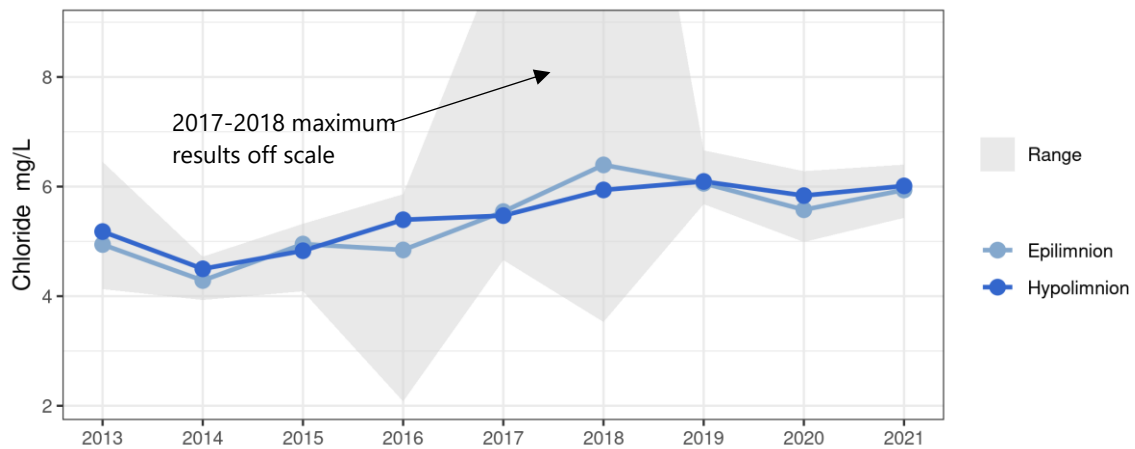


Figure 22: Chloride concentration in Vaseux Lake, 2013-2021

Metals

Beginning in 2017, the full suite of total metals was measured each month. Metals specified in the Permit included the cations calcium (Ca^{+2}), magnesium (Mg^{+2}), potassium (K^+), and sodium (Na^+ , Appendix 5). These four metals exhibited a common pattern, where they:

- a. increase initially during early freshet as road salt washed into the lake
- b. decrease during spring freshet as large Okanagan River flows diluted Vaseux Lake
- c. increase between July and August sample dates with evaporative accumulation
- d. return to baseline values in the fall (Figure 23)

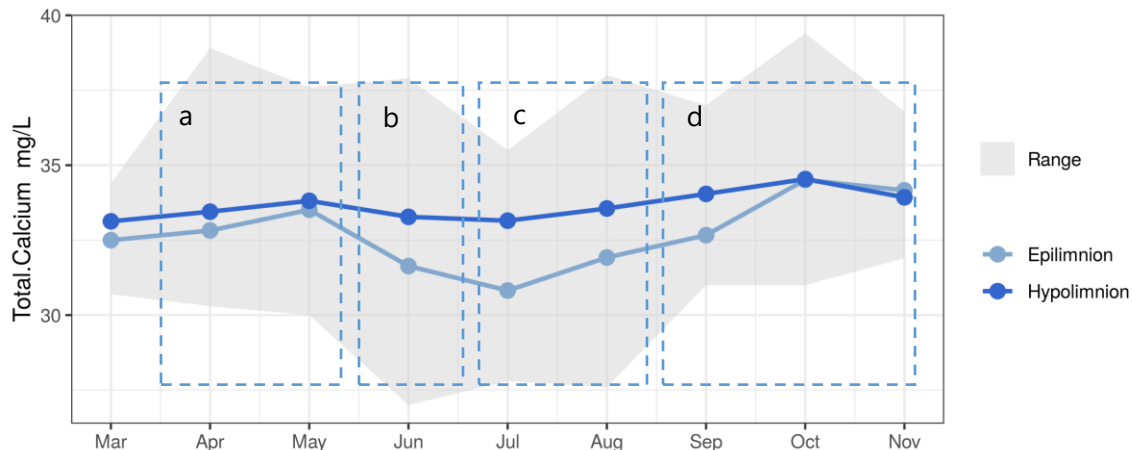


Figure 23: Monthly calcium concentrations in Vaseux Lake, 2013-2021

There were no exceedances of aquatic life MAC guidelines for any metal in Vaseux Lake samples during 2021.

2.3.3 Algae

Vaseux Lake supports large algae populations. Chlorophyll-a (chl-a), the primary photosynthetic pigment in many types of algae, is used as a measure of algae concentration. During 2021, there was a maximum chl-a concentration of $2.44 \mu\text{g/L}$ on Nov 11 and a minimum chl-a concentration of $0.70 \mu\text{g/L}$ during the clear summer phase (Figure 24, Figure 27). Algae and chl-a concentrations decline after the lake stratifies each year (Figure 24). Epilimnion chl-a averaged $1.63 \pm 0.549 \mu\text{g/L}$ during 2021 and $1.96 \pm 1.27 \mu\text{g/L}$ from 2013-2021. There was a long-term declining trend in chl-a in the hypolimnion of Vaseux Lake from 2013-2021 (Mann-Kendall, $p=0.005$) while epilimnion chl-a also exhibited a declining trend in spring maximum chl-a as measured in March and April (Mann-Kendall, $p=0.01$).

Each year, nutrients become depleted from the water above the thermocline and cannot be replenished from deep-water nutrients until the lake mixes again in the fall. This results in lower summer algae production than would occur if the lake periodically mixed during the summer. This period of low algae production is called the summer clear phase (Figure 24, Figure 26).

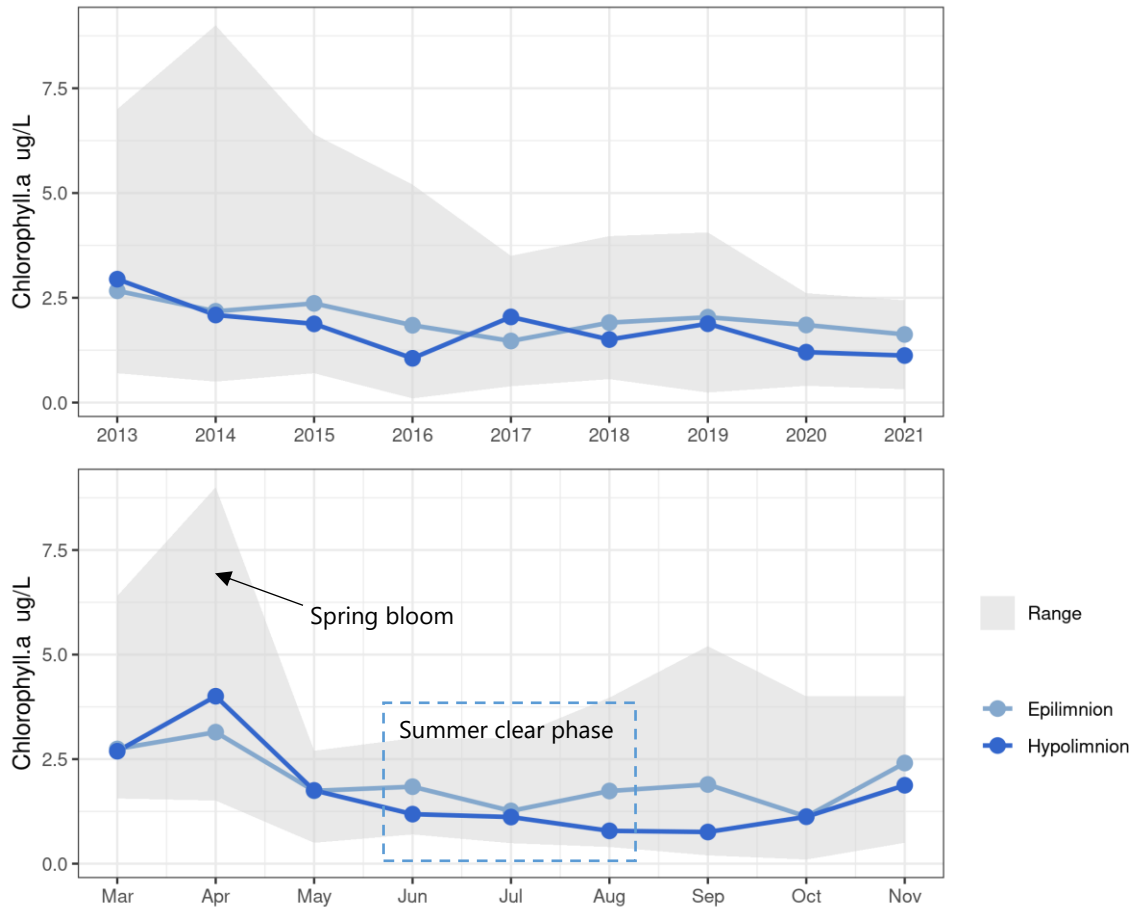


Figure 24: Chlorophyll-a concentration in Vaseux Lake epilimnion and hypolimnion water samples over time (top) and by month (bottom), 2013-2021

As it has in the past, diatoms and cyanobacteria dominated the phytoplankton at all depths in Vaseux Lake during 2021 (Figure 27). Following ice-off, cyanobacteria densities reached 2750 cells/mL in the surface water and 1500 cells/mL at 10 m (March 12). The 2021 spring diatom bloom was smaller than 2020's diatom bloom (May 10, 2021 = 2560 cells/mL at 20 m). Another diatom bloom occurred in November that was larger than the spring bloom with densities of 5500 cells/mL and 6140 cells/mL in the surface and 10 m sample respectively. This was the highest recorded diatom density at 10 m to date. This was likely related to the early fall overturn that brought nutrients from the anoxic hypolimnion to the surface where they fueled algae production.

Vaseux supports several potentially toxic cyanobacteria including *Planktothrix* spp. and *Lyngbya* spp. and these were the dominant cyanobacteria in Vaseux in 2013-2021 (Figure 25). During 2021 the dominant toxic cyanobacteria were *Lyngbya* spp. and *Anacystis* spp. Vaseux Lake cyanobacteria counts exceeded the Alert Level 1 drinking water threshold (2000 cells/mL) in only 2 of 27 samples during 2021 (Figure 27; WHO, 1999). To date, 2016 and 2017 were the only years during this sampling program when this threshold was not exceeded.

There was a declining trend in cyanobacteria concentrations in Vaseux from 2013-2017 but productivity increased during 2018-2020 with 2020-2021 again having a downward trend in cyanobacteria densities (Mann-Kendall, $p=0.006$ at 0m). The cause of the declining trend was likely related to drier summer weather and the associated lower nutrient concentrations in Okanagan River inflows. Vaseux Lake is not used as a source of drinking water and exceedances do not require action on the part of RDOS.

