CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Thompson Nicola 300 - 465 Victoria Street Kamloops, BC V2C 2A9	**TEL** **FAX**	(250) 377-6284 (250) 374-6489
ATTENTION	Shawn Kratchmer	**WORK ORDER**	6120678
PO NUMBER		**RECEIVED / TEMP**	2016-12-09 09:00 / 7°C
PROJECT	Black Pines CWS	**REPORTED**	2016-12-16
PROJECT INFO		**COC NUMBER**	B 49226

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition 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 unless otherwise agreed to in writing.

Authorized By: **Ed Hoppe, B.Sc., P.Chem.**
Division Manager, Kelowna

If you have any questions or concerns, please contact your Account Manager:
Jennifer Shanko, AScT (jshanko@caro.ca)

Locations:

#110 4011 Viking Way
Richmond, BC V6V 2K9
Tel: 604-279-1499 Fax: 604-279-1599

#102 3677 Highway 97N
Kelowna, BC V1X 5C3
Tel: 250-765-9646 Fax: 250-765-3893

17225 109 Avenue
Edmonton, AB T5S 1H7
Tel: 780-489-9100 Fax: 780-489-9700

www.caro.ca

ANALYSIS INFORMATION

REPORTED TO	Regional District of Thompson Nicola	**WORK ORDER**	6120678
PROJECT	Black Pines CWS	**REPORTED**	2016-12-16

Analysis Description	Method Reference	Technique	Location
Alkalinity in Water	APHA 2320 B*	Titration with H2SO4	Kelowna
Ammonia, Total in Water	APHA 4500-NH3 G*	Automated Colorimetry (Phenate)	Kelowna
Anions by IC in Water	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Colour, True in Water	APHA 2120 C	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Dissolved Metals by ICPMS in Water	APHA 3030 B / APHA 3125 B	0.45 µm Filtration / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Hardness (as CaCO3) in Water	APHA 2340 B	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	N/A
Hardness (as CaCO3) in Water	APHA 2340 B*	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Estimated)	N/A
Mercury, dissolved by CVAFS in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Mercury, total by CVAFS in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Solids, Total Dissolved in Water	APHA 2540 C*	Gravimetry (Dried at 103-105C)	Kelowna
Total Metals by ICPMS in Water	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Transmissivity at 254 nm in Water	APHA 5910 B*	Ultraviolet Absorption	Kelowna
Trihalomethanes in Water	EPA 5030B / APHA 6200 B	Purge&Trap / Purge and Trap Capillary Column GC-MSD	Richmond

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

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation
EPA	United States Environmental Protection Agency Test Methods

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
AO	Aesthetic objective
MAC	Maximum acceptable concentration (health based)
OG	Operational guideline (treated water)
% T	Percent Transmittance
CU	Colour Units (referenced against a platinum cobalt standard)
mg/L	Milligrams per litre
µS/cm	Microsiemens per centimetre

Standards / Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Oct 2014)