Trends identified to date appear to be climate-driven and there were no indications of nutrient enrichment or other impacts by the WWTP on Vaseux Lake’s algae population from the 2013–2021 data.

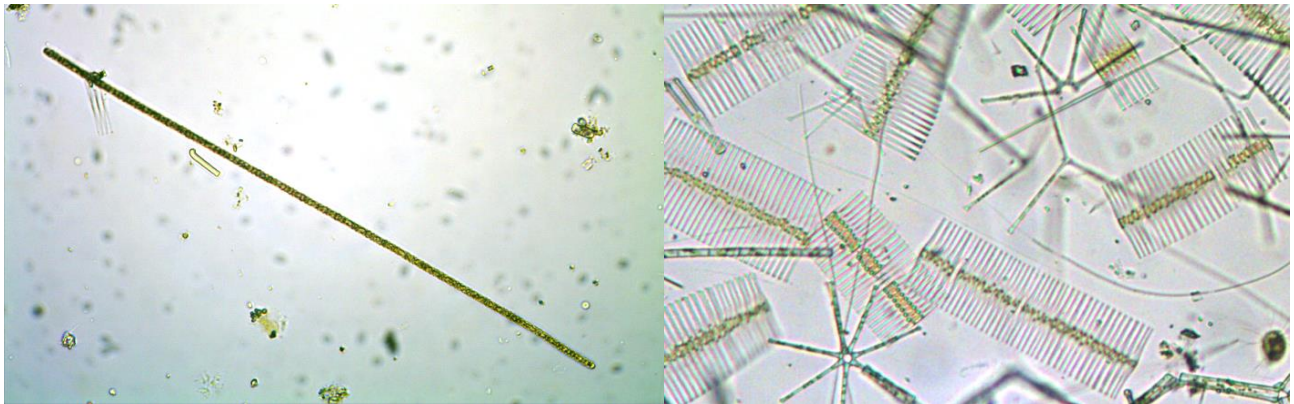


Figure 25: *Planktothrix* spp. (left) and various common diatoms (right) from Vaseux Lake algae samples

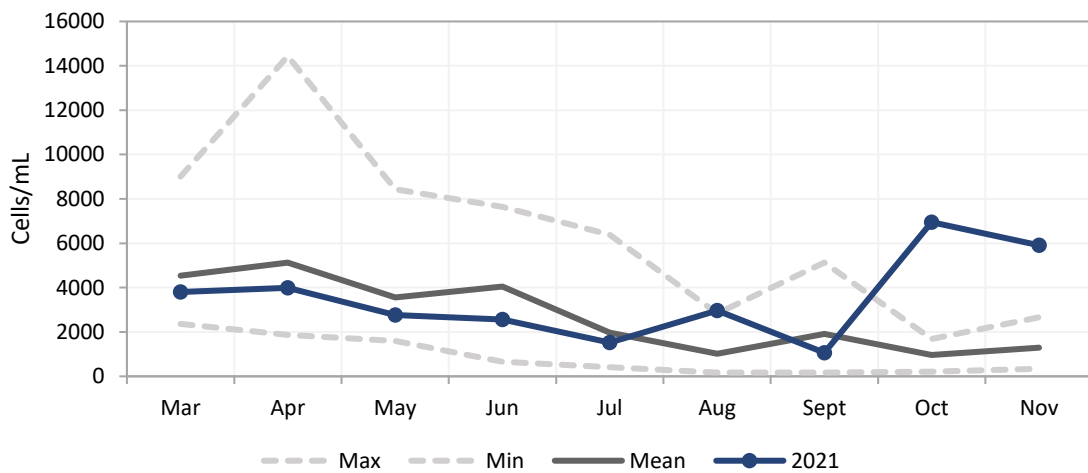


Figure 26: Vaseux Lake surface monthly total algae counts during 2021 compared to previous years



Figure 27: Vaseux Lake algae counts for three depths, 2013-2021

3.0 Conclusions

The WWTP contributed an additional 516 kg of nitrogen and 22 kg of phosphorus to Okanagan River in 2021. This represented a very small fraction of the total load entering Vaseux Lake. The vast majority of the annual nutrient loading comes from Okanagan River and internal nutrient recycling within the anoxic zone of Vaseux Lake. Most parameters place Vaseux Lake in the meso-eutrophic range (highly productive), the same range as it was in the 1970's.

There were subtle but not statistically significant differences attributable to the WWTP detected within Okanagan River from 2013-2021. These include higher conductivity and chloride immediately downstream of the WWTP. While, high seasonal and interannual variability restricts the statistical confidence of this pattern both parameters were consistently higher downstream than upstream on any given sample date.

More years of study will be required to determine conclusively if there were impacts on the Okanagan River benthic invertebrate community from the WWTP, but the data to date suggest a possible small negative impact during some years.

To date, there have been no observable water quality or microflora impacts on Vaseux Lake from the release of treated effluent from the WWTP during 2013-2021.

4.0 Recommendations

We recommend that the existing sampling program be continued in 2022 as performed in 2021 with the following amendments:

- Coordinate with CARO labs to return to 0.02 mg/L as N detection limit for ammonia for Okanagan River samples

5.0 Literature Cited or Used

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6.0 Appendix 1: Statistical Methods

Statistical analyses were performed on data to support claims made throughout this report. The use of the word 'significantly' within this report signifies that the claim has stood up under statistical analysis. Unless otherwise stated, all statistical analyses were performed to a confidence of greater than or equal to 95% ($p \leq 0.05$). The \pm symbol indicates the standard deviation throughout this report.

Water quality data often contains non-detect values for many parameters. Non-detect values were handled using an algorithm that used the following approach:

- If values flanking the non-detectable value are also non-detectable, then 0 is substituted and noted
- If values flanking the non-detectable value include a detectable value, then $\frac{1}{2}$ of the detection limit is substituted and noted

A more detailed breakdown of the data management and specific advanced statistical analysis used in the preparation of this report can be found in Appendix 1.

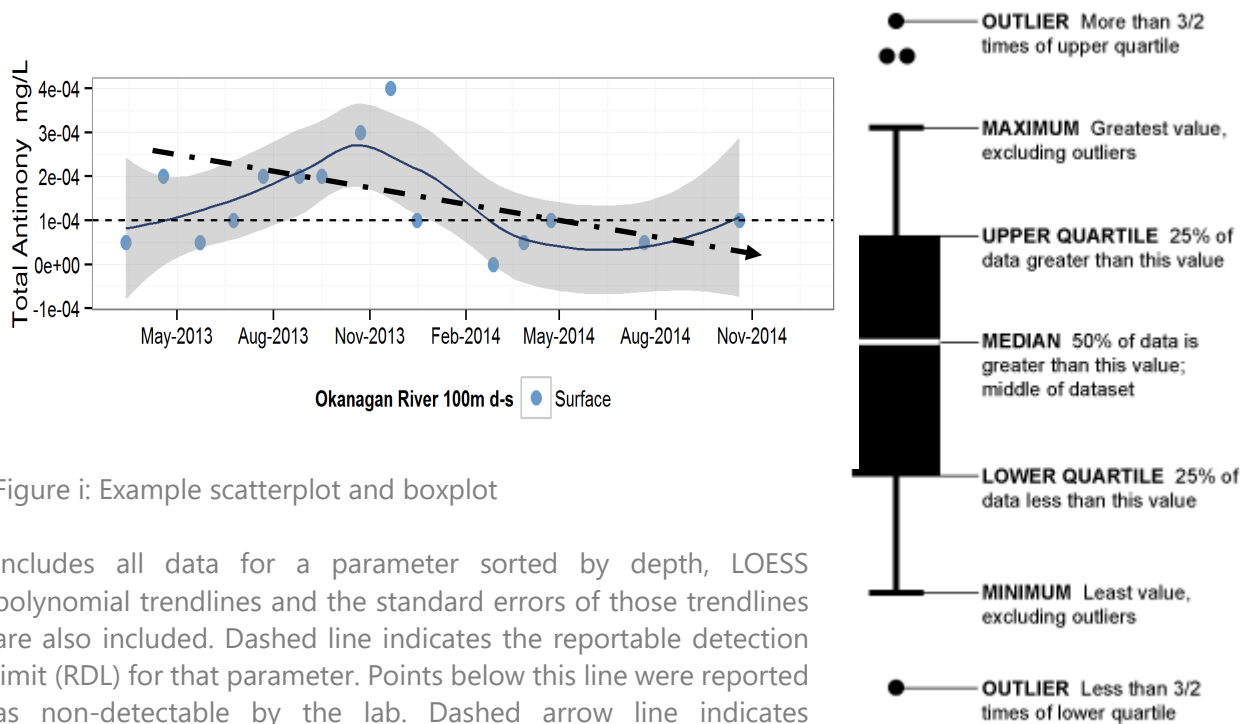
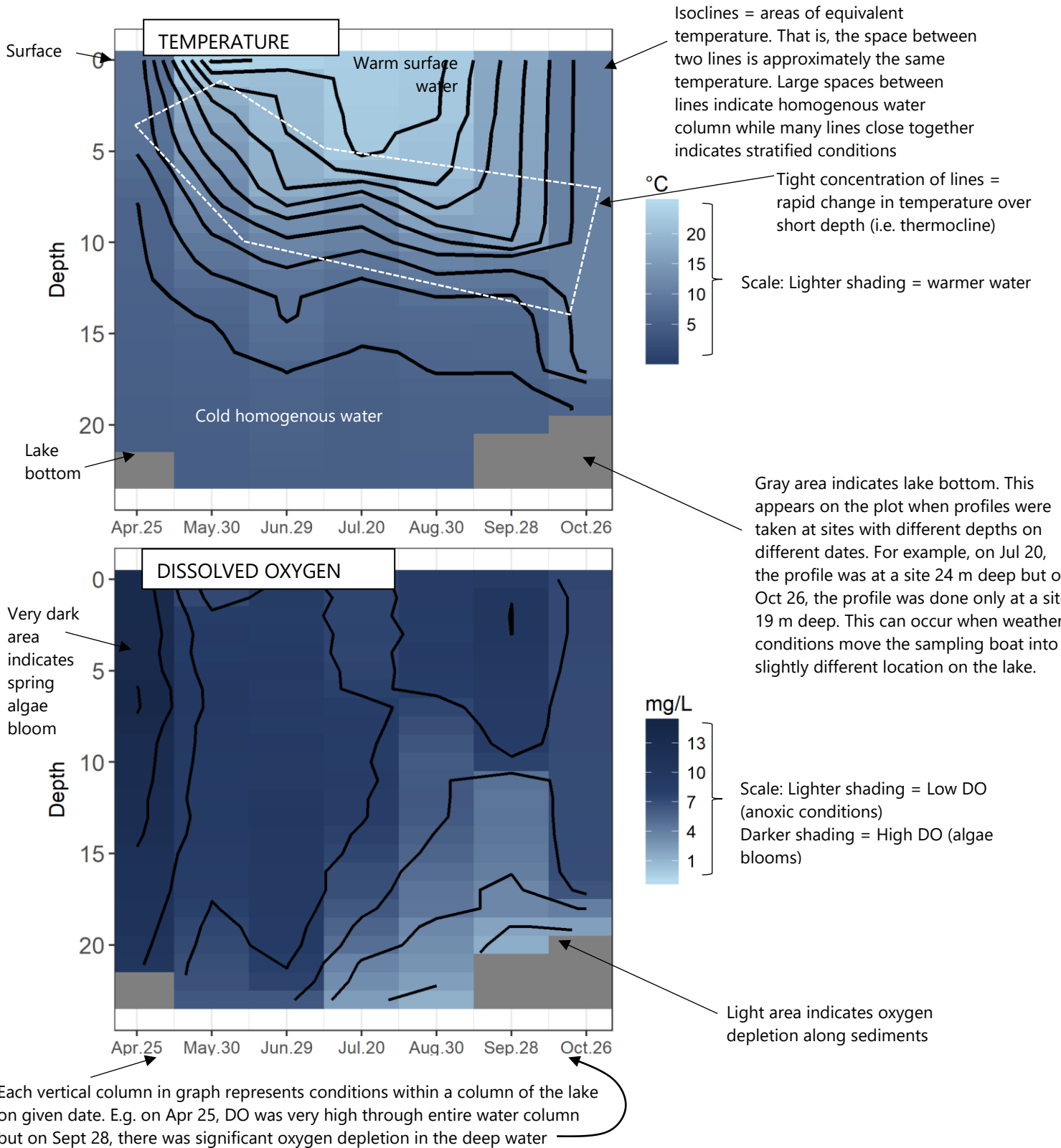


Figure i: Example scatterplot and boxplot

Includes all data for a parameter sorted by depth, LOESS polynomial trendlines and the standard errors of those trendlines are also included. Dashed line indicates the reportable detection limit (RDL) for that parameter. Points below this line were reported as non-detectable by the lab. Dashed arrow line indicates generalized trend pattern (not mathematical) and is exaggerated for ease of visual reading.

Temperature/DO Profile Plot Interpretation

Temperature and dissolved oxygen profiles were routinely collected as part of this study. An example of a temperature graph and dissolved oxygen graph, descriptions of their key features, and how to read them are presented here.



Many water parameters are present at or below the detectable limit in the natural environment and in the data reported here. A variety of techniques exist for dealing with non-detection data through estimating values prior to subsequent analyses. Techniques for handling non-detection values must be considered carefully, as they can influence interpretations of subsequent analyses. For instance, if many non-detectable values occur in a data set, substituting all non-detectable values with 0 is likely to underestimate the true value, and does not accurately reflect the variability that occurs in a sampled parameter. Treating the non-detectable values as a NULL or as if they were not sampled overestimates the actual value because too much emphasis is given to detected values. Likewise, substituting all non-detectable values with $\frac{1}{2}$ of the detection limit frequently causes over-estimation of true values, particularly in older data with higher detection limits. This project applies the $\frac{1}{2}$ detection limit approach while also plotting the detection limit so it can be readily visualized over time, allowing assessment of if detection limit is skewing data.

Mann-Kendall Trend Analysis

Mann-Kendall trend tests (implemented in the “Kendall” package in R; (McLeod 2013)) were used to identify and assess the direction and statistical significance of trends in water quality measurements over time. The Mann-Kendall test is a non-parametric statistical test, which, unlike traditional regression analysis, does not assume normally distributed data (Hipel and McLeod 2005). This is a key attribute of this test as water quality data are typically not normally distributed, with many low and fewer high values. In cases where patterns in water quality are likely to differ markedly among months (e.g., due to seasonal hydrological patterns), seasonal Mann-Kendall tests can be used in the future to compare time series among the same months in different years in order to better determine overarching trends.

The Mann-Kendall trend test provides a p-value analogous to that provided by simple linear regression, from which statistical significance is determined at an alpha level of 0.05. The relative strength and direction of trends is measured through a second test statistic, Kendall’s tau (T) rank correlation coefficient. Tau ranges from -1 to 1 with negative and positive values indicating negative and positive correlations (trends) respectively, and the departure from zero indicating the relative strength of the trend (Helsel and Hirsch 2002).

Kruskal-Wallis Test of Difference

The Kruskal–Wallis one-way analysis of variance by ranks is a non-parametric method for testing whether samples originate from the same distribution. It is used for comparing more than two samples that are independent, or not related. It is the non-parametric equivalent of the more traditional ANOVA statistical test. The calculation produces a p-value from which statistical significance is determined (Spurrier, 2003).

7.0 Appendix 2: Loading Estimates for 2021

OK River	Total OK River (kg)	Total WWTP (kg)	Internal Loading Estimates†	Total Mass (kg)	% WWTP	%River	%Internal Load	Total not WWTP
Discharge	461,439,419 m ³	181,707 m ³		461,621,125 m ³	0.04%	100.0%	0.0%	100.0%
Chloride	2,669,958	7,335		2,677,293	0.27%	99.7%	0.0%	99.7%
Ammonia	11,536	74		11,610	0.64%	99.4%	0.0%	99.4%
Nitrate	*	235		*	*	*	*	*
Nitrite	*	8		*	*	*	*	*
TKN	114,646	280		114,926	0.24%	99.8%	0.0%	99.8%
TP	6,387	22	3,378	9,786	0.34%	65.3%	34.5%	99.8%
TDP	3,056	12	1,937	5,004	0.39%	61.1%	38.7%	99.8%
Orthophosphate	1,154	3	797	1,954	0.24%	59.0%	40.8%	99.9%
Nitrate + Nitrite	*	243	5,192	*	*	*	*	*
TN	114,971	516	17,126	132,613	0.45%	86.7%	12.9%	99.6%

* All values below detection in Okanagan River, calculating loads is not possible

† Internal loading is based on 2019 Vaseux Lake Land Use Study (Larratt and Self, 2019)

8.0 Appendix 3: 2018 Extreme Weather and Flooding Events

Record flooding in 2017 was followed by the intense 2018 freshet that caused flooding and slope failures throughout the Okanagan region. Shuttleworth Creek flows into Okanagan River upstream of the WWTP at Okanagan Falls and has a documented history of watershed failures (Larratt and Self, 2019). On May 10 2018, there was a major failure on Shuttleworth Ck. upstream of Okanagan Falls that carried a tremendous amount of material into the Okanagan River and Vaseux Lake (Figure 28). Water clarity throughout Vaseux Lake was reduced to near zero (0.1 m Secchi) on May 11 and remained below average throughout the 2018 growing season (Figure 17). There was also flooding around Green Lake that required water to be pumped into Okanagan River upstream of Vaseux Lake. The net result of the 2018 flooding was lower water quality in Vaseux Lake during 2018, with poorer water clarity and greater algae production (Figure 27).



Figure 28: Impacts of May 10, 2018 watershed failure on Shuttleworth Creek (Clockwise from top left: Shuttleworth Creek entering Okanagan River; Vaseux Lake completely muddy; water clarity in Vaseux Lake; Shuttleworth Creek upstream of Okanagan River with debris strewn about)

9.0 Appendix 4: Abbreviations & Terms

Entities

CBCCB=Canada-British Columbia Consultative Board
 IHA = Interior Health Authority
 LAC = Larratt Aquatic Consulting
 MFLNRORD = Ministry of Forests, Lands, and Natural Resources Operations and Rural Development
 ENV = Ministry of Environment
 MoT = Ministry of Transportation and Infrastructure
 RDOS = Regional District of Okanagan-Similkameen
 WHO = World Health Organization

Technical Phrases, Regulations

BCWQ = BC Water Quality
 BMP = Best Management Practices
 CDWG = Canadian Drinking Water Guidelines
 OCP =Official Community Plan
 RDL = Reportable Detection Limit
 SCADA =Supervisory Control And Data Acquisition (system)
 WWTP = Wastewater Treatment Plant

Definitions

Term	Definition
Algae bloom	A superabundant growth of algae
Anaerobic/anoxic	Devoid of oxygen
Benthic	Organisms that dwell in or are associated with the sediments
Bioavailable	Available for use by plants or animals
Cyanobacteria	Bacteria-like algae having cyanochrome as the main photosynthetic pigment
Diatoms	Algae that have hard, silica-based "shells" frustules
Fall overturn	Surface waters cool and sink, until a fall storm mixes the water column
Eutrophic	Nutrient-rich, biologically productive water body
Green algae	A large family of algae with chlorophyll as the main photosynthetic pigment
Nutrient limitation	A nutrient will limit or control the potential growth of organisms e.g. P or N
Limnology	The study of the physical, chemical, and biological aspects of freshwater
Loading	(Nutrient) loading = nutrient concentration x water volume
Microflora	The sum of algae, bacteria, fungi, <i>Actinomyces</i> , etc., in water or biofilms
Phytoplankton	Algae that float, drift or swim in water columns of reservoirs and lakes
Plankton	Those organisms that float or swim in water
Residence time	Time for a parcel of water to pass through a reservoir or lake (flushing time)
Secchi depth	Depth where a 20 cm secchi disk can be seen; measures water transparency
Thermocline	The lake zone of greatest change in water temperature with depth (> 1°C/m); it separates the surface water (epilimnion) from the cold hypolimnion below
Zooplankton	Minute animals that graze algae, bacteria and detritus in water bodies

Lake Classification by Trophic Status Indicators

Trophic Status	chlorophyll-a ug/L	Total P ug/L	Total N ug/L	Secchi disc m	primary production mg C/m ² /day
Oligotrophic	0 – 2	1 – 10	<100	> 6	50- 300
Mesotrophic	2 – 5	10 – 20	100 – 500	3 – 6	250 – 1000
Eutrophic	>5	> 20	500-1000	< 3	>1000

Nutrient Balance Definitions for Microflora (Dissolved Inorganic N : Dissolved Inorganic P)

Phosphorus Limitation	Co-Limitation of N and P	Nitrogen Limitation
>15 : 1	<15 : 1 – 5 : 1	5 : 1 or less

Nordin,1985

10.0 Appendix 5: Conditions of Permit

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- (d) Cobalt, mg/kg;
- (e) Copper, mg/kg;
- (f) Lead, mg/kg;
- (g) Mercury, mg/kg;
- (h) Molybdenum, mg/kg;
- (i) Nickel, mg/kg;
- (j) Selenium, mg/kg;
- (k) Zinc, mg/kg;

- 4.4.3** Install and maintain a system for measuring and recording the volumes of sludge produced, the location where the sludge was discharged, and the amount of sludge discharged at each location.