Website: http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user

CARO ANALYTICAL SERVICES

SAMPLE ANALYTICAL DATA

REPORTED TO Regional District of Thompson Nicola
PROJECT Black Pines CWS

WORK ORDER 6120678
REPORTED 2016-12-16

Analyte	Result / *Recovery*	Standard / Guideline	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Black Pines CWS (6120678-01) [Water] Sampled: 2016-12-08 10:30							F1
Anions							
Chloride	**8.34**	AO ≤ 250	0.10	mg/L	N/A	2016-12-11	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	N/A	2016-12-11	
Nitrate (as N)	**0.100**	MAC = 10	0.010	mg/L	N/A	2016-12-11	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2016-12-11	
Sulfate	**6.3**	AO ≤ 500	1.0	mg/L	N/A	2016-12-11	
General Parameters							
Alkalinity, Total (as CaCO3)	**39**	N/A	2	mg/L	N/A	2016-12-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1	N/A	2	mg/L	N/A	2016-12-13	
Alkalinity, Bicarbonate (as CaCO3)	**39**	N/A	2	mg/L	N/A	2016-12-13	
Alkalinity, Carbonate (as CaCO3)	< 1	N/A	2	mg/L	N/A	2016-12-13	
Alkalinity, Hydroxide (as CaCO3)	< 1	N/A	2	mg/L	N/A	2016-12-13	
Ammonia, Total (as N)	**0.026**	N/A	0.020	mg/L	N/A	2016-12-10	
Colour, True	< 5	AO ≤ 15	5	CU	N/A	2016-12-09	
Conductivity (EC)	**122**	N/A	2	µS/cm	N/A	2016-12-13	
Solids, Total Dissolved	**84**	AO ≤ 500	10	mg/L	N/A	2016-12-12	
UV Transmittance @ 254nm	**89.6**	N/A	0.1	% T	N/A	2016-12-09	
Calculated Parameters							
Total Trihalomethanes	**0.106**	MAC = 0.1	0.004	mg/L	N/A	N/A	
Hardness, Total (as CaCO3)	**39.9**	N/A	0.50	mg/L	N/A	N/A	
Nitrate+Nitrite (as N)	**0.100**	N/A	0.020	mg/L	N/A	N/A	
Dissolved Metals							
Aluminum, dissolved	**0.018**	N/A	0.005	mg/L	N/A	2016-12-14	
Antimony, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Arsenic, dissolved	< 0.0005	N/A	0.0005	mg/L	N/A	2016-12-14	
Barium, dissolved	**0.006**	N/A	0.005	mg/L	N/A	2016-12-14	
Beryllium, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Bismuth, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Boron, dissolved	< 0.004	N/A	0.004	mg/L	N/A	2016-12-14	
Cadmium, dissolved	< 0.00001	N/A	0.00001	mg/L	N/A	2016-12-14	
Calcium, dissolved	**12.5**	N/A	0.2	mg/L	N/A	2016-12-14	
Chromium, dissolved	< 0.0005	N/A	0.0005	mg/L	N/A	2016-12-14	
Cobalt, dissolved	< 0.00005	N/A	0.00005	mg/L	N/A	2016-12-14	
Copper, dissolved	**0.0030**	N/A	0.0002	mg/L	N/A	2016-12-14	
Iron, dissolved	**0.050**	N/A	0.010	mg/L	N/A	2016-12-14	
Lead, dissolved	**0.0002**	N/A	0.0001	mg/L	N/A	2016-12-14	
Lithium, dissolved	**0.0009**	N/A	0.0001	mg/L	N/A	2016-12-14	
Magnesium, dissolved	**2.09**	N/A	0.01	mg/L	N/A	2016-12-14	
Manganese, dissolved	**0.0012**	N/A	0.0002	mg/L	N/A	2016-12-14	
Mercury, dissolved	< 0.00002	N/A	0.00002	mg/L	2016-12-14	2016-12-14	
Molybdenum, dissolved	**0.0010**	N/A	0.0001	mg/L	N/A	2016-12-14	
Nickel, dissolved	**0.0004**	N/A	0.0002	mg/L	N/A	2016-12-14	
Phosphorus, dissolved	< 0.02	N/A	0.02	mg/L	N/A	2016-12-14	
Potassium, dissolved	**0.82**	N/A	0.02	mg/L	N/A	2016-12-14	
Selenium, dissolved	< 0.0005	N/A	0.0005	mg/L	N/A	2016-12-14	