4.5 Groundwater and Spray Irrigation Monitoring Program

The Regional District must have a Qualified Professional assess and develop an irrigation plan for any and all sites that utilize reclaimed water for irrigation purposes. The irrigation plan must clearly document appropriate agronomic loading rates for each site. Each site and irrigation plan should be reassessed every five years or whenever major changes to the site occur and must include auditing of irrigation duration and application rates. The first such evaluation is required within two years of the issuance of this Operational Certificate.

4.6 Surface Water Impact Sampling and Monitoring Program

The Regional District is required to undertake Okanagan River and Vaseux Lake sampling and monitoring as specified below.

4.6.1 Sampling Sites

A surface water impact monitoring program is required on the Okanagan River and Vaseux Lake. The monitoring program, as a minimum, must consist of one set of samples taken monthly at hydrologically appropriate locations upstream and downstream of the effluent diffuser as follows. Site locations and sampling procedures are to be approved in writing, by the Director.

Okanagan River sites

- 1) Upstream site – 50 metres or less upstream of the weir adjacent

Date issued: May 6, 2013



Sajid A. Barlas, Ph.D., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Okanagan

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Operational Certificate Number: 106555

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- to the AWWTP;
- 2) Edge of initial dilution zone (IDZ) – 100 metres downstream of the diffuser;
 - 3) Downstream of IDZ – 500 metres downstream of diffuser; and
 - 4) Downstream of Vaseux Lake

Vaseux Lake site

Central deep location (EMS#220331: site co-ordinates 49.300000, 119.533300)

4.6.2 Analyses

Obtain analyses of the Okanagan River sites samples for the following:

Parameter	Frequency	Type
temperature	monthly	meter
dissolved oxygen	monthly	meter
specific conductivity	monthly	meter
pH	monthly	meter
total suspended solids	monthly	grab
ions (hardness, Cl, SO ₄ , Na, K, Mg)	monthly	grab
nitrogen, (total N, TKN, organic N, nitrate, nitrite, ammonia)	monthly	grab
phosphorus (total P, dissolved P, ortho-phosphate)	monthly	grab
microbiological (October – April)	monthly	grab
microbiological (May – September)	weekly for sites 1, 2 and 3; monthly for site 4	grab
benthic macro-invertebrates (if suitable habitat is available)	annually (late summer to early fall)	follow Environment Canada CABIN protocol

Date issued: May 6, 2013



Sajid A. Barlas, Ph.D., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Okanagan

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Obtain analyses of the Vaseux Lake site samples for the following:

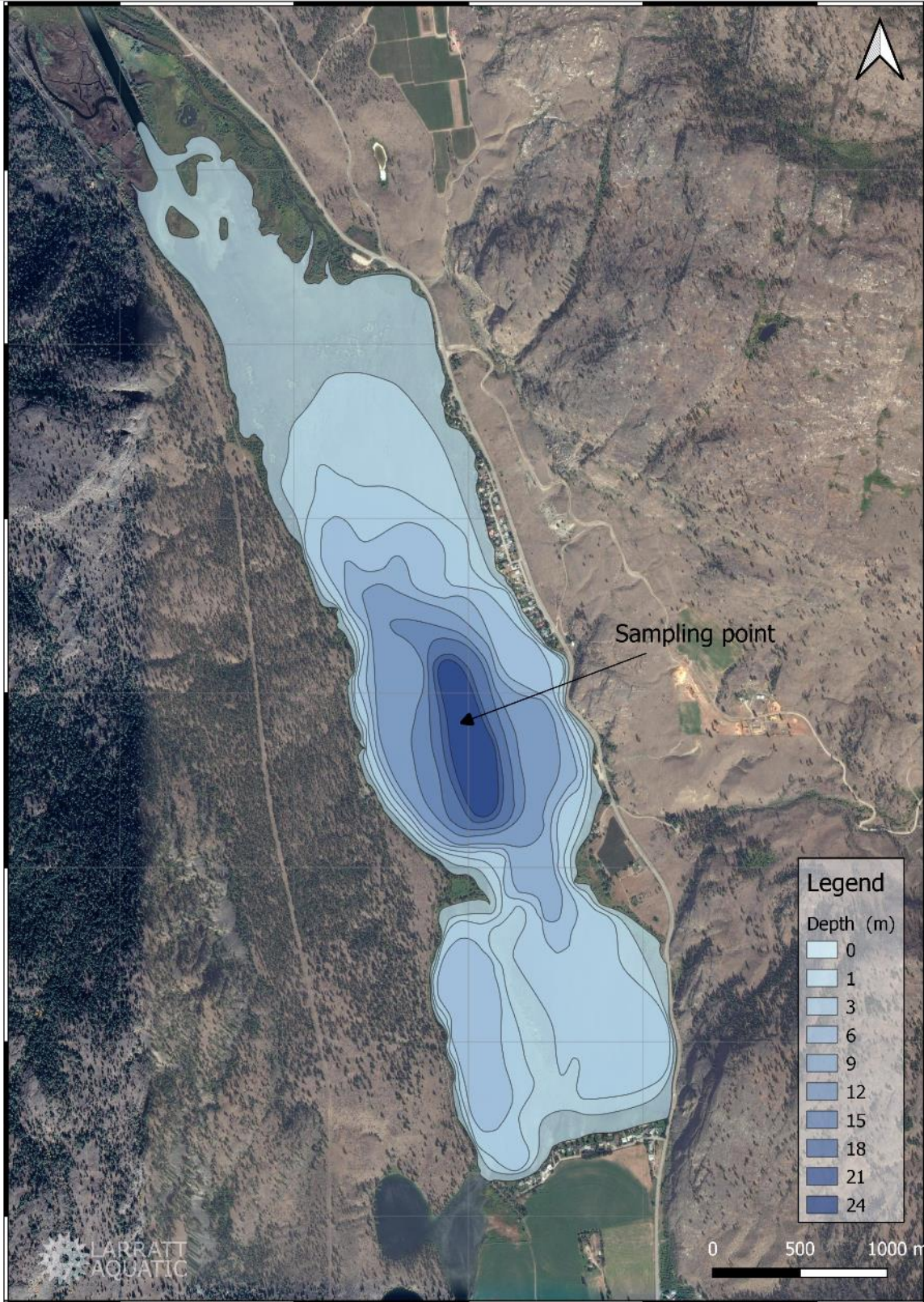
Parameter	Frequency	Type	Sampling Depths		
			Epilimnion	Hypolimnion	Vertical Profile
temperature	monthly (March (or ice off) to November)	meter	n/a	n/a	every 2m (surface to bottom)
dissolved oxygen	monthly (March (or ice off) to November)	meter	n/a	n/a	every 2m (surface to bottom)
specific conductivity	monthly (March (or ice off) to November)	meter	n/a	n/a	every 2m (surface to bottom)
pH	monthly (March (or ice off) to November)	meter	n/a	n/a	every 2m (surface to bottom)
ions (hardness, Cl, SO ₄ , Na, K, Mg)	monthly (March (or ice off) to November)	grab	1, 5, 10 m composite	20, 22, 24m composite	n/a
nitrogen, (total N, TKN, organic N, nitrate, nitrite, ammonia)	monthly (March (or ice off) to November)	grab	1, 5, 10 m composite	20, 22, 24m composite	n/a
phosphorus (total P, dissolved P, ortho-phosphate)	monthly (March (or ice off) to November)	grab	1, 5, 10 m composite	20, 22, 24m composite	n/a
chlorophyll-A	monthly (March (or ice off) to November)	grab	1, 5, 10 m composite (2 x 1 litre replicate)	20, 22, 24m composite (2 x 1 litre replicate)	n/a
secchi depth (water clarity)	monthly (March (or ice off) to November)	secchi disc	at surface	n/a	n/a

Date issued: May 6, 2013



Sajid A. Barlas, Ph.D., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Okanagan

11.0 Appendix 6: Bathymetry of Vaseux Lake



Note: Depth isolines are in 3 m increments from 0m (shoreline) to 24m (deepest basin); Modified from: Sharphooks, 2010

12.0 Appendix 7: Methodology

12.1.1 Wastewater Treatment Plant

RDOS staff sampled the treated effluent weekly before it reached Okanagan River. pH and temperature were measured continuously using a HACH Digital Peek probe located within the effluent channel. Other parameters were sampled on weekly, monthly, or quarterly schedules. All samples were sent to CARO Analytical in Kelowna for water chemistry analysis.

12.1.2 Okanagan River Channel

RDOS staff sampled Okanagan River at three sites: 100 m upstream, 100 m downstream, and 500 m downstream of the WWTP. Samples were taken 4 m from the shore of the river channel using a fiberglass pole sampler. Samples were collected from approximately 0.5 m below the surface of the river. All samples were sent to CARO Analytical in Kelowna for water chemistry analysis.

At the same time, field measurements were taken using a YSI Pro Plus multi-meter. Field readings measured pH, dissolved oxygen (DO), oxidative reductive potential (ORP), conductivity, total dissolved solids (TDS), and temperature. Turbidity was also measured in the field. Instruments were calibrated prior to each sampling occasion.

Invertebrates were sampled from the sediment within the river channel in October by LAC staff. The samples were collected using an Ekman Dredge sampler from the top few centimeters of sediment. Three to five sub-samples were combined in each of three samples and delivered to Cordillera Consulting, Summerland for identification and enumeration.

12.1.3

12.1.4 Vaseux Lake

Larratt Aquatic Consulting (LAC) was contracted to perform monthly sampling on Vaseux Lake from March to November in 2019. All samples were taken from the same location in the center of the deepest part of Vaseux Lake (Figure 1, Appendix 6). Three water samples were taken from the epilimnion at 1, 5, and 10 m and combined into a single composite sample. Likewise, samples from 20, 22, and 24 m were combined into a composite sample that represented the water quality in the hypolimnion of the lake. These samples were taken to CARO Analytical in Kelowna for water chemistry analysis on the same day as collection.

Field temperature, DO, TDS, and conductivity were taken on each trip with a Hanna HI 9828 or YSI Pro Solo multimeter. The probe was lowered from the surface to the sediments and readings were taken at one-meter intervals. These data were used to build profiles of Vaseux Lake over 2019 (Figure 16).

LAC also sampled Vaseux Lake for algae at 0, 10, and 20 m. The algae contents collected from 1-liter sample volumes were identified to the lowest possible taxonomic level and enumerated in cells/mL. An 80 µm plankton net was pulled vertically from 10 m depth to the water surface to collect a qualitative sample of the type and relative abundance of the algae and zooplankton species present in the epilimnion. Samples were analyzed by LAC staff using light microscopy.

13.0 Appendix 8: Cordillera Consulting Results Report



Project: Vaseux Lake 2021

RDSO/Similkameen

Taxonomist: Scott Finlayson

scottfinlayson@cordilleraconsulting.ca

250-494-7553

Site:	100m u/s	100m ds	500m ds
Sample:	100m u/s	100m ds	500m ds
Sample Collection Date:	07-Oct-21	07-Oct-21	07-Oct-21
CC#:	CC221714	CC221715	CC221716

Richness Measures

Species Richness	29	24	25
EPT Richness	11	9	6
Ephemeroptera Richness	4	5	3
Plecoptera Richness	2		
Trichoptera Richness	5	4	3
Chironomidae Richness	8	8	9
Oligochaeta Richness	1	1	1
Non-Chiro. Non-Olig. Richness			

Abundance Measures

Corrected Abundance	465	1292	443
EPT Abundance	168	128	33

Dominance Measures

1st Dominant Taxon	Orthocladius complex	Hygrobates	Thienemannimyia group
1st Dominant Abundance	107	267	111
2nd Dominant Taxon	Hydropsyche	Orthocladius complex	Nanocladius
2nd Dominant Abundance	82	243	47
3rd Dominant Taxon	Zavrelimyia	Oribatida	Orthocladius complex
3rd Dominant Abundance	45	208	47

% 1 Dominant Taxon	23.02%	20.67%	25.06%
% 2 Dominant Taxon	17.55%	18.77%	10.58%
% 3 Dominant Taxon	9.67%	16.10%	10.58%
Percent Dominance	50.25%	55.54%	46.22%

Community Composition

% Ephemeroptera	10.54%	7.43%	3.16%
% Plecoptera	0.43%		
% Trichoptera	25.16%	2.48%	4.29%
% EPT	36.13%	9.91%	7.45%
% Diptera	51.40%	43.03%	64.56%
% Oligochaeta	1.51%	1.24%	2.71%
% Baetidae	0.65%	0.97%	2.01%
% Chironomidae	49.25%	43.03%	57.56%
% Odonata			0.23%

Functional Group Composition

% Predators	21.07%	55.50%	42.44%
% Shredder-Herbivores	0.43%		
% Collector-Gatherers	47.53%	41.08%	47.09%
% Scrapers	5.26%		0.23%
% Macrophyte-Herbivore			
% Collector-Filterer	25.25%	3.11%	9.57%
% Omnivore	0.23%	0.31%	0.68%
% Parasite			
% Piercer-Herbivore	0.23%		
% Gatherer			
% Unclassified			

Functional Group Richness

Predators Richness	7	5	9
Shredder-Herbivores Richness	2		
Collector-Gatherers Richness	12	14	12
Scrapers Richness	1		1
MH Richness			
CF Richness	5	4	2
OM Richness	1	1	1
PA Richness			
Piercer-Herbivore Richness	1		
Gatherer Richness			
Unclassified			

EPA Functional Group Composition

% Predators	
% Parasite	

% Collector-Gatherers
% Collector-Filterer
% Macrophyte-Herbivore
% Xylophage
% Scraper
% Shredder
% Piercer
% Omnivore
% Unclassified

EPA Functional Group Richness

Predators
Parasite
Collector-Gatherers
Collector-Filterer
Macrophyte-Herbivore
Xylophage
Scraper
Shredder
Piercer
Omnivore
Unclassified

SAFIT Functional Group Composition

% Predators
% Parasite
% Collector-Gatherers
% Collector-Filterer
% Macrophyte-Herbivore
% Periphyton-Herbivore
% Scraper
% Shredder
% Omnivore
% Unclassified

SAFIT Functional Group Richness

Predators
Parasite
Collector-Gatherers
Collector-Filterer
Macrophyte-Herbivore
Periphyton-Herbivore
Scraper
Shredder
Omnivore

Unclassified

EPA Habitat Composition

- % Clinger
- % Climber
- % Sprawler
- % Burrower
- % Swimmer
- % Diver
- % Skater

EPA Habitat Richness

- Clinger
- Climber
- Sprawler
- Burrower
- Swimmer
- Diver
- Skater

Voltinism Composition

% Univoltine	18.23%	0.93%	0.90%
% Semivoltine	0.43%	0.62%	
% Multivoltine	2.58%	6.21%	14.67%

Voltinism Richness

Univoltine	4	2	2
Semivoltine	2	1	
Multivoltine	2	2	2

Diversity/Evenness Measures

Shannon-Weiner H' (log 10)	1.11	1.05	1.11
Shannon-Weiner H' (log 2)	3.69	3.50	3.67
Shannon-Weiner H' (log e)	2.56	2.43	2.54
Simpson's Index (D)	0.11	0.13	0.11
Simpson's Index of Diversity (1 - D)	0.89	0.87	0.89
Simpson's Reciprocal Index (1/D)	8.85	7.93	8.99

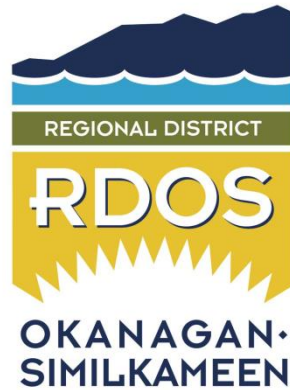
Biotic Indices

Hilsenhoff Biotic Index	5.08	5.82	5.04
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APPENDIX V

Okanagan Falls Wastewater Collection and Treatment System Emergency Response and Contingency Plan

June 2021



REGIONAL DISTRICT OF
OKANAGAN-SIMILKAMEEN

**OKANAGAN FALLS WASTEWATER
COLLECTION AND TREATMENT SYSTEM**

**EMERGENCY RESPONSE AND
CONTINGENCY PLAN**

JUNE, 2021

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REVISIONS AND DISTRIBUTION LIST

This Emergency Response and Contingency Plan (ERCP) was created by the Regional District of Okanagan-Similkameen (RDOS) in 2018.

Revised By:	Date
Karen Moore, Laboratory Technician	May, 2016
Rina Seppen, Utility Foreman – Wastewater	June, 2021
Liisa Bloomfield, Engineering Supervisor	July, 2017
Neil Webb, Public Works Manager	July 2018

The Regional District of Okanagan-Similkameen shall ensure the Emergency Contacts booklet (Appendix A) is verified and updated annually. Annually, all relevant Qualified Personnel shall be given a refresher briefing this Plan.

The Emergency Response Plan is to be distributed to the following:

Name and Address	No. of Copies
All RDOS Water and Wastewater Utilities Staff	10
Emergency Services Supervisor Regional District of Okanagan-Similkameen Main Office, 101 Martin St. Penticton, B.C. V2A 5J9	1
Okanagan Falls Wastewater Treatment Plant Regional District of Okanagan-Similkameen 330 Rail Road. Okanagan Falls, B.C. V0H 1R0	1 (Field Copy)
Okanagan Falls Volunteer Fire Department	1

1 INTRODUCTION

The British Columbia *Environmental Management Act* and supporting *Regulation* requires all authorized dischargers of treated effluent to have an Emergency Response and Contingency Plan (ERCP) that will form the basis for a response to an emergency which may present a threat to the health and safety of the people at the facility or downstream of the system. This plan has been developed for the Regional District of Okanagan-Similkameen (RDOS) to facilitate an appropriate response to a set of given emergency situations.

2 SYSTEM OVERVIEW

Located within the boundary of Okanagan Falls BC, the wastewater infrastructure owned and operated by the RDOS consists of the following facilities:

- Underground gravity sanitary collection system of approximately 22 kilometers.
- 3, dual pump sanitary lift stations located along the shore of Skaha Lake
- 1, triple pump sanitary lift station located at Cedar St to a force main built 2013
- Level IV BNR wastewater treatment plant built 2013
- 0.94 Hectare Wetland built 2020

Sewage flows through a series of collections systems. The northern most point is located along Skaha lakeshore and gravity lines flow to Lift Station #1 located at 350 Eastside Rd. There are two 3 hp pumps located in the wetwell and that lift's the wastewater to the next section of the collection system. Flow is then sent to Lift Station #2 located a 496 Hody Dr, where again one of two 3 hp pumps lift the wastewater to the next section of the collection system. Flow from here enters a gravity main than flows to Lift Station #3 located at 601 Main St where one of two 5 hp pumps lift wastewater to the final station at 1440 Cedar St at the location of the old wastewater plant.

The wet well at Cedar St is equipped with two 10 hp pumps and one 5 hp pump that send raw sewage south via force main 2.3 km to the Main Wastewater plant at 300 Rail Rd.

This level IV wastewater plant was built adjacent to the Okanagan river channel at lat 49.32460 long 119.56782

Process begins with an influent channel consisting of one 2 mm fine screen which removes washed and compacted screenings to a garbage bin, to be disposed of to the landfill. The wastewater is then sent to a Primary fermenter that will hold approximately 8 days of solids for volatile fatty acid (VFA) production with the settled sludge drained to the Fermented Primary

Solids (FPS) tank. Dissolved solids overflow the weir of the Fermenter to the combined treatment unit (CTU).

There are two CTU's which may be run individually or in parallel to each other (depending on the flow to the plant and organic loading). The bioreactors within the CTU consist of 510m³ volume capacity for activated sludge divided into various process zones that remove nutrients, BOD and TDS. Also within each CTU is a secondary clarifier to settle out solids with clear effluent flowing over the weir to the tertiary treatment system. The tertiary system encompasses two filters that remove particles of 0.5 mm or more prior to UV disinfection. After UV disinfection treated effluent flows into the holding tank that overflows to either the Okanagan River Channel via 200mm pipe or can be diverted to the constructed wetland via a 150 mm pipe. The wetland outlet discharges through the same outlet to the Okanagan River channel. that Recycle water is used throughout the plant for cleaning as well as irrigation on the treatment plant grounds. Recycle water is chlorinated using a chemical dosing pump set to 0.3 ppm Cl₂.