REPORTED TO Regional District of Thompson Nicola
PROJECT Black Pines CWS

WORK ORDER 6120678
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Analyte	Result / *Recovery*	Standard / Guideline	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Black Pines CWS (6120678-01) [Water] Sampled: 2016-12-08 10:30, Continued							F1
Dissolved Metals, Continued							
Silicon, dissolved	**3.0**	N/A	0.5	mg/L	N/A	2016-12-14	
Silver, dissolved	< 0.00005	N/A	0.00005	mg/L	N/A	2016-12-14	
Sodium, dissolved	**7.75**	N/A	0.02	mg/L	N/A	2016-12-14	
Strontium, dissolved	**0.071**	N/A	0.001	mg/L	N/A	2016-12-14	
Sulfur, dissolved	< 1	N/A	1	mg/L	N/A	2016-12-14	
Tellurium, dissolved	< 0.0002	N/A	0.0002	mg/L	N/A	2016-12-14	
Thallium, dissolved	< 0.00002	N/A	0.00002	mg/L	N/A	2016-12-14	
Thorium, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Tin, dissolved	< 0.0002	N/A	0.0002	mg/L	N/A	2016-12-14	
Titanium, dissolved	< 0.005	N/A	0.005	mg/L	N/A	2016-12-14	
Uranium, dissolved	**0.00035**	N/A	0.00002	mg/L	N/A	2016-12-14	
Vanadium, dissolved	< 0.001	N/A	0.001	mg/L	N/A	2016-12-14	
Zinc, dissolved	**0.018**	N/A	0.004	mg/L	N/A	2016-12-14	
Zirconium, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Total Metals							
Aluminum, total	**0.050**	OG < 0.1	0.005	mg/L	2016-12-14	2016-12-15	
Antimony, total	< 0.0001	MAC = 0.006	0.0001	mg/L	2016-12-14	2016-12-15	
Arsenic, total	< 0.0005	MAC = 0.01	0.0005	mg/L	2016-12-14	2016-12-15	
Barium, total	**0.008**	MAC = 1	0.005	mg/L	2016-12-14	2016-12-15	
Beryllium, total	< 0.0001	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Bismuth, total	< 0.0001	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Boron, total	**0.004**	MAC = 5	0.004	mg/L	2016-12-14	2016-12-15	
Cadmium, total	< 0.00001	MAC = 0.005	0.00001	mg/L	2016-12-14	2016-12-15	
Calcium, total	**12.4**	N/A	0.2	mg/L	2016-12-14	2016-12-15	
Chromium, total	**0.0019**	MAC = 0.05	0.0005	mg/L	2016-12-14	2016-12-15	
Cobalt, total	**0.00006**	N/A	0.00005	mg/L	2016-12-14	2016-12-15	
Copper, total	**0.0033**	AO ≤ 1	0.0002	mg/L	2016-12-14	2016-12-15	
Iron, total	**0.11**	AO ≤ 0.3	0.01	mg/L	2016-12-14	2016-12-15	
Lead, total	**0.0002**	MAC = 0.01	0.0001	mg/L	2016-12-14	2016-12-15	
Lithium, total	**0.0009**	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Magnesium, total	**2.32**	N/A	0.01	mg/L	2016-12-14	2016-12-15	
Manganese, total	**0.0038**	AO ≤ 0.05	0.0002	mg/L	2016-12-14	2016-12-15	
Mercury, total	< 0.00002	MAC = 0.001	0.00002	mg/L	2016-12-14	2016-12-14	
Molybdenum, total	**0.0010**	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Nickel, total	**0.0017**	N/A	0.0002	mg/L	2016-12-14	2016-12-15	
Phosphorus, total	< 0.02	N/A	0.02	mg/L	2016-12-14	2016-12-15	
Potassium, total	**0.92**	N/A	0.02	mg/L	2016-12-14	2016-12-15	
Selenium, total	< 0.0005	MAC = 0.05	0.0005	mg/L	2016-12-14	2016-12-15	
Silicon, total	**3.1**	N/A	0.5	mg/L	2016-12-14	2016-12-15	
Silver, total	< 0.00005	N/A	0.00005	mg/L	2016-12-14	2016-12-15	
Sodium, total	**8.41**	AO ≤ 200	0.02	mg/L	2016-12-14	2016-12-15	
Strontium, total	**0.083**	N/A	0.001	mg/L	2016-12-14	2016-12-15	
Sulfur, total	**2**	N/A	1	mg/L	2016-12-14	2016-12-15	
Tellurium, total	< 0.0002	N/A	0.0002	mg/L	2016-12-14	2016-12-15	
Thallium, total	< 0.00002	N/A	0.00002	mg/L	2016-12-14	2016-12-15	

REPORTED TO	Regional District of Thompson Nicola	**WORK ORDER**	6120678
PROJECT	Black Pines CWS	**REPORTED**	2016-12-16

Analyte	Result / *Recovery*	Standard / Guideline	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Black Pines CWS (6120678-01) [Water] Sampled: 2016-12-08 10:30, Continued							F1
Total Metals, Continued							
Thorium, total	< 0.0001	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Tin, total	< 0.0002	N/A	0.0002	mg/L	2016-12-14	2016-12-15	
Titanium, total	< 0.005	N/A	0.005	mg/L	2016-12-14	2016-12-15	
Uranium, total	**0.00036**	MAC = 0.02	0.00002	mg/L	2016-12-14	2016-12-15	
Vanadium, total	< 0.001	N/A	0.001	mg/L	2016-12-14	2016-12-15	
Zinc, total	**0.010**	AO ≤ 5	0.004	mg/L	2016-12-14	2016-12-15	
Zirconium, total	< 0.0001	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Volatile Organic Compounds (VOC)							
Bromodichloromethane	< 0.001	N/A	0.001	mg/L	N/A	2016-12-15	
Bromoform	< 0.001	N/A	0.001	mg/L	N/A	2016-12-15	
Chloroform	**0.106**	N/A	0.001	mg/L	N/A	2016-12-15	
Dibromochloromethane	< 0.001	N/A	0.001	mg/L	N/A	2016-12-15	
Surrogate: Toluene-d8	*120*		*70-130*	%	*N/A*	*2016-12-15*	
Surrogate: 4-Bromofluorobenzene	*117*		*70-130*	%	*N/A*	*2016-12-15*	

Sample / Analysis Qualifiers:

F1 The sample was not field-filtered and was therefore filtered through a 0.45 µm membrane in the laboratory and preserved with HNO3 prior to analysis for dissolved metals.