Mixed liquor is pumped from bioreactors via Waste Activated Sludge system to a Dissolved Air Floatation Tank that thickens the sludge to 2-4% solids. Thickened sludge (TWAS) is then sent to a holding tank where it will periodically be trucked offsite to the Penticton Advanced wastewater plant. Primary solids are also removed from FPS tank and trucked to Penticton AWWTP.

The wastewater effluent discharge to the Okanagan River Channel is regulated by the Operational Certificate #106555 with requirements to report results monthly to FLNRO via the website envauthorizationsreporting@gov.bc.ca as well as quarterly to Environment Canada via the ERRIS system (Effluent Regulatory Reporting Information System)
<https://www.canada.ca/en/environment-climate-change/services/wastewater/publications/effluent-regulatory-reporting-user-guide.html>.

All information results including spills or exceedances are reported at both these regulatory bodies.

3 OPERATIONS RESPONSE PHILOSOPHY

3.1 NORMAL OPERATION AND MAINTENANCE

Normal maintenance procedures, which pose no threat to public health and safety, are to be responded to under standard operating procedures.

3.2 EMERGENCY PLANNING

The RDOS shall review the ERCP annually to develop and maintain a condition of readiness to respond to wastewater related emergencies.

3.3 EMERGENCY FIRST RESPONSE

The RDOS Wastewater System Operator(s) shall be responsible for the primary response to wastewater related emergencies and must immediately report the emergency to their supervisor and use this plan as a guide to assist in first response. The Operator shall attend the site to assess the situation.

In an emergency, the most senior staff in the vicinity shall assume the responsibility of initiating the emergency response plan. The first line management supervisor, or his/her designate, is responsible to ensure the plan is properly coordinated and implemented in a timely fashion. The supervisor is also responsible to notify the Public Works Manager or his/her delegate immediately.

In the event of an after-hours emergency – the first responder will activate the Emergency Contact List and continue through the list until another, more senior staff arrives to assume incident command responsibilities.

3.4 NOTIFICATION PROCEDURES

In the event of wastewater related emergencies, the Operator shall respond immediately to protect public health and safety and RDOS owned property and equipment.

3.4.1 Senior Staff Notification Procedure

All emergencies involving risk to both the health and safety of staff members or to the environment or the general public are reported to senior management immediately. The Public Works Manager or his/her delegate must ensure that senior management is notified immediately prior to any required public notification.

3.4.2 Public Notification Procedure

Once the Public Works Manager and senior management have been notified of an emergency, senior management in conjunction with the Regional District's communication staff will determine if notification is required to customers that may

be affected. The severity of the emergency will determine what form of notification to the public.

3.4.3 Environmental and Regulatory Notification Procedure

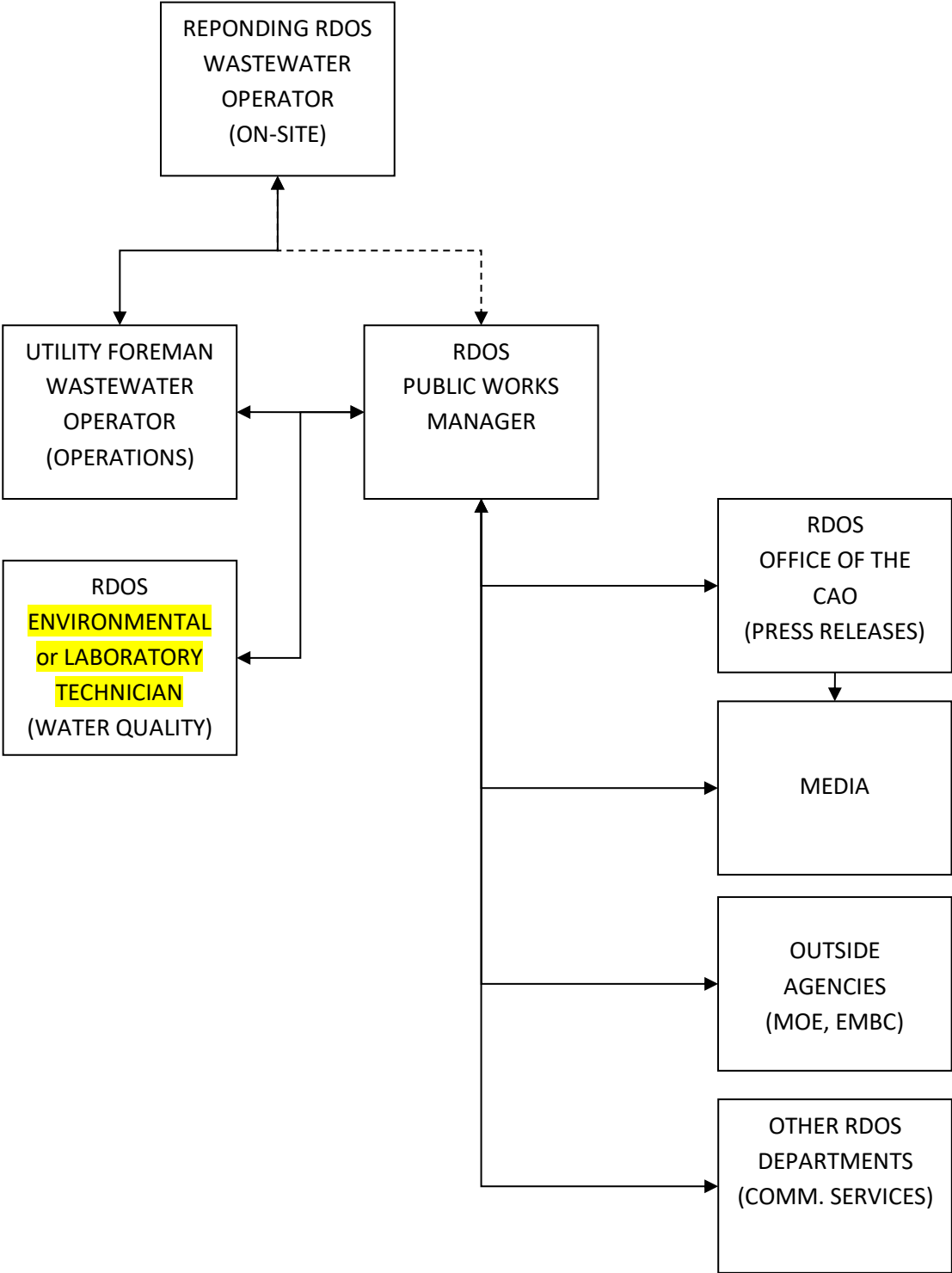
All emergencies that may have an effect on water, wastewater, drainage, solid waste or air quality are to be reported immediately to the Utilities Foreman. The Utilities Foreman will then report to the Public Works Manager. The Public Works Manager is responsible to ensure staff know and can implement the Provincial Emergency Program (PEP) first response procedure.

3.5 ENVIRONMENTAL INSURANCE REPORTING

Upon becoming aware of any situation that negatively impacts the environment as a result of RDOS operational situation, the RDOS should notify its Insurer immediately of the occurrence. As some issues are not found immediately, the RDOS's insurance provides for up to 240 hours (10 days) for the RDOS to become aware of any situations that negatively impact the environment as a result of RDOS operations.

Examples: spill of sodium hypochlorite solution, sewer overflow, etc

Typical Communications Structure



4 EMERGENCY SITUATIONS AND RESPONSES

The following section includes potential emergency scenarios identified along with the typical actions required to respond to the scenarios in an effective manner. Each scenario provides a general list of actions to be carried out immediately by the Operator to deal with specific localized emergencies as they relate to wastewater issues.

The Emergency Response Procedure for medical, fire, security, bomb threats and earthquake preparedness have been adapted from the RDOS Employee Emergency Procedures with site specific modifications to the Okanagan Falls Wastewater Treatment Facility.

These response plans only provide general guidance for responding to emergency situations. These actions and the order in which they are implemented may require adaptation in the field to facilitate an effective response to each individual emergency.

In the event of a major emergency (i.e. interface fire, MVA resulting in a fuel spill, earthquake) where other emergency situations are present, developing or have the potential to occur, the response of other RDOS Departments, levels of government and emergency response agencies and resources shall be initiated or be in place to manage the incident under the Incident Command System (ICS). Subsequent and long term responses to these larger scale emergencies will be developed by local experts such as Fire Departments, RCMP and the Emergency Management BC (EMBC) with the support of an Emergency Operations Centre (EOC).

4.1 MEDICAL

All injuries or illnesses must be reported to an immediate supervisor. Trained First Aid attendees may be called to assist in a medical emergency.

4.2 COLLAPSE OR SERIOUS INJURY

1. Contact the First Aid Attendant immediately.
2. Follow the First Aid Attendant's instructions and provide as much information as possible. Dial 911 for any serious injury, unconsciousness, etc. Stay with the person until medical help arrives.
3. Within 24 hours, ensure that your manager is informed that you have reported to the First Aid Attendant.
4. Supervisor to fill out all WCB forms if required.
5. Fill out incident report found in Appendix B.

4.3 FIRE – CONTAINED TO WWTP – REFER TO FIRE SAFETY PLAN (MAY 2016)

If you discover a fire – Alert those in the immediate area and others working at the Plant of the emergency and:

1. If trained and safe to do so, attempt to extinguish or control the fire with appropriate fire-fighting equipment.
2. If not safe to do so, or if you cannot extinguish or control the fire, alert others and leave the area and close doors to isolate the fire.
3. Dial 911 for Fire Department. State the location and nature of the emergency or have someone else do so and report back to you.
4. Evacuate the area, if able to take the IN/OUT board and proceed to your assembly area – outside the front gate at Hydro Pole.
5. Confirm that everyone has been accounted for and/or is present and uninjured.
6. Ensure that 911 has been called.
7. Await emergency services and contact supervisor.
8. The Supervisor will report any fire that may have the potential to spread to the surrounding area.
9. Fill out incident report found in Appendix B.

4.4 FIRE AFTER HOURS

The WWTP building has heat sensors that will alert the security company of any fire. The Security Company will contact emergency services as well as the operator on call.

If called to plant during after- hours:

1. The operator will attend to the WWTP and open the gate for emergency services but will not enter any building until emergency services has rendered it safe to do so.
2. The operator will contact Supervisor to report the fire.
3. The Supervisor will report any fire that may have the potential to spread to the surrounding area.
4. Fill out incident report found in Appendix B.

4.5 FIRE AT ANY LIFT STATION:

Fire at Lift stations 1, 2 or 3:

1. If trained and safe to do so, attempt to extinguish or control the fire with appropriate fire-fighting equipment.
2. If not safe to do so, or if you cannot extinguish or control the fire, alert others and leave the area and close doors to isolate the fire.
3. Call 911 and wait in a safe place for emergency services to arrive.
4. In the event of a power outage due to fire, contact Supervisor who will contact a septic hauler to remove wastewater from the lift station to avoid any interruption of service.
5. Fill out incident report found in Appendix B.

Fire at Lift Station Cedar Street:

1. If trained and safe to do so, attempt to extinguish or control the fire with appropriate fire-fighting equipment.
2. If not safe to do so, or if you cannot extinguish or control the fire, alert others and leave the area and close doors to isolate the fire.
3. Call 911 and wait in a safe place for emergency services to arrive.

4. If a power outage occurs due to fire, the emergency generator should start automatically to run the pump station. If the generator is compromised and fails to start, contact Supervisor who will contact a septic hauler to remove wastewater from the lift station to avoid any interruption of service.
5. Fill out incident report found in Appendix B

4.6 FIRE – FOREST

1. Call *5555 from a cell phone or 1-800-663-5555 to report the fire.
2. Contact Supervisor and report.
3. If the fire is close and/or threatens the roadway egress out of the plant, evacuate the facility/area – close all doors of WWTP if safe to do so – Do not lock gate in case emergency services need access
4. Move RDOS vehicles to an unaffected area, if safe to do so.
5. Remain in vehicles near the road conjunction at Alba St for access to Highway 97 until authorized to return to the treatment plant or further evacuation is required.
6. Fill out incident Report found in Appendix B

4.7 SECURITY

The Gate to the WWTP facility is to be locked at all times after hours. The WWTP building is equipped with a Security alarm that alerts a Private Security company if the plant has any unauthorized entry or fire.

If there is a threat to the plant by unauthorized person(s) during regular working hours:

1. Dial 911 for police and notify the Supervisor.
2. Take only reasonable measures to protect other staff from violence and to protect company property from damage, do not endanger yourself.
3. Report all threats to your Supervisor and Health & Safety committee – using Incident Report form found in Appendix B.
4. After-hours security breaches will be redirected from the Alarm Company to SOS Security. SOS staff will attend and contact Standby staff to attend if needed.

4.8 REPORTING A CRIME

If you see or suspect any illegal activity occurring on or around a Regional District of Okanagan-Similkameen facility:

Be aware of the following suspicious signs.

- Call for help.
- Whistle or horn blowing.
- Broken window.
- Unfamiliar person trying to break into a car.
- Unfamiliar person loitering on or about RDOS facilities.

Follow the above procedures if any of them are observed:

1. Contact the RCMP immediately at 9-1-1.
2. Give your name and location and the location and nature of the incident.
3. Do not attempt to interfere with the situation except for self-protection.
4. Fill out incident report (Appendix B). Include a description of any suspects involved. Important characteristics to note are:
 - a. height & weight
 - b. names used
 - c. sex
 - d. age
 - e. race
 - f. tattoos, etc.
5. method & direction of travel
6. Also note a description of any vehicle involved. Important information to note is:
 - g. type of vehicle
 - h. make & model
 - i. colour
 - j. license plate number

4.9 BUILDING EMERGENCY

If you discover building damage that is an immediate hazard:

1. Take reasonable measures to protect employees and yourself from the hazard
2. Report hazard to your Supervisor, including location and description of damage.
3. Fill out incident report located in Appendix B and submit to supervisor.

4.10 EARTHQUAKE PREPAREDNESS

Be aware of the following Dangers:

1. Falling objects (pictures, things in cupboards & shelves, ceiling tiles & fixtures, furniture, file cabinets and bookshelves)
2. Swinging doors and broken windows.
3. Possible fires (from broken natural gas lines, electrical short circuits or other causes).
4. Electrical shock hazards – be aware of potential damage to electrical equipment.

During the Earthquake

1. Take cover underneath a desk or table. Protect your head and neck.
2. Face away from object which could fall on you.
3. Stay where you are – do not run outside. Falling debris may cause injury.
4. If outdoors, stay in an open area. Do not enter a building.

After the Earthquake

1. Wait 60 seconds after shaking stops, then go to predetermined safe area – muster station outside gate.
2. Avoid glass and equipment.
3. Be prepared for aftershocks. Do not return to your area until authorized.
4. DO NOT TRY TO USE THE TELEPHONES (land lines) except to report fires or medical emergencies (even if they do still work, they will be needed for emergency communications).

5. If safe to do so, and when authorized, check the Wastewater treatment plant for any damage and or service interruption. Take corrective action if necessary based on standard operating procedures and process control narrative.
6. If safe to do so, and when authorized, proceed to the lift stations and check for damage and/or service interruption. Take corrective action if necessary based on standard operating procedures and process control narrative.
7. If safe to do so, and when authorized, proceed to each component of the sanitary sewer lines and check for damage and/or service interruption. Take corrective action if necessary based on standard operating procedures and process control narrative.
8. Fill out incident report located in Appendix B and submit to supervisor.
9. Annually participate in the October "BC Shake out" every year

4.11 BOMB THREAT

Persons receiving a BOMB THREAT should:

1. Remain calm.
2. Record the time
3. Record all details of the threat.
4. Try to keep the caller on the line and find out the following :
 - a. Location of the bomb
 - b. The time the bomb is set to go off
 - c. Why the bomb was set
 - d. The type of bomb
 - e. Any other information
5. If still on the phone with the caller have someone else phone 911 and report the details of the threat and await instructions.
6. Evacuate the building/area affected.
7. Immediately contact your supervisor.

8. Fill out incident report found in Appendix B and submit to supervisor.

5 SPILLS RESPONSE – GENERAL INFORMATION & PROCEDURES

Chemical and/or sewage spills can occur within the Okanagan Falls sanitary sewer collection system and at the Wastewater Treatment Facility.

In British Columbia, the *Environmental Management Act* provides regulations regarding spill reporting and hazardous waste definitions. The latest copies of these regulations are provided in Appendix C and D respectively. BC's Spill Reporting Regulations provides a list of substances (Schedule 1 in Appendix C) that if spilled over a specified amount must be reported to the Provincial Emergency Program (PEP) continued under the Emergency Program Act.

The table below summarizes the reportable quantities under the Spill Reporting Regulations for spills that could possibly occur at/ or within the Okanagan Falls sanitary sewer collection system or Wastewater Treatment Facility. A Spill Report, as found in Appendix E, must be completed for any spill greater than the reportable quantities summarized in the table below or as given in Schedule 1 of the Spill Reporting Regulations in Appendix C.

Substance spilled based on Transportation of Dangerous Goods or Hazardous Waste Regulations	Examples of substances	Reportable Quantities
Class 3, Flammable Liquids	Diesel Fuel, Gasoline	100 L
Class 8, Corrosives	Bleach (Sodium Hypochlorite) Alum (Aluminum Sulphate) Solution Caustic (Sodium Hydroxide)	5 kg or 5 L
Class 9, Miscellaneous Products or Organisms	Alum (Aluminum Sulphate) dry	25 kg or 25 L
Waste oil as defined in Section 1 of Hazardous Waste Regulation	Used 15W-40 engine oil in the diesel generator	100 L
A substance, not covered by TDG or Hazardous Waste Regulations that can cause pollution	Polymer for DAF unit Most oils and lubricants Sewage	200 kg or 200 L

5.1 CHEMICAL SPILLS

The WWTP in Okanagan Falls may at any time contain large quantities (up to 2000L), of the following chemicals, but is not limited to this list:

Common Name	Chemical Name	ID Code
Alum	Aluminum Sulphate	UN 2394
PACI	Poly Aluminum	UN N/A
Bleach	Sodium Hypochlorite	UN 1791
Caustic Soda	Sodium Hydroxide Solution	UN 1824
Diesel Fuel	Diesel Fuel	UN 1202

The following steps should be taken for any type of spill:

Refer to MSDS for specific details on spills involving bleach, alum, caustic, diesel, gasoline or waste oil.

1. Consult a Safety Data Sheet for the substance spilled
2. Using appropriate personal protective equipment and if safe to do so, stop the product flow by repositioning containers to minimize leakage or closing valve if applicable.
3. Approach spills upwind of all vapours and avoid walking through spill if possible.
4. For fuel spills, eliminate all avoidable sources of ignition.
5. Contain the spill with commercial sorbents, earth or sand to prevent entry into water ways, ditches, and culvers. Block escape routes, including storm drains.
6. Notify your Supervisor. Notify the Fire Department, Police and Ambulance if necessary. Hazmat dept and environmental contractor (Hazco) for the clean-up?
7. Secure the area and limit or prevent access to the spill of all non-essential or untrained personnel. Consider evacuation of area for larger spills, especially downwind of any hazardous vapours.
8. Use sorbent material to recover product or vacuum up or pump to appropriate storage device for large quantities of pooled product.
9. Do not use vacuum trucks to recover spilled gasoline or acid solutions.

10. Collect used sorbent material using no-sparking tools and place in leak-proof containers. Store in a well ventilated secure location away from heat sources.
11. Complete a Spill Incident Report form (Appendix E). If the spill is of a reportable quantity (Schedule 1, Spill Reporting Regulations in Appendix C) the Provincial Emergency Program needs to be notified by the Public Works Manager as given in Section Environmental and Regulatory Notification Procedure.

5.2 SEWAGE SPILLS

Domestic sewage is not considered a hazardous waste, nor is human urine or feces considered a biomedical waste as interpreted by Hazardous Waste Regulations, Part 1 – Interpretation and Application (Appendix D). However, spills of untreated sewage or inadequately treated sewage have the potential to cause pollution, especially in public areas or near waterways. Therefore spills greater than 200 kg or 200 L are regulated by the Spill Reporting Regulations as per Schedule 1 in Appendix D.

In addition, refer to Appendix E: The Ministry of Environment – **Facts on Contaminated Sites** (June 2009) Remediation of Sites contaminated by a spill.

Sewage Spill Cleanup Procedure:

1. Wear protective clothing, rubber or latex gloves rubber boots and coveralls, when cleaning up a sewage spill.
2. Contain sewage spills with sorbent materials, earth or other non-combustible materials
3. Prevent the sewage from flowing into waterways, or storm drain manholes.
4. Restrict public access to the contaminated areas by clearly marking or cordon off the area.
5. Clean up spill using hand tools, wet vacuums or a vacuum/pump truck depending on size of spill.
6. Dispose of recovered sewage into the sanitary sewer system or at the Wastewater Treatment plant, being carefully not dump rocks or other large debris into the collection or wastewater treatment systems.
7. Once the area is visibly clean, disinfect the area using either a 5% chlorine solution (approx. 250 mL in 4 L water) or hydrated lime if the spill occurred in an area where

odours may be an issue or within 30 meters of surface water. Enough hydrated lime should be applied to raise the pH to 12 or greater for at least an hour to disinfect the area. Litmus paper can be used to test the pH of the treated area.

8. Restrict access during the disinfection period.
9. If the sewage spill is near any public or private drinking water intakes i.e. Vaseux Lake Interior Health must be notified as well – see contact book for information.

6 SEWER EMERGENCY SITUATIONS

The following section is a summary of response procedures for selected emergency situations or conditions pertaining to the sewer system. This is by no means exhaustive, and will be expanded and revised periodically or as the need arises.

6.1 SEWER MAIN BLOCKAGE/BACKUP

A map of the sanitary sewer lines and manholes within the Okanagan Falls Wastewater Collection System is Located in Appendix G. The sewer lines along the East Side of Skaha Lake are below the water level of the lake. There are also sewer collection lines beside Shuttleworth Creek and near Okanagan River. A blockage of a sewer main line or failure of a Lift Station may cause the main to back up and possibly cause flooding and/or leaking of raw sewage into a waterway and/or onto surrounding properties. Some residences within Okanagan Falls may have shallow wells for their potable water supply, while others get their drinking water from either Skaha Estates Irrigation District, Kaleden Irrigation District, Okanagan Falls Irrigation District or Lakeshore Highlands Water.

Objective: Prevent flooding, property damage and contamination of surface waters.

Response Action	Responsibility
1 Assess the situation with priority to contain or control the flow of sewage as quickly as possible. If flooding is extensive, prevent sewage from entering storm drainage by blocking curb and/or road drains.	First Operator at scene.
2 Contact Utilities Foreman or designate and/or Public Works Manager. Refer to RDOS's Emergency Contact List in Appendix A for phone numbers. Provide them with information as to location, extent and impact of the blockage to the immediate surroundings.	First Operator at scene
3 Contact Emergency Management BC (EMBC), Interior Health Authority (IHA) and Report all Poachers and Polluters (R.A.P.P.). Provide them with information as to location, extent and impact of the blockage to the immediate surroundings. Refer to RDOS's Emergency Contact List in Appendix A for phone numbers.	Utilities Foreman
4 Record required information on Spill Action Report form in Appendix E.	Utilities Foreman
5 Employ a sewer cleaning truck to remove the sewage and any clean up required. Contact numbers for Septic Services can be found RDOS's Emergency Contact List in Appendix A.	Utilities Foreman
6 For spills into Skaha Lake, contact any water purveyors which have water intakes at the south end of Skaha Lake. These include Skaha Estates, Kaleden Irrigation District and Lakeshore Highlands. Contact Information can be found in Appendix A.	Utilities Foreman
7 Contact surrounding residences for possible damage to sewer service connections and/or issue boil water notices if the residences have shallow wells near the spill location.	Utilities Foreman
8 Sample surface waters and/or drinking water of residences as soon as possible as per Sampling Protocol provided in Appendix F by Larratt Aquatics	WWTP Laboratory Technician

6.2 GRAVITY MAIN BREAK

In the event of a sewer break, contact Utilities Foreman and begin co-ordination of excavator and Vacuum truck companies.

- Reference Emergency Contacts for Septic Services and Earth Material Contractors.
- Ensure that BC One is contacted for locates.
- Ensure proper PPE is used during the excavation.
- Ensure all OHS regulations are followed (ie. fall arrest, confined space, shoring etc.)

If the main break requires traffic interruption, contact Traffic Control Services – reference Emergency Contacts Document.

6.3 FORCE MAIN BREAK

In the event of a force main break, contact Utilities Foreman and begin co-ordination of excavator and Vacuum truck companies.

If there is an obvious overflow to the environment or property – locate the upper valve and begin to isolate the break. Set diversions if possible utilizing portable sump pumps.

- Reference Emergency Contacts for Septic Services and Earth Material Contractors.
- Ensure that BC One is contacted for locates.
- Ensure proper PPE is used during the excavation.
- Ensure all OHS regulations are followed (i.e. fall arrest, confined space, shoring etc.)

If the main break requires traffic interruption, contact Traffic Control Services – reference Emergency Contacts Document.

6.4 ODOUR COMPLAINTS

Investigate and report all odour complaints. Under the Environmental regulations “Law of Nuisances” there is an onus on municipalities to limit the amount of impact any activity has on others including odour from sewage activities or equipment.

When answering any calls for odour complaints, be courteous and professional. Take down the information from the caller including:

- Name, address and telephone number
- Where the odour seems to be emanating from
- Description of the odour

Contact Utilities foreman - Wastewater. Attend to the area of the odour complaint and make observations. If possible mitigate the issue and document such in the log book.

6.5 Polishing Wetland High Level

The operating level of the wetland is 328.3 m. In the event of heavy rainfall or blockage of the wetland discharge pipe, the wetland is designed for a emergency spillway at the natural draw located south of the wetland to the Okanagan River if the level of the wetland exceeds 328.7 m in elevation. At this time, the inlet valve to the wetland will be closed so that no effluent is added. The level will be reduced via the sand filter or the pumped from the wetland to the spill way.

Reporting protocol will the be same as for any spill.

6.6 COMMUNICATIONS FAILURE (SCADA)

POSSIBLE CAUSES:

- Radio/Cellular or internet issues

ACTIONS:

- Investigate at site and/or contact Carrier and RDOS IS department

CONTACTS:

- **Utilities Foreman – Wastewater**
- **On Call Operator**

6.7 CONTROL SYSTEM FAILURE

POSSIBLE CAUSES:

- Programmable Logic Controller (PLC) failure.

ACTIONS:

- Investigate at Site
- OKFWWTP may have to be manually operated until PLC is repaired

CONTACTS:

- **Utilities Foreman - Wastewater**
- **On Call Operator**

APPENDIX A

RDOS CONTACT BOOKLET

APPENDIX B

RDOS INCIDENT REPORT

Incident Report

Regional Staff Reporting or Receiving Report of a Spill:

Name:	Date:	Time:
Telephone:	Cell Phone:	
Email:	Who caused spill:	

Person Reporting Spill (if other than Regional Staff)

Name:	Telephone:
Address:	Cell Phone:
Postal Code:	Email:

Reported to Regional Staff Public Works Manager

Name:	Date:	Time:
Telephone:	Method (Phone, Voicemail, Email, etc)	
Cell Phone:	Email:	

Incident Details

Location: _____

Date and Time spill started: _____ Date and Time spill ended: _____

Type of spill (i.e. oil, sewage, bleach, etc.): _____

For chemical spills, obtain MSDS if possible: _____ Quantity of substance spilled: _____

Is the spill a reportable quantity under BC's Spill Reporting Regulation M329 (Appendix C) Y/N

Substance spilled based on Transportation of Dangerous Goods or Hazardous Waste Regulations	Examples of substances	Reportable Quantities
Class 3, Flammable Liquids	Diesel Fuel, Gasoline	100 L
Class 8, Corrosives	Bleach (> 8% Sodium Hypochlorite) Alum (Aluminum Sulphate) Solution Caustic (Sodium Hydroxide)	5 kg or 5 L
Class 9, Miscellaneous Products or Organisms	Alum (Aluminum Sulphate) dry	25 kg or 25 L
Waste oil as defined in Section 1 of Hazardous Waste Regulation	Used 15W-40 engine oil in the diesel generator	100 L
A substance, not covered by TDG or Hazardous Waste Regulations that can cause pollution	Polymer for DAF unit Sewage	200 kg or 200 L

Incident Details Continued

Discharged to Environment? Yes No

Discharged to Secondary Containment? Yes No

Cause and effect of the spill:

Action taken to control spill:

Description of spill location and area surrounding spill (use a separate sheet, or attach maps or pictures if required).

Any further actions required or contemplated?

Were any samples taken? Provide dates, times, locations and parameters sampled for. Or provide a copy of Chain of Custody Sheet. Attach data or laboratory results to this report once completed.

Final Resolution:

Operator Signature:

Date:

Incident Report - Agencies contacted

Ministry of Environment (MOE) – you must talk to a live person

Name of Person talked to: _____ Date and Time: _____

Action requested to be taken by MOE: _____

Did this Agency arrive on scene?: _____

Incident #

Interior Health Authority (IHA) – you must talk to a live person

Name of Person talked to: _____ Date and Time: _____

Action requested to be taken by MOE: _____

Did this Agency arrive on scene? _____

Incident #

Report All Poachers and Polluters

Name of Person talked to: _____ Date and Time: _____

Action requested to be taken by MOE: _____

Did this Agency arrive on scene? _____

Incident Report - Agencies contacted

Any Other Agencies contacted or Arrived on Scene?

Name of Person talked to: _____ Date and Time: _____

Action requested to be taken by MOE: _____

Did this Agency arrive on scene? _____

Any Other Agencies contacted or Arrived on Scene?

Name of Person talked to: _____ Date and Time: _____

Action requested to be taken by MOE: _____

Did this Agency arrive on scene? _____

Any Other Agencies contacted or Arrived on Scene?

Name of Person talked to: _____ Date and Time: _____

Action requested to be taken by MOE: _____

Did this Agency arrive on scene? _____

APPENDIX C

SPILL REPORTING REGULATION

(BC ENVIRONMENTAL MANAGEMENT ACT)

APPENDIX D

HAZARDOUS WASTE REGULATION

(*BC ENVIRONMENTAL MANAGEMENT ACT*)

PART 1

APPLICATION AND INTERPRETATION AND

WASTEWATER SECTION SPILL INCIDENT

REPORT

APPENDIX E

SPILL REPORT FORM

APPENDIX F

**SAMPLING PROTOCOL FOR COLLECTION
SYSTEM SPILLS**

APPENDIX G
MAP OKANGAN FALLS
SANITARY SYSTEM